

# Computer algebra independent integration tests

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

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3.130	$\int (ci + dix)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx$	. . . . .	1195
3.131	$\int \frac{(ci+dx)^3 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{ag+bgx} dx$	. . . . .	1200
3.132	$\int \frac{(ci+dx)^3 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ag+bgx)^2} dx$	. . . . .	1207
3.133	$\int \frac{(ci+dx)^3 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ag+bgx)^3} dx$	. . . . .	1214
3.134	$\int \frac{(ci+dx)^3 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ag+bgx)^4} dx$	. . . . .	1222
3.135	$\int \frac{(ag+bgx)^3 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{ci+dix} dx$	. . . . .	1229
3.136	$\int \frac{(ag+bgx)^2 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{ci+dix} dx$	. . . . .	1236
3.137	$\int \frac{(ag+bgx) \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{ci+dix} dx$	. . . . .	1243
3.138	$\int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{ci+dix} dx$	. . . . .	1249
3.139	$\int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{(ag+bgx)(ci+dix)} dx$	. . . . .	1254
3.140	$\int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{(ag+bgx)^2(ci+dix)} dx$	. . . . .	1259
3.141	$\int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{(ag+bgx)^3(ci+dix)} dx$	. . . . .	1266
3.142	$\int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{(ag+bgx)^4(ci+dix)} dx$	. . . . .	1273
3.143	$\int \frac{(ag+bgx)^3 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ci+dix)^2} dx$	. . . . .	1280
3.144	$\int \frac{(ag+bgx)^2 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ci+dix)^2} dx$	. . . . .	1287
3.145	$\int \frac{(ag+bgx) \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ci+dix)^2} dx$	. . . . .	1294
3.146	$\int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{(ci+dix)^2} dx$	. . . . .	1300
3.147	$\int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{(ag+bgx)(ci+dix)^2} dx$	. . . . .	1304
3.148	$\int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{(ag+bgx)^2(ci+dix)^2} dx$	. . . . .	1311



3.149	$\int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^3(ci+dix)^2} dx$	1318
3.150	$\int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^4(ci+dix)^2} dx$	1326
3.151	$\int \frac{(ag+bgx)^3\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ci+dix)^3} dx$	1334
3.152	$\int \frac{(ag+bgx)^2\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ci+dix)^3} dx$	1342
3.153	$\int \frac{(ag+bgx)\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ci+dix)^3} dx$	1349
3.154	$\int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ci+dix)^3} dx$	1354
3.155	$\int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)(ci+dix)^3} dx$	1358
3.156	$\int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^2(ci+dix)^3} dx$	1365
3.157	$\int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^3(ci+dix)^3} dx$	1373
3.158	$\int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^4(ci+dix)^3} dx$	1381
3.159	$\int (ag+bgx)^3(ci+dix)\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$	1390
3.160	$\int (ag+bgx)^2(ci+dix)\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$	1400
3.161	$\int (ag+bgx)(ci+dix)\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$	1409
3.162	$\int (ci+dix)\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$	1418
3.163	$\int \frac{(ci+dix)\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ag+bgx} dx$	1425
3.164	$\int \frac{(ci+dix)\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^2} dx$	1434
3.165	$\int \frac{(ci+dix)\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^3} dx$	1444
3.166	$\int \frac{(ci+dix)\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^4} dx$	1452

- 3.167  $\int \frac{(ci+dix)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^5} dx \dots\dots\dots .1461$
- 3.168  $\int (ag+bgx)^3(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx \dots\dots\dots .1471$
- 3.169  $\int (ag+bgx)^2(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx \dots\dots\dots .1482$
- 3.170  $\int (ag+bgx)(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx \dots\dots\dots .1492$
- 3.171  $\int (ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx \dots\dots\dots .1501$
- 3.172  $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ag+bgx} dx \dots\dots\dots .1508$
- 3.173  $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^2} dx \dots\dots\dots .1520$
- 3.174  $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^3} dx \dots\dots\dots .1531$
- 3.175  $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^4} dx \dots\dots\dots .1543$
- 3.176  $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^5} dx \dots\dots\dots .1553$
- 3.177  $\int \frac{(ci+dix)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^6} dx \dots\dots\dots .1565$
- 3.178  $\int (ag+bgx)^3(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx \dots\dots\dots .1580$
- 3.179  $\int (ag+bgx)^2(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx \dots\dots\dots .1592$
- 3.180  $\int (ag+bgx)(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx \dots\dots\dots .1603$
- 3.181  $\int (ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx \dots\dots\dots .1613$
- 3.182  $\int \frac{(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ag+bgx} dx \dots\dots\dots .1621$
- 3.183  $\int \frac{(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^2} dx \dots\dots\dots .1634$
- 3.184  $\int \frac{(ci+dix)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^3} dx \dots\dots\dots .1647$

3.185	$\int \frac{(ci+dix)^3 \left( A+B \log \left( e^{\left( \frac{a+bx}{c+dx} \right)^n} \right) \right)^2}{(ag+bgx)^4} dx$	.1657
3.186	$\int \frac{(ag+bgx)^3 \left( A+B \log \left( e^{\left( \frac{a+bx}{c+dx} \right)^n} \right) \right)^2}{ci+dix} dx$	.1667
3.187	$\int \frac{(ag+bgx)^2 \left( A+B \log \left( e^{\left( \frac{a+bx}{c+dx} \right)^n} \right) \right)^2}{ci+dix} dx$	.1680
3.188	$\int \frac{(ag+bgx) \left( A+B \log \left( e^{\left( \frac{a+bx}{c+dx} \right)^n} \right) \right)^2}{ci+dix} dx$	.1692
3.189	$\int \frac{\left( A+B \log \left( e^{\left( \frac{a+bx}{c+dx} \right)^n} \right) \right)^2}{ci+dix} dx$	.1702
3.190	$\int \frac{\left( A+B \log \left( e^{\left( \frac{a+bx}{c+dx} \right)^n} \right) \right)^2}{(ag+bgx)(ci+dix)} dx$	.1711
3.191	$\int \frac{\left( A+B \log \left( e^{\left( \frac{a+bx}{c+dx} \right)^n} \right) \right)^2}{(ag+bgx)^2(ci+dix)} dx$	.1722
3.192	$\int \frac{\left( A+B \log \left( e^{\left( \frac{a+bx}{c+dx} \right)^n} \right) \right)^2}{(ag+bgx)^3(ci+dix)} dx$	.1733
3.193	$\int \frac{\left( A+B \log \left( e^{\left( \frac{a+bx}{c+dx} \right)^n} \right) \right)^2}{(ag+bgx)^4(ci+dix)} dx$	.1745
3.194	$\int \frac{(ag+bgx)^3 \left( A+B \log \left( e^{\left( \frac{a+bx}{c+dx} \right)^n} \right) \right)^2}{(ci+dix)^2} dx$	.1759
3.195	$\int \frac{(ag+bgx)^2 \left( A+B \log \left( e^{\left( \frac{a+bx}{c+dx} \right)^n} \right) \right)^2}{(ci+dix)^2} dx$	.1772
3.196	$\int \frac{(ag+bgx) \left( A+B \log \left( e^{\left( \frac{a+bx}{c+dx} \right)^n} \right) \right)^2}{(ci+dix)^2} dx$	.1783
3.197	$\int \frac{\left( A+B \log \left( e^{\left( \frac{a+bx}{c+dx} \right)^n} \right) \right)^2}{(ci+dix)^2} dx$	.1793
3.198	$\int \frac{\left( A+B \log \left( e^{\left( \frac{a+bx}{c+dx} \right)^n} \right) \right)^2}{(ag+bgx)(ci+dix)^2} dx$	.1800
3.199	$\int \frac{\left( A+B \log \left( e^{\left( \frac{a+bx}{c+dx} \right)^n} \right) \right)^2}{(ag+bgx)^2(ci+dix)^2} dx$	.1811
3.200	$\int \frac{\left( A+B \log \left( e^{\left( \frac{a+bx}{c+dx} \right)^n} \right) \right)^2}{(ag+bgx)^3(ci+dix)^2} dx$	.1823
3.201	$\int \frac{\left( A+B \log \left( e^{\left( \frac{a+bx}{c+dx} \right)^n} \right) \right)^2}{(ag+bgx)^4(ci+dix)^2} dx$	.1838

- 3.202  $\int \frac{(ag+bgx)^3 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ci+dx)^3} dx \dots\dots\dots .1853$
- 3.203  $\int \frac{(ag+bgx)^2 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ci+dx)^3} dx \dots\dots\dots .1864$
- 3.204  $\int \frac{(ag+bgx) \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ci+dx)^3} dx \dots\dots\dots .1876$
- 3.205  $\int \frac{\left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ci+dx)^3} dx \dots\dots\dots .1884$
- 3.206  $\int \frac{\left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ag+bgx)(ci+dx)^3} dx \dots\dots\dots .1891$
- 3.207  $\int \frac{\left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ag+bgx)^2(ci+dx)^3} dx \dots\dots\dots .1903$
- 3.208  $\int \frac{\left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ag+bgx)^3(ci+dx)^3} dx \dots\dots\dots .1918$
- 3.209  $\int \frac{\left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ag+bgx)^4(ci+dx)^3} dx \dots\dots\dots .1934$
- 3.210  $\int (ag + bgx)^m (ci + dix)^{-2-m} \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^p dx \dots\dots\dots .1951$
- 3.211  $\int (ag + bgx)^{-2-m} (ci + dix)^m \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^p dx \dots\dots\dots .1954$
- 3.212  $\int (ag + bgx)^m (ci + dix)^{-2-m} \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^3 dx \dots\dots\dots .1957$
- 3.213  $\int (ag + bgx)^m (ci + dix)^{-2-m} \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx \dots\dots\dots .1962$
- 3.214  $\int (ag + bgx)^m (ci + dix)^{-2-m} \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx \dots\dots\dots .1966$
- 3.215  $\int \frac{(ag+bgx)^m (ci+dx)^{-2-m}}{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)} dx \dots\dots\dots .1970$
- 3.216  $\int \frac{(ag+bgx)^m (ci+dx)^{-2-m}}{\left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2} dx \dots\dots\dots .1974$
- 3.217  $\int \frac{(ag+bgx)^m (ci+dx)^{-2-m}}{\left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^3} dx \dots\dots\dots .1978$
- 3.218  $\int (ag + bgx)^{-2-m} (ci + dix)^m \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^3 dx \dots\dots\dots .1983$
- 3.219  $\int (ag + bgx)^{-2-m} (ci + dix)^m \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx \dots\dots\dots .1988$
- 3.220  $\int (ag + bgx)^{-2-m} (ci + dix)^m \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx \dots\dots\dots .1992$

3.221	$\int \frac{(ag+bgx)^{-2-m}(ci+dir)^m}{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx \dots\dots\dots$	1996
3.222	$\int \frac{(ag+bgx)^{-2-m}(ci+dir)^m}{\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2} dx \dots\dots\dots$	2000
3.223	$\int \frac{(ag+bgx)^{-2-m}(ci+dir)^m}{\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3} dx \dots\dots\dots$	2004
3.224	$\int \frac{\log^p\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)(c+dx)} dx \dots\dots\dots$	2009
3.225	$\int \frac{\log^p\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{ac+(bc+ad)x+bdx^2} dx \dots\dots\dots$	2012
3.226	$\int (ag+bgx)^m (ci+dir)^{-2-m} (A+B \log(e(a+bx)^n(c+dx)^{-n}))^p dx \dots\dots\dots$	2015
3.227	$\int (ag+bgx)^{-2-m} (ci+dir)^m (A+B \log(e(a+bx)^n(c+dx)^{-n}))^p dx \dots\dots\dots$	2018
3.228	$\int \frac{(A+B \log(e(a+bx)^n(c+dx)^{-n}))^3}{(a+bx)(c+dx)} dx \dots\dots\dots$	2021
3.229	$\int \frac{(A+B \log(e(a+bx)^n(c+dx)^{-n}))^2}{(a+bx)(c+dx)} dx \dots\dots\dots$	2025
3.230	$\int \frac{A+B \log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)(c+dx)} dx \dots\dots\dots$	2028
3.231	$\int \frac{1}{(a+bx)(c+dx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))} dx \dots\dots\dots$	2032
3.232	$\int \frac{1}{(a+bx)(c+dx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))^2} dx \dots\dots\dots$	2035
3.233	$\int \frac{1}{(a+bx)(c+dx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))^3} dx \dots\dots\dots$	2038
3.234	$\int \frac{(A+B \log(e(a+bx)^n(c+dx)^{-n}))^p}{(a+bx)(c+dx)} dx \dots\dots\dots$	2042
3.235	$\int \frac{(A+B \log(e(a+bx)^n(c+dx)^{-n}))^p}{(af+bfx)(cg+dgx)} dx \dots\dots\dots$	2045
3.236	$\int \frac{(A+B \log(e(a+bx)^n(c+dx)^{-n}))^p}{acf+(bc+ad)fx+bdfx^2} dx \dots\dots\dots$	2048
3.237	$\int \frac{1}{(a+bx)(c+dx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))} dx \dots\dots\dots$	2051
3.238	$\int \frac{1}{(af+bfx)(cg+dgx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))} dx \dots\dots\dots$	2054
3.239	$\int \frac{1}{(acf+(bc+ad)fx+bdfx^2)(A+B \log(e(a+bx)^n(c+dx)^{-n}))} dx \dots\dots\dots$	2057
3.240	$\int \frac{(a+bx)^m(c+dx)^{-2-m}}{\log(e(a+bx)^n(c+dx)^{-n})} dx \dots\dots\dots$	2060
3.241	$\int \frac{(a+bx)^3}{(c+dx)^5 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx \dots\dots\dots$	2064
3.242	$\int \frac{(a+bx)^2}{(c+dx)^4 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx \dots\dots\dots$	2068
3.243	$\int \frac{a+bx}{(c+dx)^3 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx \dots\dots\dots$	2072
3.244	$\int \frac{1}{(c+dx)^2 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx \dots\dots\dots$	2076

3.245	$\int \frac{1}{(a+bx)(c+dx) \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx$	.2080
3.246	$\int \frac{1}{(a+bx)^2 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx$	.2083
3.247	$\int \frac{c+dx}{(a+bx)^3 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx$	.2087
3.248	$\int \frac{(c+dx)^2}{(a+bx)^4 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx$	.2091
3.249	$\int \frac{(A+B \log(e(a+bx)^n(c+dx)^{-n}))^4}{(f+gx)(ah+bhx)} dx$	.2095
3.250	$\int \frac{(A+B \log(e(a+bx)^n(c+dx)^{-n}))^3}{(f+gx)(ah+bhx)} dx$	.2101
3.251	$\int \frac{(A+B \log(e(a+bx)^n(c+dx)^{-n}))^2}{(f+gx)(ah+bhx)} dx$	.2107
3.252	$\int \frac{A+B \log(e(a+bx)^n(c+dx)^{-n})}{(f+gx)(ah+bhx)} dx$	.2113
3.253	$\int \frac{1}{(f+gx)(ah+bhx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))} dx$	.2119
3.254	$\int \frac{1}{(f+gx)(ah+bhx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))^2} dx$	.2122
3.255	$\int \frac{\log\left(\frac{c+dx}{a+bx}\right)}{(a+bx)((-c)h+(b-d)hx)} dx$	.2126
3.256	$\int \frac{\log\left(\frac{a-cg+(b-dg)x}{a+bx}\right)}{(a+bx)(c+dx)} dx$	.2130
3.257	$\int \frac{\log\left(1-\frac{g(c+dx)}{a+bx}\right)}{(a+bx)(c+dx)} dx$	.2134
3.258	$\int \frac{\log\left(\frac{a-cg+bx-dgx}{a+bx}\right)}{(a+bx)(c+dx)} dx$	.2138
3.259	$\int \frac{(A+B \log(e(a+bx)^n(c+dx)^{-n}))^3}{afh+bghx^2+h(bfx+agx)} dx$	.2142
3.260	$\int \frac{(A+B \log(e(a+bx)^n(c+dx)^{-n}))^2}{afh+bghx^2+h(bfx+agx)} dx$	.2148
3.261	$\int \frac{A+B \log(e(a+bx)^n(c+dx)^{-n})}{afh+bghx^2+h(bfx+agx)} dx$	.2154
3.262	$\int \frac{1}{(afh+bghx^2+h(bfx+agx))(A+B \log(e(a+bx)^n(c+dx)^{-n}))} dx$	.2160
3.263	$\int \frac{1}{(afh+bghx^2+h(bfx+agx))(A+B \log(e(a+bx)^n(c+dx)^{-n}))^2} dx$	.2164

#### 4 Listing of Grading functions

2169

# Chapter 1

## Introduction

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

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

### 1.1 Listing of CAS systems tested

The following systems were tested at this time.

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

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

Sympy was called directly using Python.

## 1.2 Results

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

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

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

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

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

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

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

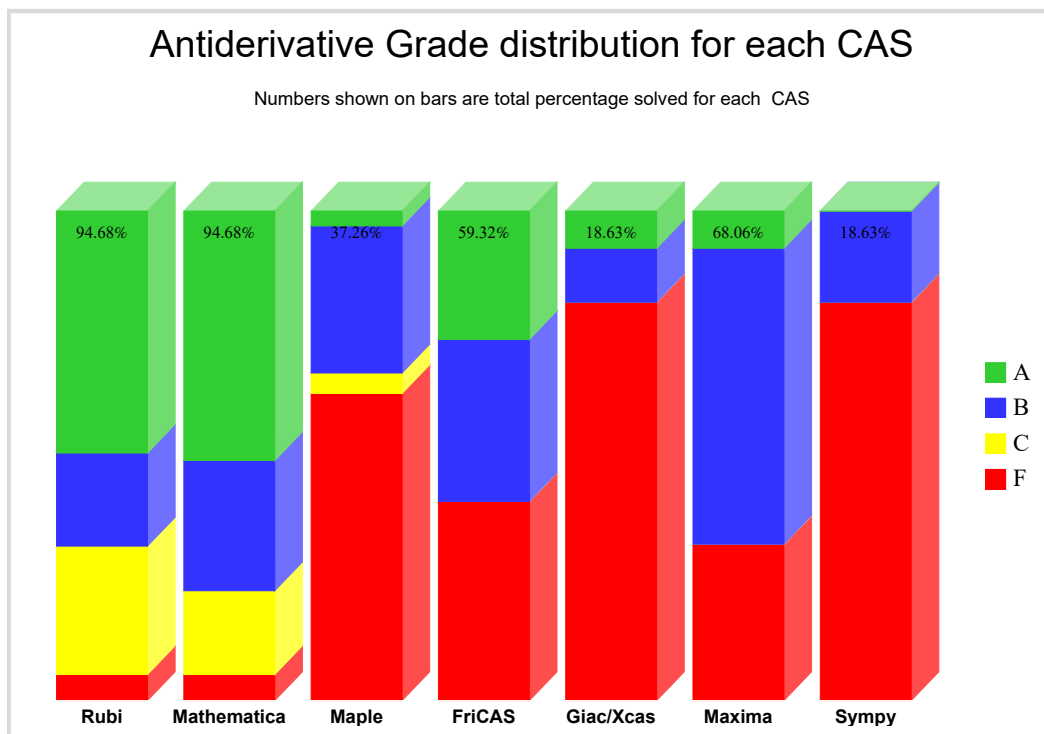


grade	description
A	Integral was solved and antiderivative is optimal in quality and leaf size.
B	Integral was solved and antiderivative is optimal in quality but leaf size is larger than twice the optimal antiderivatives leaf size.
C	Integral was solved and antiderivative is non-optimal in quality. This can be due to one or more of the following reasons <ol style="list-style-type: none"> <li>1. antiderivative contains a hypergeometric function and the optimal antiderivative does not.</li> <li>2. antiderivative contains a special function and the optimal antiderivative does not.</li> <li>3. antiderivative contains the imaginary unit and the optimal antiderivative does not.</li> </ol>
F	Integral was not solved. Either the integral was returned unevaluated within the time limit, or it timed out, or CAS hanged or crashed or an exception was raised.

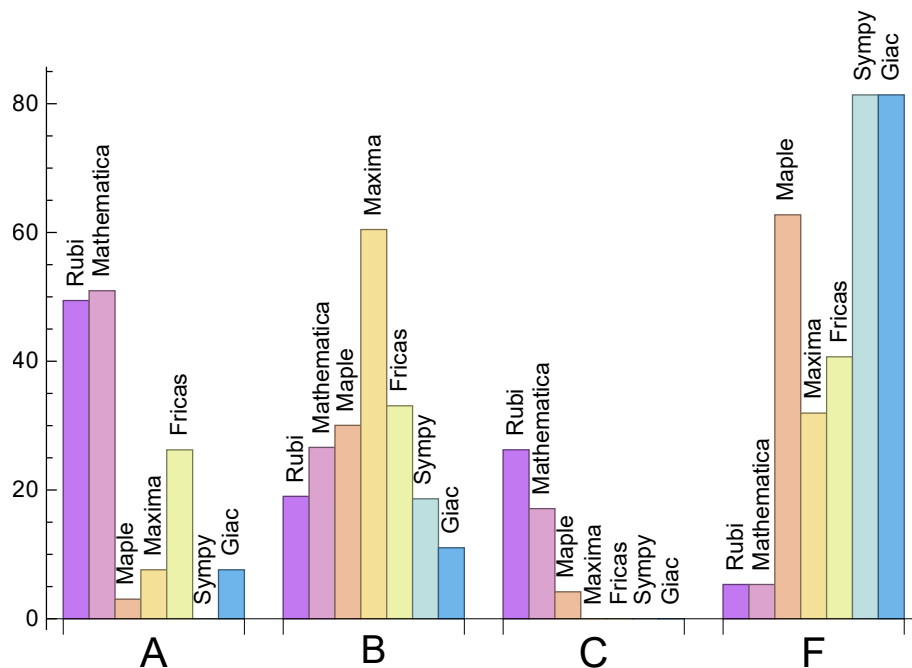
Grading is implemented for all CAS systems. Based on the above, the following table summarizes the grading for this test suite.

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

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



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



### 1.3 Performance

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

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

## 1.4 list of integrals that has no closed form antiderivative

{253, 254, 262, 263}

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

**Rubi** {}

**Mathematica** {}

**Maple** {}

**Maxima** {}

**Fricas** {}

**Sympy** {}

**Giac** {}

## 1.6 list of integrals solved by CAS but failed verification

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

**Rubi** {}

**Mathematica** {}

**Maple** Verification phase not implemented yet.

**Maxima** Verification phase not implemented yet.

**Fricas** Verification phase not implemented yet.

**Sympy** Verification phase not implemented yet.

**Giac** Verification phase not implemented yet.

## 1.7 Timing

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

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

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

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

## 1.8 Verification

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

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

## 1.9 Important notes about some of the results

### 1.9.1 Important note about Maxima results

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

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

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

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

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

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

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

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

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

## 1.9.2 Important note about FriCAS and Giac/X-CAS results

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

These will fail With error `Exception raised: NotImplementedError`

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

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

## 1.9.3 Important note about finding leaf size of antiderivative

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

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

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

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

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

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

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

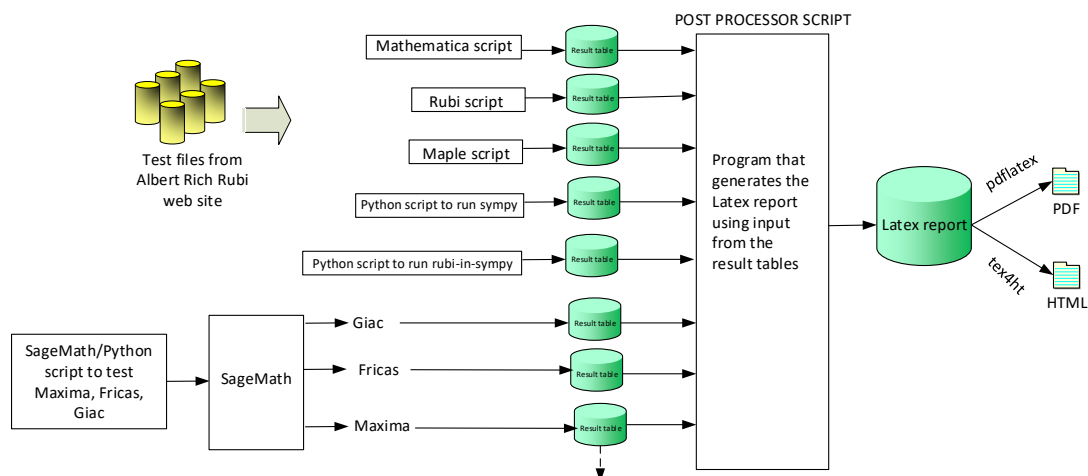
```
try:
    # 1.7 is a fudge factor since it is low side from actual leaf count
    leafCount = round(1.7*count_ops(anti))

except Exception as ee:
    leafCount =1
```

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

## 1.10 Design of the test system

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



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

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

### High level overview of the CAS independent integration test build system



# Chapter 2

## detailed summary tables of results

### 2.1 List of integrals sorted by grade for each CAS

#### 2.1.1 Rubi

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

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

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

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

#### 2.1.2 Mathematica

A grade: { 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 19, 20, 21, 22, 23, 24, 25, 26, 27, 31, 32, 33, 34, 39, 40, 41, 42, 47, 48, 50, 55, 56, 58, 65, 66, 67, 75, 76, 77, 87, 88, 89, 90, 91, 96, 97, 98, 99, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 115, 116, 117, 118, 119, 120, 121, 122, 123, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 143, 144, 145, 146, 151, 152, 154, 159, 160, 162, 169, 170,

171, 179, 180, 181, 190, 212, 213, 214, 218, 219, 220, 224, 225, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 241, 242, 243, 244, 245, 246, 247, 248, 253, 254, 262, 263 }

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

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

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

## 2.1.3 Maple

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

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

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

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

## 2.1.4 Maxima

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

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

C grade: { }

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

## 2.1.5 FriCAS

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

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

C grade: { }

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

## 2.1.6 Sympy

A grade: { }

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

C grade: { }

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

## 2.1.7 Giac

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

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

C grade: { }

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

## 2.2 Detailed conclusion table per each integral for all CAS systems

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



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

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

## 2.3 Detailed conclusion table specific for Rubi results

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

Table 2.1: Rubi specific breakdown of results for each integral

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

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
9	A	10	4	0.96	38	0.105
10	A	14	4	0.78	40	0.1
11	A	14	4	0.88	40	0.1
12	A	10	4	0.84	38	0.105
13	A	4	3	1.	30	0.1
14	A	19	13	1.28	40	0.325
15	A	18	13	1.27	40	0.325
16	A	19	11	1.47	40	0.275
17	B	14	4	3.22	40	0.1
18	A	14	4	1.8	40	0.1
19	A	14	4	1.28	40	0.1
20	A	18	4	0.91	40	0.1
21	A	14	4	0.89	40	0.1
22	A	10	4	0.86	38	0.105
23	A	4	3	1.	30	0.1
24	A	23	13	1.22	40	0.325
25	A	22	14	1.4	40	0.35
26	A	22	13	1.28	40	0.325
27	A	23	11	1.37	40	0.275
28	B	18	4	4.19	40	0.1
29	B	18	4	2.26	40	0.1
30	A	18	4	1.58	40	0.1
31	A	23	13	1.62	40	0.325
32	A	19	13	1.66	40	0.325
33	A	14	11	1.7	38	0.29
34	A	10	8	1.61	30	0.267
35	C	20	9	6.91	40	0.225
36	C	24	11	2.53	40	0.275
37	C	28	11	2.1	40	0.275
38	C	32	11	1.66	40	0.275
39	A	22	14	1.52	40	0.35
40	A	18	13	1.29	40	0.325

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
41	A	15	11	1.39	38	0.29
42	A	4	3	1.03	30	0.1
43	C	24	11	2.77	40	0.275
44	C	28	11	1.77	40	0.275
45	C	32	11	1.73	40	0.275
46	C	36	11	1.54	40	0.275
47	A	22	13	1.22	40	0.325
48	A	19	11	1.35	40	0.275
49	B	10	4	2.25	38	0.105
50	A	4	3	1.	30	0.1
51	C	28	11	2.2	40	0.275
52	C	32	11	1.73	40	0.275
53	C	36	11	1.45	40	0.275
54	C	40	11	1.47	40	0.275
55	A	54	13	1.15	40	0.325
56	A	46	13	1.19	40	0.325
57	B	78	14	3.54	38	0.368
58	A	16	12	1.39	30	0.4
59	B	39	19	2.25	40	0.475
60	B	43	20	2.93	40	0.5
61	C	58	11	4.53	40	0.275
62	C	66	11	2.58	40	0.275
63	C	74	11	1.86	40	0.275
64	A	86	13	1.11	42	0.31
65	A	74	13	0.88	42	0.31
66	A	46	13	0.97	40	0.325
67	A	20	13	1.26	32	0.406
68	B	86	27	3.13	42	0.643
69	B	65	21	2.76	42	0.5
70	B	73	20	2.41	42	0.476
71	C	92	11	5.63	42	0.262
72	C	104	11	3.08	42	0.262

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
73	C	116	11	2.18	42	0.262
74	A	122	13	0.82	42	0.31
75	A	86	13	0.91	42	0.31
76	A	54	13	0.9	40	0.325
77	A	24	13	1.2	32	0.406
78	B	106	28	2.62	42	0.667
79	B	90	23	2.53	42	0.548
80	B	95	21	2.34	42	0.5
81	C	130	11	6.6	42	0.262
82	C	146	11	3.55	42	0.262
83	C	162	11	2.49	42	0.262
84	B	106	28	2.55	42	0.667
85	B	86	27	3.11	42	0.643
86	B	68	24	3.79	40	0.6
87	B	46	23	5.68	32	0.719
88	C	61	29	26.43	42	0.69
89	C	87	31	9.2	42	0.738
90	C	117	31	5.54	42	0.738
91	C	151	31	4.03	42	0.738
92	B	119	28	3.08	42	0.667
93	B	94	26	3.58	42	0.619
94	B	72	25	4.06	40	0.625
95	C	26	11	3.11	32	0.344
96	C	87	31	7.88	42	0.738
97	C	113	31	4.17	42	0.738
98	C	143	31	3.96	42	0.738
99	C	177	31	3.26	42	0.738
100	B	124	26	2.98	42	0.619
101	B	102	25	3.24	42	0.595
102	C	58	11	4.5	40	0.275
103	C	30	11	1.95	32	0.344
104	C	117	31	5.06	42	0.738

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
105	C	143	31	3.94	42	0.738
106	C	173	31	2.8	42	0.738
107	C	207	31	2.88	42	0.738
108	A	10	4	1.09	41	0.098
109	A	10	4	1.11	41	0.098
110	B	13	6	2.09	39	0.154
111	A	4	3	1.	31	0.097
112	A	13	10	1.58	41	0.244
113	A	14	11	1.55	41	0.268
114	B	10	4	2.26	41	0.098
115	A	10	4	1.3	41	0.098
116	A	10	4	0.96	41	0.098
117	A	14	4	0.78	43	0.093
118	A	14	4	0.88	43	0.093
119	A	10	4	0.84	41	0.098
120	A	4	3	1.	33	0.091
121	A	18	13	1.28	43	0.302
122	A	17	13	1.26	43	0.302
123	A	18	11	1.46	43	0.256
124	B	14	4	3.24	43	0.093
125	A	14	4	1.8	43	0.093
126	A	14	4	1.28	43	0.093
127	A	18	4	0.91	43	0.093
128	A	14	4	0.89	43	0.093
129	A	10	4	0.86	41	0.098
130	A	4	3	1.	33	0.091
131	A	22	13	1.22	43	0.302
132	A	21	14	1.39	43	0.326
133	A	21	13	1.28	43	0.302
134	A	22	11	1.36	43	0.256
135	A	22	13	1.58	43	0.302
136	A	18	13	1.63	43	0.302

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
137	A	13	10	1.66	41	0.244
138	A	9	8	1.6	33	0.242
139	C	18	8	6.32	43	0.186
140	C	22	11	2.51	43	0.256
141	C	26	11	2.09	43	0.256
142	C	30	11	1.66	43	0.256
143	A	21	14	1.51	43	0.326
144	A	17	13	1.28	43	0.302
145	A	14	11	1.39	41	0.268
146	A	4	3	1.05	33	0.091
147	C	22	11	2.71	43	0.256
148	C	26	11	1.77	43	0.256
149	C	30	11	1.73	43	0.256
150	C	34	11	1.54	43	0.256
151	A	21	13	1.21	43	0.302
152	A	18	11	1.35	43	0.256
153	B	10	4	2.26	41	0.098
154	A	4	3	1.	33	0.091
155	C	26	11	2.19	43	0.256
156	C	30	11	1.72	43	0.256
157	C	34	11	1.45	43	0.256
158	C	38	11	1.46	43	0.256
159	A	52	13	1.15	43	0.302
160	A	44	13	1.19	43	0.302
161	B	72	14	3.56	41	0.342
162	A	15	12	1.4	33	0.364
163	B	36	19	2.26	43	0.442
164	B	40	20	2.93	43	0.465
165	C	54	11	4.58	43	0.256
166	C	62	11	2.61	43	0.256
167	C	70	11	1.88	43	0.256
168	A	83	13	1.11	45	0.289

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
169	A	71	13	0.87	45	0.289
170	A	44	13	0.97	43	0.302
171	A	19	13	1.26	35	0.371
172	B	82	27	3.13	45	0.6
173	B	60	21	2.77	45	0.467
174	B	68	20	2.41	45	0.444
175	C	86	11	5.66	45	0.244
176	C	98	11	3.1	45	0.244
177	C	110	11	2.2	45	0.244
178	A	118	13	0.82	45	0.289
179	A	83	13	0.91	45	0.289
180	A	52	13	0.9	43	0.302
181	A	23	13	1.2	35	0.371
182	B	101	28	2.62	45	0.622
183	B	83	23	2.54	45	0.511
184	B	88	21	2.35	45	0.467
185	B	100	20	2.09	45	0.444
186	B	101	28	2.54	45	0.622
187	B	82	27	3.11	45	0.6
188	B	65	24	3.82	43	0.558
189	B	45	23	5.71	35	0.657
190	C	59	29	24.74	45	0.644
191	C	83	31	9.05	45	0.689
192	C	111	31	5.49	45	0.689
193	C	143	31	4.01	45	0.689
194	B	112	28	3.1	45	0.622
195	B	89	26	3.61	45	0.578
196	B	69	25	4.1	43	0.581
197	C	24	11	3.15	35	0.314
198	C	83	31	7.81	45	0.689
199	C	107	31	4.14	45	0.689
200	C	135	31	3.94	45	0.689

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
201	C	167	31	3.25	45	0.689
202	B	117	26	3.	45	0.578
203	B	97	25	3.25	45	0.556
204	C	54	11	4.54	43	0.256
205	C	28	11	1.97	35	0.314
206	C	111	31	5.04	45	0.689
207	C	135	31	3.93	45	0.689
208	C	163	31	2.79	45	0.689
209	C	195	31	2.87	45	0.689
210	F	0	0	N/A	0	N/A
211	F	0	0	N/A	0	N/A
212	F	0	0	N/A	0	N/A
213	F	0	0	N/A	0	N/A
214	A	6	4	1.31	47	0.085
215	F	0	0	N/A	0	N/A
216	F	0	0	N/A	0	N/A
217	F	0	0	N/A	0	N/A
218	F	0	0	N/A	0	N/A
219	F	0	0	N/A	0	N/A
220	A	6	4	1.24	47	0.085
221	F	0	0	N/A	0	N/A
222	F	0	0	N/A	0	N/A
223	F	0	0	N/A	0	N/A
224	A	1	1	1.	35	0.029
225	A	1	1	1.	42	0.024
226	F	0	0	N/A	0	N/A
227	F	0	0	N/A	0	N/A
228	A	1	1	1.	40	0.025
229	A	1	1	1.	40	0.025
230	A	1	1	1.	38	0.026
231	A	1	1	1.	40	0.025
232	A	1	1	1.	40	0.025

Continued on next page



Table 2.1 – continued from previous page

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



# Chapter 3

## Listing of integrals

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

**Optimal.** Leaf size=212

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

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

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

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

Antiderivative was successfully verified.

[In]  $\text{Int}[(a*g + b*g*x)^3*(c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x]]),x]$

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

$$a*d)*g^{3*i*(a + b*x)^4}/(20*b^2) + ((b*c - a*d)*g^{3*i*(a + b*x)^4*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x])])/(4*b^2) + (d*g^{3*i*(a + b*x)^5*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x])])/(5*b^2) + (B*(b*c - a*d)^5*g^{3*i*\text{Log}[c + d*x]})/(20*b^2*d^4)$$

### Rule 2528

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

### Rule 2525

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

### Rule 12

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

### Rule 43

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

### Rubi steps

$$\begin{aligned}
\int (c + dx)(ag + bgx)^3 \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right) dx &= \int \left( \frac{(bc - ad)(ag + bgx)^3 \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right)}{b} + \frac{d(ag + bgx)^4 \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right)}{b} \right) dx \\
&= \frac{(bc - ad) \int (ag + bgx)^3 \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right) dx}{b} + \frac{d \int (ag + bgx)^4 \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right) dx}{b} \\
&= \frac{(bc - ad)g^3(a + bx)^4 \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right)}{4b^2} + \frac{dg^3(a + bx)^5 \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right)}{5b^2} \\
&= \frac{(bc - ad)g^3(a + bx)^4 \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right)}{4b^2} + \frac{dg^3(a + bx)^5 \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right)}{5b^2} \\
&= \frac{(bc - ad)g^3(a + bx)^4 \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right)}{4b^2} + \frac{dg^3(a + bx)^5 \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right)}{5b^2} \\
&= -\frac{B(bc - ad)^4 g^3 x}{20bd^3} + \frac{B(bc - ad)^3 g^3 (a + bx)^2}{40b^2 d^2} - \frac{B(bc - ad)^2 g^3 (a + bx)}{60b^2 d}
\end{aligned}$$

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

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

Antiderivative was successfully verified.

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

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

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

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

$$\frac{(2c^2d - b^3c^3)/d}{(B^5d^5g^3i - 5B^4bcd^4g^3i - 10B^3b^2c^2d^3g^3i + 10B^2b^3c^3d^2g^3i - 5B^4c^4d^2g^3i + B^5c^5g^3i)} + x^4 \left( \frac{3A^2d^2g^3i}{4} + \frac{A^3c^3g^3i}{4} + \frac{B^2d^2g^3i}{20} - \frac{B^3c^3g^3i}{20} \right) + (B^3c^3g^3ix + B^3d^3g^3ix^2/2 + 3B^2bc^3g^3ix^2/2 + B^2b^2d^3g^3ix^3 + B^2b^2c^3g^3ix^3 + 3B^2b^2d^3g^3ix^4/4 + B^3c^3g^3ix^4/4 + B^3d^3g^3ix^5/5) \log\left(\frac{e(a+bx)}{c+dx}\right) + x^3 \left( \frac{60A^2bd^2g^3i + 60A^2bcd^2g^3i + 11B^2bd^2g^3i - 10B^2bcd^2g^3i - B^3c^2g^3i}{60d} \right) + x^2 \left( \frac{20A^3d^3g^3i + 60A^2bd^2g^3i + 9B^3d^3g^3i - 5B^2bd^2g^3i - 5B^2bcd^2g^3i + B^3c^3g^3i}{40d^2} \right) + x \left( \frac{20A^3bcd^3g^3i + B^4d^4g^3i + 5B^3bcd^3g^3i - 10B^2bd^2c^2d^2g^3i + 5B^2bcd^3g^3i - B^4c^4g^3i}{20bd^3} \right)$$

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```



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

**Optimal.** Leaf size=180

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

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

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

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

Antiderivative was successfully verified.

[In]  $\text{Int}[(a*g + b*g*x)^2*(c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]$

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

### Rule 2528

$\text{Int}[(a + b \log(c + R F x)) (b + R G x)^n, x\_Symbol] \rightarrow \text{With}[\{u = \text{ExpandIntegrand}[(a + b \log(c + R F x))^n, R G x, x]\}, \text{Int}[u, x] /; \text{SumQ}[u] /; \text{FreeQ}[\{a, b, c, p\}, x] \&\& \text{RationalFunctionQ}[R F x, x] \&\& \text{RationalFunctionQ}[R G x, x] \&\& \text{IGtQ}[n, 0]$

### Rule 2525

$\text{Int}[(a + b \log(c + R F x)) (b + R G x)^n ((d + e x)^m + (e x)^m), x\_Symbol] \rightarrow \text{Simp}[(d + e x)^{m+1} (a + b \log(c + R F x))^n / (e^{m+1})]$

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

### Rule 12

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

### Rule 43

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

### Rubi steps

$$\begin{aligned}
\int (2c + 2dx)(ag + bgx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) dx &= \int \left( \frac{2(bc - ad)(ag + bgx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b} + \frac{2d(ag + bgx)^3}{b} \right) dx \\
&= \frac{(2(bc - ad)) \int (ag + bgx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) dx}{b} + \frac{(2d) \int (ag + bgx)^3 dx}{b} \\
&= \frac{2(bc - ad)g^2(a + bx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{3b^2} + \frac{dg^2(a + bx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{2b^2} \\
&= \frac{2(bc - ad)g^2(a + bx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{3b^2} + \frac{dg^2(a + bx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{2b^2} \\
&= \frac{2(bc - ad)g^2(a + bx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{3b^2} + \frac{dg^2(a + bx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{2b^2} \\
&= \frac{B(bc - ad)^3 g^2 x}{6bd^2} - \frac{B(bc - ad)^2 g^2 (a + bx)^2}{12b^2 d} - \frac{B(bc - ad) g^2 (a + bx)^3}{6b^2}
\end{aligned}$$

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

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

Antiderivative was successfully verified.

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

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

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

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

$$\begin{aligned}
&)) * b^4 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^2 * c^6 / (d * x + c)^2 - 7 * e^4 * d^3 * B * g^2 * i * \ln(b \\
&* e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^4 * a^6 / (d * x + c)^4 * c \\
&^2 + 14 * e^3 * d^2 * B * g^2 * i * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x \\
&+ c) * b * c)^3 * a^5 / (d * x + c)^3 * c^2 - 8 / 3 * e^3 / d^2 * B * g^2 * i * b^4 * \ln(b * e / d + (a * d - b * c) * e / d \\
&/ (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^3 * c^3 * a + 10 * e^2 * B * g^2 * i * \ln(b * e / d + (a * \\
&d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^2 * a^3 / (d * x + c)^2 * c^3 * b + 14 * \\
&e^4 * B * g^2 * i * b^3 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * \\
&c)^4 * a^3 / (d * x + c)^4 * c^5 - e^4 / d^2 * A * g^2 * i * b^5 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^4 * \\
&c^3 * a - 8 / 3 * e^3 / d^2 * A * g^2 * i * b^4 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^3 * c^3 * a + 5 / 24 * e^ \\
&2 / d^3 * B * g^2 * i / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^2 * b^4 * c^4 + 1 / 4 * e^4 / d^3 * A * g^2 * i * b \\
&^6 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^4 * c^4 + 1 / 4 * e^4 * d * A * g^2 * i * b^2 / (d * e / (d * x + c) * a \\
&- e / (d * x + c) * b * c)^4 * a^4 + 1 / 12 * e^3 / d^3 * B * g^2 * i * b^5 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c \\
&)^3 * c^4 - 1 / 3 * e^3 * B * g^2 * i * b^2 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^3 * a^3 * c - 5 / 6 * e^2 * B \\
&* g^2 * i / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^2 * a^3 * b * c - 1 / 3 / d^2 * B * g^2 * i * b * \ln(d * (b * e / \\
&d + (a * d - b * c) * e / d / (d * x + c)) - b * e) * c^3 * a + 1 / 2 * e^2 * d * B * g^2 * i * \ln(b * e / d + (a * d - b * c) * e / \\
&d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^2 * a^4 + 1 / 12 * e / d^3 * B * g^2 * i * b^3 / (d * e / \\
&(d * x + c) * a - e / (d * x + c) * b * c) * c^4 + 1 / 12 * e * d * B * g^2 * i / b / (d * e / (d * x + c) * a - e / (d * x + c) * b * \\
&c) * a^4 + 1 / 12 * e^3 * d * B * g^2 * i * b / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^3 * a^4 + 1 / 2 * e^2 / d^3 \\
&* A * g^2 * i / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^2 * b^4 * c^4 - 8 / 3 * e^3 * A * g^2 * i * b^2 / (d * e / ( \\
&d * x + c) * a - e / (d * x + c) * b * c)^3 * a^3 * c - e^4 * A * g^2 * i * b^3 / (d * e / (d * x + c) * a - e / (d * x + c) * b * \\
&c)^4 * a^3 * c - 2 * e^2 * A * g^2 * i / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^2 * a^3 * b * c + 2 / 3 * e^3 * d * \\
&A * g^2 * i * b / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^3 * a^4 + 2 / 3 * e^3 / d^3 * A * g^2 * i * b^5 / (d * e / \\
&(d * x + c) * a - e / (d * x + c) * b * c)^3 * c^4 + 3 * e^2 / d * A * g^2 * i / (d * e / (d * x + c) * a - e / (d * x + c) * b * c \\
&)^2 * a^2 * b^2 * c^2 - 2 * e^2 / d^2 * A * g^2 * i / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^2 * b^3 * c^3 * a \\
&+ 1 / 2 * e / d * B * g^2 * i / (d * e / (d * x + c) * a - e / (d * x + c) * b * c) * a^2 * c^2 * b + 1 / 2 * e^2 / d^3 * B * g^2 * \\
&i * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) * b^4 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^2 * c^4 + 2 \\
&/ 3 * e^3 / d^3 * B * g^2 * i * b^5 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * \\
&x + c) * b * c)^3 * c^4 + 14 / 3 * e^3 / d^2 * B * g^2 * i * b^4 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d \\
&* e / (d * x + c) * a - e / (d * x + c) * b * c)^3 * c^6 / (d * x + c)^3 * a + 2 * e^4 * d^4 * B * g^2 * i / b * \ln(b * e / d + \\
&(a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^4 * a^7 / (d * x + c)^4 * c - 14 / 3 \\
&* e^3 * d^3 * B * g^2 * i / b * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) \\
&* b * c)^3 * a^6 / (d * x + c)^3 * c - 35 / 2 * e^4 * d * B * g^2 * i * b^2 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + \\
&c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^4 * a^4 / (d * x + c)^4 * c^4 + 3 * e^2 * d^2 * B * g^2 * i * \ln( \\
&b * e / d + (a * d - b * c) * e / d / (d * x + c)) / b / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^2 * a^5 / (d * x + c)^ \\
&2 * c - 14 * e^3 / d * B * g^2 * i * b^3 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / ( \\
&d * x + c) * b * c)^3 * c^5 / (d * x + c)^3 * a^2 - 15 / 2 * e^2 / d * B * g^2 * i * \ln(b * e / d + (a * d - b * c) * e / d / ( \\
&d * x + c)) * b^2 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^2 * c^4 / (d * x + c)^2 * a^2 + 2 * e^4 / d^2 * B * g \\
&^2 * i * b^5 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^4 * c^ \\
&7 / (d * x + c)^4 * a + 3 * e^2 / d^2 * B * g^2 * i * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) * b^3 / (d * e / (d \\
&* x + c) * a - e / (d * x + c) * b * c)^2 * c^5 / (d * x + c)^2 * a - 70 / 3 * e^3 * d * B * g^2 * i * \ln(b * e / d + (a * d - b \\
&* c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^3 * a^4 / (d * x + c)^3 * c^3 * b + 14 * e^4 \\
&* d^2 * B * g^2 * i * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^ \\
&4 * a^5 / (d * x + c)^4 * c^3 * b - 7 * e^4 / d * B * g^2 * i * b^4 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / ( \\
&d * e / (d * x + c) * a - e / (d * x + c) * b * c)^4 * c^6 / (d * x + c)^4 * a^2 - 15 / 2 * e^2 * d * B * g^2 * i * \ln(b * e / \\
&d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^2 * a^4 / (d * x + c)^2 * c^2 -
\end{aligned}$$

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

[Out]  $\frac{1}{4} A b^2 d g^2 i x^4 + \frac{1}{3} A b^2 c g^2 i x^3 + \frac{2}{3} A a b d g^2 i x^3 + A a b^2 c g^2 i x^2 + \frac{1}{2} A a^2 d g^2 i x^2 + (x \log(b e x / (d x + c) + a e / (d x + c)) + a \log(b x + a) / b - c \log(d x + c) / d) B a^2 c g^2 i + (x^2 \log(b e x / (d x + c) + a e / (d x + c)) - a^2 \log(b x + a) / b^2 + c^2 \log(d x + c) / d^2 - (b c - a d) x / (b d)) B a b c g^2 i + \frac{1}{6} (2 x^3 \log(b e x / (d x + c) + a e / (d x + c)) + 2 a^3 \log(b x + a) / b^3 - 2 c^3 \log(d x + c) / d^3 - ((b^2 c d - a b d^2) x^2 - 2 (b^2 c^2 - a^2 d^2) x) / (b^2 d^2)) B b^2 c g^2 i + \frac{1}{2} (x^2 \log(b e x / (d x + c) + a e / (d x + c)) - a^2 \log(b x + a) / b^2 + c^2 \log(d x + c) / d^2 - (b c - a d) x / (b d)) B a^2 d g^2 i + \frac{1}{3} (2 x^3 \log(b e x / (d x + c) + a e / (d x + c)) + 2 a^3 \log(b x + a) / b^3 - 2 c^3 \log(d x + c) / d^3 - ((b^2 c d - a b d^2) x^2 - 2 (b^2 c^2 - a^2 d^2) x) / (b^2 d^2)) B a b d g^2 i + \frac{1}{24} (6 x^4 \log(b e x / (d x + c) + a e / (d x + c)) - 6 a^4 \log(b x + a) / b^4 + 6 c^4 \log(d x + c) / d^4 - (2 (b^3 c d^2 - a b^2 d^3) x^3 - 3 (b^3 c^2 d - a^2 b d^3) x^2 + 6 (b^3 c^3 - a^3 d^3) x) / (b^3 d^3)) B b^2 d g^2 i + A a^2 c g^2 i x$

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

$$6Ab^4d^4g^2ix^4 + 2((4A - B)b^4cd^3 + (8A + B)ab^3d^4)g^2ix^3 - (Bb^4c^2d^2 - 4(6A - B)ab^3cd^3 - (12A + 5B)a^2b^2d^4)g^2ix^2 + 2$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

$$\begin{aligned}
& *d*g^{2i}/3 + A*b^{2i}*c*g^{2i}/3 + B*a*b*d*g^{2i}/12 - B*b^{2i}*c*g^{2i}/12) + \\
& (B*a^{2i}*c*g^{2i}*x + B*a^{2i}*d*g^{2i}*x^{2/2} + B*a*b*c*g^{2i}*x^{2} + 2*B*a* \\
& b*d*g^{2i}*x^{3/3} + B*b^{2i}*c*g^{2i}*x^{3/3} + B*b^{2i}*d*g^{2i}*x^{4/4})*\log(e* \\
& (a + b*x)/(c + d*x)) + x^{2i}*(12*A*a^{2i}*d^{2i}*g^{2i} + 24*A*a*b*c*d*g^{2i} + \\
& 5*B*a^{2i}*d^{2i}*g^{2i} - 4*B*a*b*c*d*g^{2i} - B*b^{2i}*c^{2i}*g^{2i})/(24*d) + x* \\
& (12*A*a^{2i}*b*c*d^{2i}*g^{2i} + B*a^{3i}*d^{3i}*g^{2i} + 2*B*a^{2i}*b*c*d^{2i}*g^{2i} \\
& - 4*B*a*b^{2i}*c^{2i}*d*g^{2i} + B*b^{3i}*c^{3i}*g^{2i})/(12*b*d^{2i})
\end{aligned}$$

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

**Optimal.** Leaf size=140

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

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

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

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

Antiderivative was successfully verified.

[In]  $\text{Int}[(a*g + b*g*x)*(c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]$

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

#### Rule 2528

$\text{Int}[(a_.) + \text{Log}[(c_.)*(Rfx_)^(p_.)]*(b_.)]^(n_.)*(RGx_), x\_Symbol] \rightarrow \text{With}[\{u = \text{ExpandIntegrand}[(a + b*\text{Log}[c*Rfx^p])^n, RGx, x]\}, \text{Int}[u, x] /; \text{SumQ}[u]] /; \text{FreeQ}\{a, b, c, p\}, x] \&\& \text{RationalFunctionQ}[Rfx, x] \&\& \text{RationalFunctionQ}[RGx, x] \&\& \text{IGtQ}[n, 0]$

#### Rule 2486



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

### Rule 31

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

### Rule 2525

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

### Rule 12

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

### Rule 72

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

### Rubi steps

$$\begin{aligned}
\int (3c + 3dx)(ag + bgx) \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right) dx &= \int \left( 3acg \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right) + 3(bc + ad)gx \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right) \right) dx \\
&= (3acg) \int \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right) dx + (3bdg) \int x^2 \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right) dx \\
&= 3aAcgx + \frac{3}{2}(bc + ad)gx^2 \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right) + bdgx^3 \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right) \\
&= 3aAcgx + \frac{3aBcg(a + bx) \log \left( \frac{e(a + bx)}{c + dx} \right)}{b} + \frac{3}{2}(bc + ad)gx^2 \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right) \\
&= 3aAcgx + \frac{3aBcg(a + bx) \log \left( \frac{e(a + bx)}{c + dx} \right)}{b} + \frac{3}{2}(bc + ad)gx^2 \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right) \\
&= 3aAcgx - \frac{B(bc - ad)(bc + ad)gx}{2bd} - \frac{1}{2}B(bc - ad)gx^2 + \frac{a^3Bdg \log(a + bx)}{b^2}
\end{aligned}$$

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

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

Antiderivative was successfully verified.

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

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

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.



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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

---

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

---

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

**Optimal.** Leaf size=81

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

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

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

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

Antiderivative was successfully verified.

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

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

#### Rule 2525

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

#### Rule 12

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

#### Rule 43

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

### Rubi steps

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

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

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

Antiderivative was successfully verified.

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

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

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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



[Out]  $\frac{1}{2}(A*b^2*d^2*i*x^2 - B*b^2*c^2*i*\log(d*x + c) + ((2*A - B)*b^2*c*d + B*a*b*d^2)*i*x + (2*B*a*b*c*d - B*a^2*d^2)*i*\log(b*x + a) + (B*b^2*d^2*i*x^2 + 2*B*b^2*c*d*i*x)*\log((b*e*x + a*e)/(d*x + c)))/(b^2*d)$

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

$$\frac{A d i x^2}{2} - \frac{B a i (a d - 2 b c) \log\left(x + \frac{B a^2 c d i + \frac{B a^2 d i (a d - 2 b c)}{b} - 3 B a b c^2 i - B a c i (a d - 2 b c)}{B a^2 d^2 i - 2 B a b c d i - B b^2 c^2 i}\right)}{2 b^2} - \frac{B c^2 i \log\left(x + \frac{B a^2 c d i - 2 B a b c^2 i - \frac{B b^2 c^3 i}{d}}{B a^2 d^2 i - 2 B a b c d i - B b^2 c^2 i}\right)}{2 d} + \left(B c i x + \frac{B d i}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\frac{1}{2}(A d i + B d i)x^2 + \frac{1}{2}(B d i x^2 + 2 B c i x) \log\left(\frac{b x + a}{d x + c}\right) + \frac{(2 A b c i + B b c i + B a d i)x}{2 b} - \frac{(B b^2 c^2 i - 2 B a b c d i + B a^2 d^2 i) \log\left(\frac{b d x + a d}{b^2 d}\right)}{4 b^2 d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out]  $\frac{1}{2}(A*d*i + B*d*i)*x^2 + \frac{1}{2}(B*d*i*x^2 + 2*B*c*i*x)*\log((b*x + a)/(d*x + c)) + \frac{1}{2}(2*A*b*c*i + B*b*c*i + B*a*d*i)*x/b - \frac{1}{4}(B*b^2*c^2*i - 2*B*a*b*c*d*i + B*a^2*d^2*i)*\log(\text{abs}(b*d*x^2 + b*c*x + a*d*x + a*c))/(b^2*d) + \frac{1}{4}(B*b^3*c^3*i + B*a*b^2*c^2*d*i - 3*B*a^2*b*c*d^2*i + B*a^3*d^3*i)*\log(\text{abs}((2*b*d*x + b*c + a*d - \text{abs}(-b*c + a*d))/(2*b*d*x + b*c + a*d + \text{abs}(-b*c + a*d))))/(b^2*d*\text{abs}(-b*c + a*d))$

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

**Optimal.** Leaf size=133

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

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

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

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

Antiderivative was successfully verified.

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

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

### Rule 2528

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*(RGx\_), x\_Symbol] :> With[{u = ExpandIntegrand[(a + b\*Log[c\*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

### Rule 2486

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.)]^(r\_.)]^(s\_.), x\_Symbol] :> Simp[((a + b\*x)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q])^r)^s, x]

$q)^r]^s/b, x] + \text{Dist}[(q*r*s*(b*c - a*d))/b, \text{Int}[\text{Log}[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s - 1)/(c + d*x), x], x] /; \text{FreeQ}\{a, b, c, d, e, f, p, q, r, s\}, x] \&\& \text{NeQ}[b*c - a*d, 0] \&\& \text{EqQ}[p + q, 0] \&\& \text{IGtQ}[s, 0]$

### Rule 31

$\text{Int}[(a + b*x)^{-1}, x\_Symbol] \rightarrow \text{Simp}[\text{Log}[\text{RemoveContent}[a + b*x, x]]/b, x] /; \text{FreeQ}\{a, b\}, x]$

### Rule 2524

$\text{Int}[(a + \text{Log}[c*(RFX)^p]*(b))^n/((d + e*x)), x\_Symbol] \rightarrow \text{Simp}[(\text{Log}[d + e*x]*(a + b*\text{Log}[c*RFX^p])^n)/e, x] - \text{Dist}[(b*n*p)/e, \text{Int}[(\text{Log}[d + e*x]*(a + b*\text{Log}[c*RFX^p])^{n-1}*D[RFX, x])/RFX, x], x] /; \text{FreeQ}\{a, b, c, d, e, p\}, x] \&\& \text{RationalFunctionQ}[RFX, x] \&\& \text{IGtQ}[n, 0]$

### Rule 12

$\text{Int}[a*(u), x\_Symbol] \rightarrow \text{Dist}[a, \text{Int}[u, x], x] /; \text{FreeQ}[a, x] \&\& \text{!MatchQ}[u, (b)*(v)] /; \text{FreeQ}[b, x]$

### Rule 2418

$\text{Int}[(a + \text{Log}[c*((d + e*x)^n)]*(b))^p*(RFX), x\_Symbol] \rightarrow \text{With}\{u = \text{ExpandIntegrand}[(a + b*\text{Log}[c*(d + e*x)^n])^p, RFX, x]\}, \text{Int}[u, x] /; \text{SumQ}[u] /; \text{FreeQ}\{a, b, c, d, e, n\}, x] \&\& \text{RationalFunctionQ}[RFX, x] \&\& \text{IntegerQ}[p]$

### Rule 2390

$\text{Int}[(a + \text{Log}[c*((d + e*x)^n)]*(b))^p*((f + g*x)^q), x\_Symbol] \rightarrow \text{Dist}[1/e, \text{Subst}[\text{Int}[(f*x)/d]^q*(a + b*\text{Log}[c*x^n])^p, x], x, d + e*x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, n, p, q\}, x] \&\& \text{EqQ}[e*f - d*g, 0]$

### Rule 2301

$\text{Int}[(a + \text{Log}[c*(x)^n]*(b))/x, x\_Symbol] \rightarrow \text{Simp}[(a + b*\text{Log}[c*x^n])^2/(2*b*n), x] /; \text{FreeQ}\{a, b, c, n\}, x]$

### Rule 2394

$\text{Int}[(a + \text{Log}[c*((d + e*x)^n)]*(b))/((f + g*x)), x\_Symbol] \rightarrow \text{Simp}[(\text{Log}[(e*(f + g*x))/(e*f - d*g)]*(a + b*\text{Log}[c*(d + e*x)^n]))/g, x] - \text{Dist}[(b*e*n)/g, \text{Int}[\text{Log}[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)]$

, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))])\* (b\_.)]/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :> Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] :> -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rubi steps

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

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

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

Antiderivative was successfully verified.

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

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

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$A di \left( \frac{x}{bg} - \frac{a \log(bx + a)}{b^2 g} \right) + \frac{A ci \log(bgx + ag)}{bg} - \frac{B ci \log(dx + c)}{bg} + \frac{(bci - adi) \left( \log(bx + a) \log\left(\frac{bdx + ad}{bc - ad} + 1\right) \right) + Li_2\left(-\frac{bdx}{bc - ad}\right)}{b^2 g}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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



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

**Optimal.** Leaf size=142

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

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

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

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

Antiderivative was successfully verified.

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

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

### Rule 2528

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

### Rule 2525

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

### Rule 12

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

### Rule 44

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

### Rule 2524

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

### Rule 2418

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

### Rule 2390

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

### Rule 2301

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

Rule 2394

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

Rule 2393

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

Rule 2391

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

Rubi steps

$$\begin{aligned}
\int \frac{(6c + 6dx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{(ag + bgx)^2} dx &= \int \left( \frac{6(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{bg^2(a + bx)^2} + \frac{6d \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{bg^2(a + bx)} \right) dx \\
&= \frac{(6d) \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{a+bx} dx}{bg^2} + \frac{(6(bc - ad)) \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{(a+bx)^2} dx}{bg^2} \\
&= -\frac{6(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2g^2(a + bx)} + \frac{6d \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2g^2} - \frac{(6B)}{b^2g^2} \\
&= -\frac{6(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2g^2(a + bx)} + \frac{6d \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2g^2} + \frac{(6B)}{b^2g^2} \\
&= -\frac{6(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2g^2(a + bx)} + \frac{6d \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2g^2} + \frac{(6B)}{b^2g^2} \\
&= -\frac{6B(bc - ad)}{b^2g^2(a + bx)} - \frac{6Bd \log(a + bx)}{b^2g^2} - \frac{6(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2g^2(a + bx)} + \frac{6d \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2g^2} \\
&= -\frac{6B(bc - ad)}{b^2g^2(a + bx)} - \frac{6Bd \log(a + bx)}{b^2g^2} - \frac{6(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2g^2(a + bx)} + \frac{6d \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2g^2} \\
&= -\frac{6B(bc - ad)}{b^2g^2(a + bx)} - \frac{6Bd \log(a + bx)}{b^2g^2} - \frac{3Bd \log^2(a + bx)}{b^2g^2} - \frac{6(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2g^2(a + bx)} \\
&= -\frac{6B(bc - ad)}{b^2g^2(a + bx)} - \frac{6Bd \log(a + bx)}{b^2g^2} - \frac{3Bd \log^2(a + bx)}{b^2g^2} - \frac{6(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2g^2(a + bx)}
\end{aligned}$$

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

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

Antiderivative was successfully verified.

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

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

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

**Optimal.** Leaf size=85

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

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

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

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

Antiderivative was successfully verified.

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

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

### Rule 2528

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

### Rule 2525

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



$a + b \cdot \text{Log}[c \cdot \text{RFx}^p]^{(n-1)} \cdot D[\text{RFx}, x] / \text{RFx}, x], x] /;$  FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

### Rule 12

Int[(a\_)\*(u\_), x\_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b\_)\*(v\_) /; FreeQ[b, x]]

### Rule 44

Int[((a\_) + (b\_.)\*(x\_))^(m\_.)\*((c\_.) + (d\_.)\*(x\_))^(n\_.), x\_Symbol] := Int[ExpandIntegrand[(a + b\*x)^m\*(c + d\*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b\*c - a\*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])

### Rubi steps

$$\begin{aligned}
 \int \frac{(7c + 7dx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{(ag + bgx)^3} dx &= \int \left( \frac{7(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{bg^3(a + bx)^3} + \frac{7d \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{bg^3(a + bx)^2} \right) dx \\
 &= \frac{(7d) \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{(a+bx)^2} dx}{bg^3} + \frac{(7(bc - ad)) \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{(a+bx)^3} dx}{bg^3} \\
 &= -\frac{7(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{2b^2g^3(a + bx)^2} - \frac{7d \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2g^3(a + bx)} + \frac{(7Bd) \int \frac{bc - a}{(a+bx)^2}}{b^2g^3} \\
 &= -\frac{7(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{2b^2g^3(a + bx)^2} - \frac{7d \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2g^3(a + bx)} + \frac{(7Bd(bc - ad))}{b} \\
 &= -\frac{7(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{2b^2g^3(a + bx)^2} - \frac{7d \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2g^3(a + bx)} + \frac{(7Bd(bc - ad))}{b} \\
 &= -\frac{7B(bc - ad)}{4b^2g^3(a + bx)^2} - \frac{7Bd}{2b^2g^3(a + bx)} - \frac{7Bd^2 \log(a + bx)}{2b^2(bc - ad)g^3} - \frac{7(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{2b^2g^3(a + bx)}
 \end{aligned}$$

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

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

Antiderivative was successfully verified.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] 
$$\begin{aligned} & -1/4*B*d*i*(2*(2*b*x + a)*\log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^4*g^3*x^2 \\ & + 2*a*b^3*g^3*x + a^2*b^2*g^3) + (3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*d)*x) \\ & /((b^5*c - a*b^4*d)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - \\ & a^3*b^2*d)*g^3) + 2*(2*b*c*d - a*d^2)*\log(b*x + a)/((b^4*c^2 - 2*a*b^3*c*d \\ & + a^2*b^2*d^2)*g^3) - 2*(2*b*c*d - a*d^2)*\log(d*x + c)/((b^4*c^2 - 2*a*b^3* \\ & c*d + a^2*b^2*d^2)*g^3)) + 1/4*B*c*i*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b \\ & ^3*d)*g^3*x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) \\ & - 2*\log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2 \\ & *b*g^3) + 2*d^2*\log(b*x + a)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2* \\ & d^2*\log(d*x + c)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3)) - 1/2*(2*b*x + \\ & a)*A*d*i/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) - 1/2*A*c*i/(b^3*g^3*x \\ & ^2 + 2*a*b^2*g^3*x + a^2*b*g^3) \end{aligned}$$

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] 
$$\begin{aligned} & -1/4*(2*((2*A + B)*b^2*c*d - (2*A + B)*a*b*d^2)*i*x + ((2*A + B)*b^2*c^2 - \\ & (2*A + B)*a^2*d^2)*i + 2*(B*b^2*d^2*i*x^2 + 2*B*b^2*c*d*i*x + B*b^2*c^2*i)* \\ & \log((b*e*x + a*e)/(d*x + c))/((b^5*c - a*b^4*d)*g^3*x^2 + 2*(a*b^4*c - a^2 \\ & *b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)*g^3) \end{aligned}$$

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

**Optimal.** Leaf size=173

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

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

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

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

Antiderivative was successfully verified.

[In]  $\text{Int}[\frac{(c*i+d*i*x)*(A+B*Log[(e*(a+b*x))/(c+d*x]])}{(a*g+b*g*x)^4}, x]$

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

### Rule 2528

$\text{Int}[\frac{(a_. + \text{Log}[(c_.)*(RfX_)^(p_.)]*(b_.))^(n_.)*(RGx_)}{(a + b*\text{Log}[c*RfX^p])^n}, x\_Symbol] := \text{With}[\{u = \text{ExpandIntegrand}[(a + b*\text{Log}[c*RfX^p])^n, RGx, x]\}, \text{Int}[u, x] /; \text{SumQ}[u]] /; \text{FreeQ}[\{a, b, c, p\}, x] \&\& \text{RationalFunctionQ}[RfX, x] \&\& \text{RationalFunctionQ}[RGx, x] \&\& \text{IGtQ}[n, 0]$

### Rule 2525

$\text{Int}[\frac{(a_. + \text{Log}[(c_.)*(RfX_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.)}{(d + e*x)^(m+1)*(a + b*\text{Log}[c*RfX^p])^n}, x\_Symbol] := \text{Simp}[\frac{(d + e*x)^(m+1)*(a + b*\text{Log}[c*RfX^p])^n}{(e*(m+1))}$

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

### Rule 12

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

### Rule 44

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

### Rubi steps

$$\begin{aligned}
 \int \frac{(8c + 8dx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{(ag + bgx)^4} dx &= \int \left( \frac{8(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{bg^4(a + bx)^4} + \frac{8d \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{bg^4(a + bx)^3} \right) dx \\
 &= \frac{(8d) \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{(a+bx)^3} dx}{bg^4} + \frac{(8(bc - ad)) \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{(a+bx)^4} dx}{bg^4} \\
 &= -\frac{8(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{3b^2g^4(a + bx)^3} - \frac{4d \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2g^4(a + bx)^2} + \frac{(4Bd) \int \frac{bc-ad}{(a+bx)^3(c+dx)} dx}{b^2g^4} \\
 &= -\frac{8(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{3b^2g^4(a + bx)^3} - \frac{4d \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2g^4(a + bx)^2} + \frac{(4Bd(bc - ad)) \int \frac{1}{c+dx} dx}{b^2g^4} \\
 &= -\frac{8(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{3b^2g^4(a + bx)^3} - \frac{4d \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2g^4(a + bx)^2} + \frac{(4Bd(bc - ad)) \log(c+dx)}{b^2g^4} \\
 &= -\frac{8B(bc - ad)}{9b^2g^4(a + bx)^3} - \frac{2Bd}{3b^2g^4(a + bx)^2} + \frac{4Bd^2}{3b^2(bc - ad)g^4(a + bx)} + \frac{4Bd^3 \log(a + bx)}{3b^2(bc - ad)^2g^4}
 \end{aligned}$$

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

$$i \left( \frac{12Abc}{(a+bx)^3} + \frac{18Ad}{(a+bx)^2} - \frac{12aAd}{(a+bx)^3} - \frac{6Bd^2}{(a+bx)(bc-ad)} - \frac{6Bd^3 \log(a+bx)}{(bc-ad)^2} + \frac{6Bd^3 \log(c+dx)}{(bc-ad)^2} + \frac{6B(ad+2bc+3bdx) \log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^3} + \frac{4bBc}{(a+bx)^3} + \frac{3Bd}{(a+bx)^2} \right) \frac{1}{36b^2g^4}$$

Antiderivative was successfully verified.

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

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

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

[Out]  $\frac{1}{2}e^{2d^2i/(ad-bc)^3/g^4A/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c)^{2a-1/2} * e^{2d^2i/(ad-bc)^3/g^4A/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c)^{2b^c-1/3} e^{3d^2i/(ad-bc)^3/g^4A*b/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c)^{3a+1/3} e^{3i/(ad-bc)^3/g^4A*b^2/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c)^{3c+1/2} e^{2d^2i/(ad-bc)^3/g^4B/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c)^{2*ln(b^e/d+(ad-bc)*e/d/(d*x+c))^a-1/2} e^{2d^2i/(ad-bc)^3/g^4B/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c)^{2*ln(b^e/d+(ad-bc)*e/d/(d*x+c))^b^c+1/4} e^{2d^2i/(ad-bc)^3/g^4B/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c)^{2a-1/4} e^{2d^2i/(ad-bc)^3/g^4B/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c)^{2b^c-1/3} e^{3d^2i/(ad-bc)^3/g^4B*b/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c)^{3*ln(b^e/d+(ad-bc)*e/d/(d*x+c))^a+1/3} e^{3i/(ad-bc)^3/g^4B*b^2/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c)^{3*ln(b^e/d+(ad-bc)*e/d/(d*x+c))^c-1/9} e^{3d^2i/(ad-bc)^3/g^4B*b/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c)^{3a+1/9} e^{3i/(ad-bc)^3/g^4B*b^2/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c)^{3c}$

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\frac{6(Bb^3cd^2 - Bab^2d^3)ix^2 - 3((6A + B)b^3c^2d - 6(2A + B)ab^2cd^2 + (6A + 5B)a^2bd^3)ix - (4(3A + B)b^3c^3 - 9(2A + B)ab^2c^2d - 6(3A + B)a^2b^2cd^2 + 6(2A + B)a^3b^2d^3)}{36((b^7c^2 - 2ab^6cd + a^2b^5d^2)g^4x^3 + 3(ab^6c^2 - 2a^2b^5cd + a^3b^4d^2)g^4x^2 + 3(a^2b^5c^2 - 2a^3b^4cd + a^4b^3d^2)g^4x + (a^3b^4c^2 - 2a^4b^3cd + a^5b^2d^2)g^4) + 6d^3 \log(bx + a) / ((b^5c^3 - 3ab^4c^2d + 3a^2b^3cd^2 - a^3b^2d^3)g^4) - 6d^3 \log(dx + c) / ((b^5c^3 - 3ab^4c^2d + 3a^2b^3cd^2 - a^3b^2d^3)g^4) - 1/6(3bx + a)Adi / (b^5g^4x^3 + 3ab^4g^4x^2 + 3a^2b^3g^4x + a^3b^2g^4) - 1/3Ac i / (b^4g^4x^3 + 3ab^3g^4x^2 + 3a^2b^2g^4x + a^3bg^4)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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



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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

**Optimal.** Leaf size=269

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

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

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

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

Antiderivative was successfully verified.

[In]  $\text{Int}[\frac{(c*i + d*i*x)*(A + B*Log[(e*(a + b*x))/(c + d*x]])}{(a*g + b*g*x)^5}, x]$

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

**Rule 2528**

$\text{Int}[(a_.) + \text{Log}[(c_.)*(RFX_)^(p_.)]*(b_.)]^(n_.)*(RGx_), x\_Symbol] \rightarrow \text{With}[\{u = \text{ExpandIntegrand}[(a + b*Log[c*RFX^p])^n, RGx, x]\}, \text{Int}[u, x] /; \text{SumQ}[u]] /; \text{FreeQ}\{a, b, c, p\}, x\} \&\& \text{RationalFunctionQ}[RFX, x] \&\& \text{RationalFunctionQ}[RGx, x]$

onQ[RGx, x] && IGtQ[n, 0]

### Rule 2525

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

### Rule 12

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

### Rule 44

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

### Rubi steps

$$\begin{aligned}
\int \frac{(9c + 9dx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{(ag + bgx)^5} dx &= \int \left( \frac{9(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{bg^5(a + bx)^5} + \frac{9d \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{bg^5(a + bx)^4} \right) dx \\
&= \frac{(9d) \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{(a+bx)^4} dx}{bg^5} + \frac{(9(bc - ad)) \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{(a+bx)^5} dx}{bg^5} \\
&= -\frac{9(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{4b^2g^5(a + bx)^4} - \frac{3d \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2g^5(a + bx)^3} + \frac{(3Bd) \int \frac{bc - a}{(a+bx)^4}}{b^2g^5} \\
&= -\frac{9(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{4b^2g^5(a + bx)^4} - \frac{3d \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2g^5(a + bx)^3} + \frac{(3Bd(bc - ad))}{b} \\
&= -\frac{9(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{4b^2g^5(a + bx)^4} - \frac{3d \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2g^5(a + bx)^3} + \frac{(3Bd(bc - ad))}{b} \\
&= -\frac{9B(bc - ad)}{16b^2g^5(a + bx)^4} - \frac{Bd}{4b^2g^5(a + bx)^3} + \frac{3Bd^2}{8b^2(bc - ad)g^5(a + bx)^2} - \frac{3Bc}{4b^2(bc - ad)}
\end{aligned}$$

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

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

Antiderivative was successfully verified.

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

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

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In]  $\text{int}((d*i*x+c*i)*(A+B*\ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5,x)$

[Out]  $\frac{1}{2}e^{2d^3i}/(a*d-b*c)^4/g^5A/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{2*a-1/2}$   
 $e^{2*d^2*i}/(a*d-b*c)^4/g^5A/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{2*b*c-2/3}$   
 $e^{3*d^2*i}/(a*d-b*c)^4/g^5A*b/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{3*a+2/3}$   
 $e^{3*d*i}/(a*d-b*c)^4/g^5A*b^2/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{3*c+1/4}$   
 $e^{4*d*i}/(a*d-b*c)^4/g^5A*b^2/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{4*a-1/4}$   
 $e^{4*i}/(a*d-b*c)^4/g^5A*b^3/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{4*c+1/2}$   
 $e^{2*d^3*i}/(a*d-b*c)^4/g^5B/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))}$   
 $a-1/2*e^{2*d^2*i}/(a*d-b*c)^4/g^5B/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))}$   
 $b*c+1/4*e^{2*d^3*i}/(a*d-b*c)^4/g^5B/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{2*a-1/4}$   
 $e^{2*d^2*i}/(a*d-b*c)^4/g^5B/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{2*b*c-2/3}$   
 $e^{3*d^2*i}/(a*d-b*c)^4/g^5B*b/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))}$   
 $a+2/3*e^{3*d*i}/(a*d-b*c)^4/g^5B*b^2/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))}$   
 $c-2/9*e^{3*d^2*i}/(a*d-b*c)^4/g^5B*b/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{3*a+2/9}$   
 $e^{3*d*i}/(a*d-b*c)^4/g^5B*b^2/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{3*c+1/4}$   
 $e^{4*d*i}/(a*d-b*c)^4/g^5B*b^2/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{4*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))}$   
 $a-1/4*e^{4*i}/(a*d-b*c)^4/g^5B*b^3/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{4*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))}$   
 $c+1/16*e^{4*d*i}/(a*d-b*c)^4/g^5B*b^2/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{4*a-1/16}$   
 $e^{4*i}/(a*d-b*c)^4/g^5B*b^3/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{4*c}$

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In]  $\text{integrate}((d*i*x+c*i)*(A+B*\log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5,x, \text{algorithm}="maxima")$

[Out]  $-\frac{1}{144}B*d*i*(12*(4*b*x + a)*\log(b*e*x/(d*x + c) + a*e/(d*x + c)))/(b^6*g^5*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g^5)$   
 $+ (7*a*b^3*c^3 - 33*a^2*b^2*c^2*d + 75*a^3*b*c*d^2 - 13*a^4*d^3 + 12*(4*b^4*c*d^2 - a*b^3*d^3))*x^3 - 6*(4*b^4*c^2*d - 29*a*b^3*c*d^2 + 7*a^2*b^2*d^3)*x^2$   
 $+ 4*(4*b^4*c^3 - 21*a*b^3*c^2*d + 57*a^2*b^2*c*d^2 - 13*a^3*b*d^3)*x)/(b^9*c^3 - 3*a*b^8*c^2*d + 3*a^2*b^7*c*d^2 - a^3*b^6*d^3)*g^5*x^4 + 4*(a*b^8*c^3 - 3*a^2*b^7*c^2*d + 3*a^3*b^6*c*d^2 - a^4*b^5*d^3)*g^5*x^3 + 6*(a^2*b$

$$\begin{aligned} & ^7c^3 - 3a^3b^6c^2d + 3a^4b^5c^2d^2 - a^5b^4d^3)g^5x^2 + 4(a^3b^6c^3 - 3a^4b^5c^2d + 3a^5b^4c^2d^2 - a^6b^3d^3)g^5x + (a^4b^5c^3 - 3a^5b^4c^2d + 3a^6b^3c^2d^2 - a^7b^2d^3)g^5) + 12(4b^3c^2d^3 - a^4d^4) \log(bx + a) / ((b^6c^4 - 4a^2b^5c^3d + 6a^2b^4c^2d^2 - 4a^3b^3c^2d^3 + a^4b^2d^4)g^5) - 12(4b^3c^2d^3 - a^4d^4) \log(dx + c) / ((b^6c^4 - 4a^2b^5c^3d + 6a^2b^4c^2d^2 - 4a^3b^3c^2d^3 + a^4b^2d^4)g^5)) + 1/48B^3c^3i((12b^3d^3x^3 - 3b^3c^3 + 13a^2b^2c^2d - 23a^2b^2c^2d^2 + 25a^3d^3 - 6(b^3c^2d^2 - 7a^2b^2d^3)x^2 + 4(b^3c^2d - 5a^2b^2c^2d^2 + 13a^2b^2d^3)x) / ((b^8c^3 - 3a^2b^7c^2d + 3a^2b^6c^2d^2 - a^3b^5d^3)g^5x^4 + 4(a^2b^7c^3 - 3a^2b^6c^2d + 3a^3b^5c^2d^2 - a^4b^4d^3)g^5x^3 + 6(a^2b^6c^3 - 3a^3b^5c^2d + 3a^4b^4c^2d^2 - a^5b^3d^3)g^5x^2 + 4(a^3b^5c^3 - 3a^4b^4c^2d + 3a^5b^3c^2d^2 - a^6b^2d^3)g^5x + (a^4b^4c^3 - 3a^5b^3c^2d + 3a^6b^2c^2d^2 - a^7b^2d^3)g^5) - 12 \log(b^3e^3x / (dx + c) + a^3e / (dx + c)) / (b^5g^5x^4 + 4a^2b^4g^5x^3 + 6a^2b^3g^5x^2 + 4a^3b^2g^5x + a^4b^2g^5) + 12d^4 \log(bx + a) / ((b^5c^4 - 4a^2b^4c^3d + 6a^2b^3c^2d^2 - 4a^3b^2c^2d^3 + a^4b^2d^4)g^5) - 12d^4 \log(dx + c) / ((b^5c^4 - 4a^2b^4c^3d + 6a^2b^3c^2d^2 - 4a^3b^2c^2d^3 + a^4b^2d^4)g^5)) - 1/12(4b^3x + a)A^3d^3i / (b^6g^5x^4 + 4a^2b^5g^5x^3 + 6a^2b^4g^5x^2 + 4a^3b^3g^5x + a^4b^2g^5) - 1/4A^3c^3i / (b^5g^5x^4 + 4a^2b^4g^5x^3 + 6a^2b^3g^5x^2 + 4a^3b^2g^5x + a^4b^2g^5) \end{aligned}$$

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

$$*d^3)*g^5*x^3 + 6*(a^2*b^7*c^3 - 3*a^3*b^6*c^2*d + 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)*g^5*x^2 + 4*(a^3*b^6*c^3 - 3*a^4*b^5*c^2*d + 3*a^5*b^4*c*d^2 - a^6*b^3*d^3)*g^5*x + (a^4*b^5*c^3 - 3*a^5*b^4*c^2*d + 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*g^5)$$

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\frac{Bd^4 \log(bx + a)}{12(b^5c^3g^5i - 3ab^4c^2dg^5i + 3a^2b^3cd^2g^5i - a^3b^2d^3g^5i)} - \frac{Bd^4 \log(dx + c)}{12(b^5c^3g^5i - 3ab^4c^2dg^5i + 3a^2b^3cd^2g^5i - a^3b^2d^3g^5i)} - \frac{1}{12(b^6g^5)}$$



Verification of antiderivative is not currently implemented for this CAS.

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

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

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

**Optimal.** Leaf size=423

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

[Out]  $(B*(b*c - a*d)^5*g^3*i^2*x)/(60*b^2*d^3) + (B*(b*c - a*d)^4*g^3*i^2*(c + d*x)^2)/(120*b*d^4) - (19*B*(b*c - a*d)^3*g^3*i^2*(c + d*x)^3)/(180*d^4) + (13*b*B*(b*c - a*d)^2*g^3*i^2*(c + d*x)^4)/(120*d^4) - (b^2*B*(b*c - a*d)*g^3*i^2*(c + d*x)^5)/(30*d^4) + (B*(b*c - a*d)^6*g^3*i^2*Log[(a + b*x)/(c + d*x)])/(60*b^3*d^4) - ((b*c - a*d)^3*g^3*i^2*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*d^4) + (3*b*(b*c - a*d)^2*g^3*i^2*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(4*d^4) - (3*b^2*(b*c - a*d)*g^3*i^2*(c + d*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(5*d^4) + (b^3*g^3*i^2*(c + d*x)^6*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(6*d^4) + (B*(b*c - a*d)^6*g^3*i^2*Log[c + d*x])/(60*b^3*d^4)$

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

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

Antiderivative was successfully verified.

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

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

Rule 2528

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

### Rule 2525

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

### Rule 12

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

### Rule 43

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

### Rubi steps

$$\begin{aligned}
\int (10c + 10dx)^2(ag + bgx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) dx &= \int \left( \frac{100(bc - ad)^2(ag + bgx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2} + \frac{200d(bc - ad)(ag + bgx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2} \right) dx \\
&= \frac{(100(bc - ad)^2) \int (ag + bgx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) dx}{b^2} + \frac{(100d(bc - ad)) \int (ag + bgx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) dx}{b^2} \\
&= \frac{25(bc - ad)^2 g^3 (a + bx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3} + \frac{40d(bc - ad) g^3 (a + bx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3} \\
&= \frac{25(bc - ad)^2 g^3 (a + bx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3} + \frac{40d(bc - ad) g^3 (a + bx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3} \\
&= \frac{25(bc - ad)^2 g^3 (a + bx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3} + \frac{40d(bc - ad) g^3 (a + bx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3} \\
&= -\frac{5B(bc - ad)^5 g^3 x}{3b^2 d^3} + \frac{5B(bc - ad)^4 g^3 (a + bx)^2}{6b^3 d^2} - \frac{5B(bc - ad)^3 g^3 (a + bx)}{9b^3 d}
\end{aligned}$$

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

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

Antiderivative was successfully verified.

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

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

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

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] result too large to display

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In]  $\text{integrate}((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*\log(e*(b*x+a)/(d*x+c))),x, \text{algorithm}="maxima")$

[Out]  $\frac{1}{6}A*b^3*d^2*g^3*i^2*x^6 + \frac{2}{5}A*b^3*c*d*g^3*i^2*x^5 + \frac{3}{5}A*a*b^2*d^2*g^3*i^2*x^5 + \frac{1}{4}A*b^3*c^2*g^3*i^2*x^4 + \frac{3}{2}A*a*b^2*c*d*g^3*i^2*x^4 + \frac{3}{4}A*a^2*b*d^2*g^3*i^2*x^4 + A*a*b^2*c^2*g^3*i^2*x^3 + 2A*a^2*b*c*d*g^3*i^2*x^3 + \frac{1}{3}A*a^3*d^2*g^3*i^2*x^3 + \frac{3}{2}A*a^2*b*c^2*g^3*i^2*x^2 + A*a^3*c*d*g^3*i^2*x^2 + (x*\log(b*e*x/(d*x + c)) + a*e/(d*x + c)) + a*\log(b*x + a)/b - c*\log(d*x + c)/d)*B*a^3*c^2*g^3*i^2 + \frac{3}{2}*(x^2*\log(b*e*x/(d*x + c)) + a*e/(d*x + c)) - a^2*\log(b*x + a)/b^2 + c^2*\log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*B*a^2*b*c^2*g^3*i^2 + \frac{1}{2}*(2*x^3*\log(b*e*x/(d*x + c)) + a*e/(d*x + c)) + 2*a^3*\log(b*x + a)/b^3 - 2*c^3*\log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*a*b^2*c^2*g^3*i^2 + \frac{1}{24}*(6*x^4*\log(b*e*x/(d*x + c)) + a*e/(d*x + c)) - 6*a^4*\log(b*x + a)/b^4 + 6*c^4*\log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*b^3*c^2*g^3*i^2 + (x^2*\log(b*e*x/(d*x + c)) + a*e/(d*x + c)) - a^2*\log(b*x + a)/b^2 + c^2*\log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*B*a^3*c*d*g^3*i^2 + (2*x^3*\log(b*e*x/(d*x + c)) + a*e/(d*x + c)) + 2*a^3*\log(b*x + a)/b^3 - 2*c^3*\log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*a^2*b*c*d*g^3*i^2 + \frac{1}{4}*(6*x^4*\log(b*e*x/(d*x + c)) + a*e/(d*x + c)) - 6*a^4*\log(b*x + a)/b^4 + 6*c^4*\log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*a*b^2*c*d*g^3*i^2 + \frac{1}{30}*(12*x^5*\log(b*e*x/(d*x + c)) + a*e/(d*x + c)) + 12*a^5*\log(b*x + a)/b^5 - 12*c^5*\log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d$

$$\begin{aligned} &^4) * B * b^3 * c * d * g^3 * i^2 + 1/6 * (2 * x^3 * \log(b * e * x / (d * x + c)) + a * e / (d * x + c)) + \\ &2 * a^3 * \log(b * x + a) / b^3 - 2 * c^3 * \log(d * x + c) / d^3 - ((b^2 * c * d - a * b * d^2) * x^2 \\ &- 2 * (b^2 * c^2 - a^2 * d^2) * x) / (b^2 * d^2)) * B * a^3 * d^2 * g^3 * i^2 + 1/8 * (6 * x^4 * \log(b * \\ &e * x / (d * x + c)) + a * e / (d * x + c)) - 6 * a^4 * \log(b * x + a) / b^4 + 6 * c^4 * \log(d * x + c) \\ &/ d^4 - (2 * (b^3 * c * d^2 - a * b^2 * d^3) * x^3 - 3 * (b^3 * c^2 * d - a^2 * b * d^3) * x^2 + 6 * \\ &(b^3 * c^3 - a^3 * d^3) * x) / (b^3 * d^3)) * B * a^2 * b * d^2 * g^3 * i^2 + 1/20 * (12 * x^5 * \log(b * \\ &e * x / (d * x + c)) + a * e / (d * x + c)) + 12 * a^5 * \log(b * x + a) / b^5 - 12 * c^5 * \log(d * x + \\ &c) / d^5 - (3 * (b^4 * c * d^3 - a * b^3 * d^4) * x^4 - 4 * (b^4 * c^2 * d^2 - a^2 * b^2 * d^4) * x^3 \\ &+ 6 * (b^4 * c^3 * d - a^3 * b * d^4) * x^2 - 12 * (b^4 * c^4 - a^4 * d^4) * x) / (b^4 * d^4)) * B * \\ &a * b^2 * d^2 * g^3 * i^2 + 1/360 * (60 * x^6 * \log(b * e * x / (d * x + c)) + a * e / (d * x + c)) - 60 \\ &* a^6 * \log(b * x + a) / b^6 + 60 * c^6 * \log(d * x + c) / d^6 - (12 * (b^5 * c * d^4 - a * b^4 * d^5) * x^5 \\ &- 15 * (b^5 * c^2 * d^3 - a^2 * b^3 * d^5) * x^4 + 20 * (b^5 * c^3 * d^2 - a^3 * b^2 * d^5) * x^3 \\ &- 30 * (b^5 * c^4 * d - a^4 * b * d^5) * x^2 + 60 * (b^5 * c^5 - a^5 * d^5) * x) / (b^5 * d^5) \\ &)) * B * b^3 * d^2 * g^3 * i^2 + A * a^3 * c^2 * g^3 * i^2 * x \end{aligned}$$

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

$$60 A b^6 d^6 g^3 i^2 x^6 + 12 \left( (12 A - B) b^6 c d^5 + (18 A + B) a b^5 d^6 \right) g^3 i^2 x^5 + 3 \left( (30 A - 7 B) b^6 c^2 d^4 + 6 (30 A - B) a b^5 c d^5 + (90 A + \right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

[Out]  $A*b**3*d**2*g**3*i**2*x**6/6 + B*a**4*g**3*i**2*(a**2*d**2 - 6*a*b*c*d + 15*b**2*c**2)*\log(x + (B*a**6*c*d**5*g**3*i**2 - 6*B*a**5*b*c**2*d**4*g**3*i**2 + B*a**5*d**4*g**3*i**2*(a**2*d**2 - 6*a*b*c*d + 15*b**2*c**2)/b + 35*B*a**4*b**2*c**3*d**3*g**3*i**2 - B*a**4*c*d**3*g**3*i**2*(a**2*d**2 - 6*a*b*c*d + 15*b**2*c**2) - 15*B*a**3*b**3*c**4*d**2*g**3*i**2 + 6*B*a**2*b**4*c**5*d*g**3*i**2 - B*a*b**5*c**6*g**3*i**2)/(B*a**6*d**6*g**3*i**2 - 6*B*a**5*b*c*d**5*g**3*i**2 + 15*B*a**4*b**2*c**2*d**4*g**3*i**2 + 20*B*a**3*b**3*c**3*d**3*g**3*i**2 - 15*B*a**2*b**4*c**4*d**2*g**3*i**2 + 6*B*a*b**5*c**5*d*g**3*i**2 - B*b**6*c**6*g**3*i**2))/(60*b**3) - B*c**3*g**3*i**2*(20*a**3*d**3 - 15*a**2*b*c*d**2 + 6*a*b**2*c**2*d - b**3*c**3)*\log(x + (B*a**6*c*d**5*g**3*i**2 - 6*B*a**5*b*c**2*d**4*g**3*i**2 + 35*B*a**4*b**2*c**3*d**3*g**3*i**2 - 15*B*a**3*b**3*c**4*d**2*g**3*i**2 + 6*B*a**2*b**4*c**5*d*g**3*i**2 - B*a*b**5*c**6*g**3*i**2 - B*a*b**2*c**3*g**3*i**2*(20*a**3*d**3 - 15*a**2*b*c*d**2 + 6*a*b**2*c**2*d - b**3*c**3) + B*b**3*c**4*g**3*i**2*(20*a**3*d**3 - 15*a**2*b*c*d**2 + 6*a*b**2*c**2*d - b**3*c**3)/d)/(B*a**6*d**6*g**3*i**2 - 6*B*a**5*b*c*d**5*g**3*i**2 + 15*B*a**4*b**2*c**2*d**4*g**3*i**2 + 20*B*a**3*b**3*c**3*d**3*g**3*i**2 - 15*B*a**2*b**4*c**4*d**2*g**3*i**2 + 6*B*a*b**5*c**5*d*g**3*i**2 - B*b**6*c**6*g**3*i**2))/(60*d**4) + x**5*(3*A*a*b**2*d**2*g**3*i**2/5 + 2*A*b**3*c*d*g**3*i**2/5 + B*a*b**2*d**2*g**3*i**2/30 - B*b**3*c*d*g**3*i**2/30) + x**4*(3*A*a**2*b*d**2*g**3*i**2/4 + 3*A*a*b**2*c*d*g**3*i**2/2 + A*b**3*c**2*g**3*i**2/4 + 13*B*a**2*b*d**2*g**3*i**2/120 - B*a*b**2*c*d*g**3*i**2/20 - 7*B*b**3*c**2*g**3*i**2/120) + (B*a**3*c**2*g**3*i**2*x + B*a**3*c*d*g**3*i**2*x**2 + B*a**3*d**2*g**3*i**2*x**3/3 + 3*B*a**2*b*c**2*g**3*i**2*x**2/2 + 2*B*a**2*b*c*d*g**3*i**2*x**3 + 3*B*a**2*b*d**2*g**3*i**2*x**4/4 + B*a*b**2*c**2*g**3*i**2*x**3 + 3*B*a*b**2*c*d*g**3*i**2*x**4/2 + 3*B*a*b**2*d**2*g**3*i**2*x**5/5 + B*b**3*c**2*g**3*i**2*x**4/4 + 2*B*b**3*c*d*g**3*i**2*x**5/5 + B*b**3*d**2*g**3*i**2*x**6/6)*\log(e*(a + b*x)/(c + d*x)) + x**3*(60*A*a**3*d**3*g**3*i**2 + 360*A*a**2*b*c*d**2*g**3*i**2 + 180*A*a*b**2*c**2*d*g**3*i**2 + 19*B*a**3*d**3*g**3*i**2 + 21*B*a**2*b*c*d**2*g**3*i**2 - 39*B*a*b**2*c**2*d*g**3*i**2 - B*b**3*c**3*g**3*i**2)/(180*d) + x**2*(120*A*a**3*b*c*d**3*g**3*i**2 + 180*A*a**2*b**2*c**2*d**2*g**3*i**2 + B*a**4*d**4*g**3*i**2 + 34*B*a**3*b*c*d**3*g**3*i**2 - 30*B*a**2*b**2*c**2*d**2*g**3*i**2 - 6*B*a*b**3*c**3*d*g**3*i**2 + B*b**4*c**4*g**3*i**2)/(120*b*d**2) - x*(-60*A*a**3*b**2*c**2*d**3*g**3*i**2 + B*a**5*d**5*g**3*i**2 - 6*B*a**4*b*c*d**4*g**3*i**2 - 5*B*a**3*b**2*c**2*d**3*g**3*i**2 + 15*B*a**2*b**3*c**3*d**2*g**3*i**2 - 6*B*a*b**4*c**4*d*g**3$

$$i^{**2} + B*b^{**5}*c^{**5}*g^{**3}*i^{**2})/(60*b^{**2}*d^{**3})$$

---

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```



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

**Optimal.** Leaf size=337

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

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

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

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

Antiderivative was successfully verified.

[In]  $\text{Int}[(a*g + b*g*x)^2*(c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]), x]$

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

#### Rule 2528

$\text{Int}[(a_.) + \text{Log}[(c_.)*(RfX_)^(p_.)]*(b_.)^(n_.)*(RGx_), x\_Symbol] \rightarrow \text{With}[\{u = \text{ExpandIntegrand}[(a + b*\text{Log}[c*RfX^p])^n, RGx, x]\}, \text{Int}[u, x] /; \text{SumQ}[u]] /; \text{FreeQ}\{a, b, c, p\}, x] \&\& \text{RationalFunctionQ}[RfX, x] \&\& \text{RationalFunctionQ}[RGx, x]$

onQ[RGx, x] && IGtQ[n, 0]

### Rule 2525

Int[((a\_.) + Log[(c\_.)\*(Rfx\_)^(p\_.)]\*(b\_.))^(n\_.)\*((d\_.) + (e\_.)\*(x\_))^(m\_.), x\_Symbol] := Simp[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*Rfx^p])^n)/(e\*(m + 1)), x] - Dist[(b\*n\*p)/(e\*(m + 1)), Int[SimplifyIntegrand[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*Rfx^p])^(n - 1)\*D[Rfx, x])/Rfx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

### Rule 12

Int[(a\_)\*(u\_), x\_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b\_)\*(v\_) /; FreeQ[b, x]]

### Rule 43

Int[((a\_.) + (b\_.)\*(x\_))^(m\_.)\*((c\_.) + (d\_.)\*(x\_))^(n\_.), x\_Symbol] := Int[ExpandIntegrand[(a + b\*x)^m\*(c + d\*x)^n, x], x] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b\*c - a\*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && LeQ[7\*m + 4\*n + 4, 0]) || LtQ[9\*m + 5\*(n + 1), 0] || GtQ[m + n + 2, 0])

### Rubi steps

$$\begin{aligned}
 \int (11c + 11dx)^2 (ag + bgx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) dx &= \int \left( \frac{(-bc + ad)^2 g^2 (11c + 11dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{d^2} - \frac{2b(bc - ad)}{d} \right) dx \\
 &= \frac{(b^2 g^2) \int (11c + 11dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) dx}{121d^2} - \frac{(2b(bc - ad)) \int (11c + 11dx)^4 dx}{121d^2} \\
 &= \frac{121(bc - ad)^2 g^2 (c + dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{3d^3} - \frac{121b(bc - ad) \int (11c + 11dx)^4 dx}{3d^3} \\
 &= \frac{121(bc - ad)^2 g^2 (c + dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{3d^3} - \frac{121b(bc - ad) \int (11c + 11dx)^4 dx}{3d^3} \\
 &= \frac{121(bc - ad)^2 g^2 (c + dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{3d^3} - \frac{121b(bc - ad) \int (11c + 11dx)^4 dx}{3d^3} \\
 &= -\frac{121B(bc - ad)^4 g^2 x}{30b^2 d^2} - \frac{121B(bc - ad)^3 g^2 (c + dx)^2}{60bd^3} + \frac{121B(bc - ad)^2 g^2 (c + dx)}{60bd^3}
 \end{aligned}$$

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

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


---

Antiderivative was successfully verified.

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

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

---

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

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] result too large to display

---

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

---

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

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


---

Verification of antiderivative is not currently implemented for this CAS.

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

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

$$2i^2 \log(bx + a) - 2(Bb^5c^5 - 5Bab^4c^4d + 10Ba^2b^3c^3d^2) \\ *g^2i^2 \log(dx + c) + 2(6Bb^5d^5g^2i^2x^5 + 30Ba^2b^3c^2d^3g^2i^2x \\ + 15(Bb^5cd^4 + Bab^4d^5)g^2i^2x^4 + 10(Bb^5c^2d^3 + \\ 4Bab^4cd^4 + Ba^2b^3d^5)g^2i^2x^3 + 30(Bab^4c^2d^3 + Ba^2 \\ b^3cd^4)g^2i^2x^2) \log((bex + ae)/(dx + c)) / (b^3d^3)$$

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

---

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

$$3.12 \quad \int (ag + bgx)(ci + dix)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) dx$$

**Optimal.** Leaf size=239

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

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

**Rubi [A]** time = 0.341305, antiderivative size = 200, normalized size of antiderivative = 0.84, number of steps used = 10, number of rules used = 4, integrand size = 38,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.105$ , Rules used = {2528, 2525, 12, 43}

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

Antiderivative was successfully verified.

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

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

### Rule 2528

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

### Rule 2525

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

### Rule 12

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

### Rule 43

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

### Rubi steps

$$\begin{aligned} \int (12c + 12dx)^2 (ag + bgx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) dx &= \int \left( \frac{(-bc + ad)g(12c + 12dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{d} + \frac{bg(12c + 12dx)^2}{d} \right) dx \\ &= \frac{(bg) \int (12c + 12dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) dx}{12d} + \frac{((-bc + ad)g) \int (12c + 12dx)^2 dx}{12d} \\ &= -\frac{48(bc - ad)g(c + dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{d^2} + \frac{36bg(c + dx)^4}{d^2} \\ &= -\frac{48(bc - ad)g(c + dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{d^2} + \frac{36bg(c + dx)^4}{d^2} \\ &= -\frac{48(bc - ad)g(c + dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{d^2} + \frac{36bg(c + dx)^4}{d^2} \\ &= \frac{12B(bc - ad)^3 gx}{b^2 d} + \frac{6B(bc - ad)^2 g(c + dx)^2}{bd^2} - \frac{12B(bc - ad)g(c + dx)^2}{d^2} \end{aligned}$$



**Mathematica [A]** time = 0.182512, size = 216, normalized size = 0.9

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

Antiderivative was successfully verified.

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

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

**Maple [B]** time = 0.173, size = 3439, normalized size = 14.4

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] 1/24\*e^2/d^2\*B\*g\*i^2\*b^3/(d\*e/(d\*x+c)\*a-e/(d\*x+c)\*b\*c)^2\*c^4-1/12\*e\*d^2\*B\*g\*i^2/b^2/(d\*e/(d\*x+c)\*a-e/(d\*x+c)\*b\*c)\*a^4+1/4\*e^4\*d^2\*A\*g\*i^2\*b/(d\*e/(d\*x+c)\*a-e/(d\*x+c)\*b\*c)^4\*a^4-1/6\*e^2\*d\*B\*g\*i^2/(d\*e/(d\*x+c)\*a-e/(d\*x+c)\*b\*c)^2\*a^3\*c+1/3\*e^3\*d^2\*B\*g\*i^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))/(d\*e/(d\*x+c)\*a-e/(d\*x+c)\*b\*c)^3\*a^4+1/3\*d\*B\*g\*i^2/b^2\*ln(d\*(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))-b\*e)\*a^3\*c+1/24\*e^2\*d^2\*B\*g\*i^2/b/(d\*e/(d\*x+c)\*a-e/(d\*x+c)\*b\*c)^2\*a^4+1/12\*e^3/d^2\*B\*g\*i^2/(d\*e/(d\*x+c)\*a-e/(d\*x+c)\*b\*c)^3\*b^4\*c^4+1/3\*e^3/d^2\*A\*g\*i^2/(d\*e/(d\*x+c)\*a-e/(d\*x+c)\*b\*c)^3\*b^4\*c^4+1/4\*e^4/d^2\*A\*g\*i^2\*b^5/(d\*e/(d\*x+c)\*a-e/(d\*x+c)\*b\*c)^4\*c^4-1/12\*e/d^2\*B\*g\*i^2\*b^2/(d\*e/(d\*x+c)\*a-e/(d\*x+c)\*b\*c)\*c^4+2\*e^3\*A\*g\*i^2/(d\*e/(d\*x+c)\*a-e/(d\*x+c)\*b\*c)^3\*a^2\*b^2\*c^2+3/2\*e^4\*A\*g\*i^2\*b^3/(d\*e/(d\*x+c)\*a-e/(d\*x+c)\*b\*c)^4\*a^2\*c^2+1/2\*e^3\*B\*g\*i^2/(d\*e/(d\*x+c)\*a-e/(d\*x+c)\*b\*c)^3\*a^2\*b^2\*c^2+1/4\*e^2\*B\*g\*i^2/(d\*e/(d\*x+c)\*a-e/(d\*x+c)\*b\*c)^2\*a^2\*c^2\*b-1/4\*e^4\*d^6\*B\*g\*i^2/b^3\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))/(d\*e/(d\*x+c)\*a-e/(d\*x+c)\*b\*c)^4\*a^8/(d\*x+c)^4+14\*e^4\*d^3\*B\*g\*i^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))/(d\*e/(d\*x+c)\*a-e/(d\*x+c)\*b\*c)^4\*c^3/(d\*x+c)^4\*a^5-1/2\*B\*g\*i^2/b\*ln(d\*(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))-b\*e)\*a^2\*c^2+1/12\*e^3\*d^2\*B\*g\*i^2/(d\*e/(d\*x+c)\*a-e/(d\*x+c)\*b\*c)^3\*a^4+1/3/d\*B\*g\*i^2\*ln(d\*(b\*e/d+(a\*d-b\*c)\*

$$\begin{aligned}
& e/d/(d*x+c))-b*e)*c^3*a^{-1}/12*d^2*B*g*i^2/b^3*\ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^4-1/12/d^2*B*g*i^2*\ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c^4* \\
& b^{-1}/2*e*B*g*i^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2*c^2+1/3*e^3*d^2*A*g*i^2/( \\
& d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^4+35/3*e^3*d*B*g*i^2*\ln(b*e/d+(a*d-b*c)*e/ \\
& d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^3*c^4/(d*x+c)^3*b+14*e^4*d*B*g \\
& *i^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*c^5/(d \\
& *x+c)^4*a^3*b^2+7/3*e^3/d*B*g*i^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x \\
& +c)*a-e/(d*x+c)*b*c)^3*c^6/(d*x+c)^3*b^3*a+2*e^4*d^5*B*g*i^2/b^2*\ln(b*e/d+( \\
& a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^7/(d*x+c)^4*c+2*e^4 \\
& /d*B*g*i^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4* \\
& c^7/(d*x+c)^4*b^4*a-35/2*e^4*d^2*B*g*i^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d \\
& *e/(d*x+c)*a-e/(d*x+c)*b*c)^4*c^4/(d*x+c)^4*a^4*b-7*e^4*d^4*B*g*i^2/b*\ln(b* \\
& e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^6/(d*x+c)^4*c^ \\
& 2-7/3*e^3*d^4*B*g*i^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/b^2/(d*e/(d*x+c)*a-e/ \\
& (d*x+c)*b*c)^3*a^6*c/(d*x+c)^3+7*e^3*d^3*B*g*i^2*\ln(b*e/d+(a*d-b*c)*e/d/(d* \\
& x+c))/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^5*c^2/(d*x+c)^3+1/3*e*d*B*g*i^2/b \\
& /(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^3*c+1/3*e/d*B*g*i^2*b/(d*e/(d*x+c)*a-e/(d* \\
& x+c)*b*c)*c^3*a-e^4/d*A*g*i^2*b^4/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*c^3*a-1/3 \\
& *e^3/d^2*B*g*i^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b \\
& *c)^3*c^7/(d*x+c)^3*b^4-1/4*e^4/d^2*B*g*i^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)) \\
& /(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*c^8/(d*x+c)^4*b^5-7*e^3*B*g*i^2*\ln(b*e/d+( \\
& a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^5/(d*x+c)^3*a^2*b^2 \\
& -7*e^4*B*g*i^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c \\
& )^4*c^6/(d*x+c)^4*a^2*b^3-e^4*d*B*g*i^2*b^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)) \\
& /(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^3*c-e^4/d*B*g*i^2*b^4*\ln(b*e/d+(a*d-b*c) \\
& *e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*c^3*a-4/3*e^3*d*B*g*i^2*\ln(b* \\
& e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^3*b*c+1/3*e^3* \\
& d^5*B*g*i^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b* \\
& c)^3*a^7/(d*x+c)^3-35/3*e^3*d^2*B*g*i^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d* \\
& e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^4*c^3/(d*x+c)^3-4/3*e^3/d*B*g*i^2*\ln(b*e/d+( \\
& a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a*c^3*b^3-1/3*e^3*d*B \\
& *g*i^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^3*b*c-4/3*e^3*d*A*g*i^2/(d*e/(d*x+ \\
& c)*a-e/(d*x+c)*b*c)^3*a^3*b*c-1/3*e^3/d*B*g*i^2/(d*e/(d*x+c)*a-e/(d*x+c)*b* \\
& c)^3*b^3*c^3*a-1/6*e^2/d*B*g*i^2*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^3*a- \\
& 4/3*e^3/d*A*g*i^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*b^3*c^3*a-e^4*d*A*g*i^2*b \\
& ^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^3*c+3/2*e^4*B*g*i^2*\ln(b*e/d+(a*d-b*c) \\
& *e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^2*b^3*c^2+2*e^3*B*g*i^2*\ln( \\
& b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^2*c^2*b^2+1/ \\
& 4*e^4/d^2*B*g*i^2*b^5*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x \\
& +c)*b*c)^4*c^4+1/3*e^3/d^2*B*g*i^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^4/(d*e \\
& /(d*x+c)*a-e/(d*x+c)*b*c)^3*c^4+1/4*e^4*d^2*B*g*i^2*b*\ln(b*e/d+(a*d-b*c)*e/ \\
& d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^4
\end{aligned}$$

**Maxima [B]** time = 1.53032, size = 906, normalized size = 3.79

$$\frac{1}{4} Abd^2 gi^2 x^4 + \frac{2}{3} Abcd gi^2 x^3 + \frac{1}{3} Aad^2 gi^2 x^3 + \frac{1}{2} Abc^2 gi^2 x^2 + Aacd gi^2 x^2 + \left( x \log \left( \frac{bex}{dx+c} + \frac{ae}{dx+c} \right) + \frac{a \log(bx+a)}{b} \right) -$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out]  $\frac{1}{4} A b d^2 g i^2 x^4 + \frac{2}{3} A b c d g i^2 x^3 + \frac{1}{3} A a d^2 g i^2 x^3 + \frac{1}{2} A b c^2 g i^2 x^2 + A a c d g i^2 x^2 + (x \log(\frac{b e x}{d x+c} + \frac{a e}{d x+c}) + \frac{a \log(b x+a)}{b} - c \log(d x+c)/d) B b a c^2 g i^2 + \frac{1}{2} (x^2 \log(\frac{b e x}{d x+c} + \frac{a e}{d x+c}) - a^2 \log(b x+a)/b^2 + c^2 \log(d x+c)/d^2 - (b c - a d) x/(b d)) B b c^2 g i^2 + (x^2 \log(\frac{b e x}{d x+c} + \frac{a e}{d x+c}) - a^2 \log(b x+a)/b^2 + c^2 \log(d x+c)/d^2 - (b c - a d) x/(b d)) B a c d g i^2 + \frac{1}{3} (2 x^3 \log(\frac{b e x}{d x+c} + \frac{a e}{d x+c}) + 2 a^3 \log(b x+a)/b^3 - 2 c^3 \log(d x+c)/d^3 - ((b^2 c d - a b d^2) x^2 - 2 (b^2 c^2 - a^2 d^2) x)/(b^2 d^2)) B b c d g i^2 + \frac{1}{6} (2 x^3 \log(\frac{b e x}{d x+c} + \frac{a e}{d x+c}) + 2 a^3 \log(b x+a)/b^3 - 2 c^3 \log(d x+c)/d^3 - ((b^2 c d - a b d^2) x^2 - 2 (b^2 c^2 - a^2 d^2) x)/(b^2 d^2)) B a d^2 g i^2 + \frac{1}{24} (6 x^4 \log(\frac{b e x}{d x+c} + \frac{a e}{d x+c}) - 6 a^4 \log(b x+a)/b^4 + 6 c^4 \log(d x+c)/d^4 - (2 (b^3 c d^2 - a b^2 d^3) x^3 - 3 (b^3 c^2 d - a^2 b d^3) x^2 + 6 (b^3 c^3 - a^3 d^3) x)/(b^3 d^3)) B b d^2 g i^2 + A a c^2 g i^2 x$

**Fricas [A]** time = 1.54713, size = 774, normalized size = 3.24

$$6 A b^4 d^4 g i^2 x^4 + 2 ((8 A - B) b^4 c d^3 + (4 A + B) a b^3 d^4) g i^2 x^3 + ((12 A - 5 B) b^4 c^2 d^2 + 4 (6 A + B) a b^3 c d^3 + B a^2 b^2 d^4) g i^2 x^2 -$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out]  $\frac{1}{24} (6 A b^4 d^4 g i^2 x^4 + 2 ((8 A - B) b^4 c d^3 + (4 A + B) a b^3 d^4) g i^2 x^3 + ((12 A - 5 B) b^4 c^2 d^2 + 4 (6 A + B) a b^3 c d^3 + B a^2 b^2 d^4) g i^2 x^2 - 2 (B b^4 c^3 d - 2 (6 A - B) a b^3 c^2 d^2 - 4 B a^2 b^2 c d^3 + B a^3 b d^4) g i^2 x + 2 (6 B a^2 b^2 c^2 d^2 - 4 B a^3 b c d^3 + B a^4 d^4) g i^2 \log(b x+a) + 2 (B b^4 c^4 - 4 B a b^3 c^3 d) g i^2 \log(d$

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

**Sympy [B]** time = 6.60334, size = 870, normalized size = 3.64

$$\frac{Abd^2gi^2x^4}{4} + \frac{Ba^2gi^2(a^2d^2 - 4abcd + 6b^2c^2) \log\left(x + \frac{Ba^4cd^3gi^2 - 4Ba^3bc^2d^2gi^2 + \frac{Ba^3d^2gi^2(a^2d^2 - 4abcd + 6b^2c^2)}{b} + 10Ba^2b^2c^3dgi^2 - Ba^2cdgi^2(a^2d^2 - 4abcd + 6b^2c^2)}{Ba^4d^4gi^2 - 4Ba^3bcd^3gi^2 + 6Ba^2b^2c^2d^2gi^2 + 4Bab^3c^3dgi^2 - Bb^4c^4gi^2}\right)}{12b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

**Giac [A]** time = 14.4937, size = 441, normalized size = 1.85

$$-\frac{1}{4}(Abd^2g + Bbd^2g)x^4 - \frac{1}{12}(8Abcdg + 7Bbcdg + 4Aad^2g + 5Bad^2g)x^3 - \frac{(12Ab^2c^2g + 7Bb^2c^2g + 24Aabcdg + 28Babcdg)}{24b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] 
$$-1/4*(A*b*d^2*g + B*b*d^2*g)*x^4 - 1/12*(8*A*b*c*d*g + 7*B*b*c*d*g + 4*A*a*d^2*g + 5*B*a*d^2*g)*x^3 - 1/24*(12*A*b^2*c^2*g + 7*B*b^2*c^2*g + 24*A*a*b*c*d*g + 28*B*a*b*c*d*g + B*a^2*d^2*g)*x^2/b - 1/12*(3*B*b*d^2*g*x^4 + 12*B*a*c^2*g*x + 4*(2*B*b*c*d*g + B*a*d^2*g)*x^3 + 6*(B*b*c^2*g + 2*B*a*c*d*g)*x^2)*\log((b*x + a)/(d*x + c)) - 1/12*(B*b*c^4*g - 4*B*a*c^3*d*g)*\log(-d*x - c)/d^2 + 1/12*(B*b^3*c^3*g - 12*A*a*b^2*c^2*d*g - 10*B*a*b^2*c^2*d*g - 4*B*a^2*b*c*d^2*g + B*a^3*d^3*g)*x/(b^2*d) - 1/12*(6*B*a^2*b^2*c^2*g - 4*B*a^3*b*c*d*g + B*a^4*d^2*g)*\log(b*x + a)/b^3$$

### 3.13 $\int (ci + dix)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) dx$

**Optimal.** Leaf size=118

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

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

**Rubi [A]** time = 0.0668842, antiderivative size = 118, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 30,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.1$ , Rules used = {2525, 12, 43}

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

Antiderivative was successfully verified.

[In]  $\text{Int}[(c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]), x]$

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

#### Rule 2525

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

#### Rule 12

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

Rule 43

Int[((a\_.) + (b\_.)\*(x\_))^(m\_.)\*((c\_.) + (d\_.)\*(x\_))^(n\_.), x\_Symbol] := Int  
 [ExpandIntegrand[(a + b\*x)^m\*(c + d\*x)^n, x], x] /; FreeQ[{a, b, c, d, n},  
 x] && NeQ[b\*c - a\*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && Le  
 Q[7\*m + 4\*n + 4, 0]) || LtQ[9\*m + 5\*(n + 1), 0] || GtQ[m + n + 2, 0])

Rubi steps

$$\begin{aligned} \int (13c + 13dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) dx &= \frac{169(c+dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{3d} - \frac{B \int \frac{2197(bc-ad)(c+dx)^2}{a+bx} dx}{39d} \\ &= \frac{169(c+dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{3d} - \frac{(169B(bc-ad)) \int \frac{(c+dx)^2}{a+bx} dx}{3d} \\ &= \frac{169(c+dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{3d} - \frac{(169B(bc-ad)) \int \left( \frac{d(bc-ad)}{b^2} + \frac{(bc-ad)}{b^2(a+bx)} \right) dx}{3d} \\ &= -\frac{169B(bc-ad)^2 x}{3b^2} - \frac{169B(bc-ad)(c+dx)^2}{6bd} - \frac{169B(bc-ad)^3 \log(a+bx)}{3b^3 d} \end{aligned}$$

**Mathematica [A]** time = 0.0398882, size = 97, normalized size = 0.82

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

Antiderivative was successfully verified.

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

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

**Maple [B]** time = 0.155, size = 1522, normalized size = 12.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

[Out]  $\frac{1}{3}e^{3d^2Ai^2}/(de/(dx+c)a-e/(dx+c)bc)^3a^3-1/3d^2B^2/b^3\ln(d*(b^2e/d+(ad-bc)^2e/d/(dx+c))-b^2e)^3a^3-B^2/b^3\ln(d*(b^2e/d+(ad-bc)^2e/d/(dx+c))-b^2e)^3a^3-1/3e/d^2B^2i^2/(de/(dx+c)a-e/(dx+c)bc)^3a^3+1/3e/d^2B^2i^2/(de/(dx+c)a-e/(dx+c)bc)^3a^3+1/6e^2d^2B^2i^2/b/(de/(dx+c)a-e/(dx+c)bc)^2a^3-1/6e^2/d^2B^2i^2*b^2/(de/(dx+c)a-e/(dx+c)bc)^2a^3+1/2e^2B^2i^2/(de/(dx+c)a-e/(dx+c)bc)^2a^3+e^3A^2i^2/(de/(dx+c)a-e/(dx+c)bc)^3a^3+2e^3B^2i^2*ln(b^2e/d+(ad-bc)^2e/d/(dx+c))*b^2/(de/(dx+c)a-e/(dx+c)bc)^3c^2a-1/3e^3d^2B^2i^2/b^2/(de/(dx+c)a-e/(dx+c)bc)^3a^3-1/3e^3/d^2A^2i^2/(de/(dx+c)a-e/(dx+c)bc)^3b^3c^3-1/2e^2d^2B^2i^2/(de/(dx+c)a-e/(dx+c)bc)^2a^2c+1/3e^3d^2B^2i^2*ln(b^2e/d+(ad-bc)^2e/d/(dx+c))/(de/(dx+c)a-e/(dx+c)bc)^3a^3+d^2B^2i^2/b^2*ln(d*(b^2e/d+(ad-bc)^2e/d/(dx+c))-b^2e)^2a^2c+e^3d^2B^2i^2/b/(de/(dx+c)a-e/(dx+c)bc)^3a^2bc-1/3e^3/d^2B^2i^2*ln(b^2e/d+(ad-bc)^2e/d/(dx+c))*b^3/(de/(dx+c)a-e/(dx+c)bc)^3c^3+1/3/d^2B^2i^2*ln(d*(b^2e/d+(ad-bc)^2e/d/(dx+c))-b^2e)^3a^5e^3d^3B^2i^2*ln(b^2e/d+(ad-bc)^2e/d/(dx+c))/b/(de/(dx+c)a-e/(dx+c)bc)^3a^4/(dx+c)^3c^2-20/3e^3d^2B^2i^2*ln(b^2e/d+(ad-bc)^2e/d/(dx+c))/(de/(dx+c)a-e/(dx+c)bc)^3a^3/(dx+c)^3c^3+1/3e^3/d^2B^2i^2*ln(b^2e/d+(ad-bc)^2e/d/(dx+c))*b^3/(de/(dx+c)a-e/(dx+c)bc)^3c^6/(dx+c)^3-e^3d^2B^2i^2*ln(b^2e/d+(ad-bc)^2e/d/(dx+c))/(de/(dx+c)a-e/(dx+c)bc)^3a^2bc+1/3e^3d^5B^2i^2*ln(b^2e/d+(ad-bc)^2e/d/(dx+c))/b^3/(de/(dx+c)a-e/(dx+c)bc)^3a^6/(dx+c)^3-2e^3B^2i^2*ln(b^2e/d+(ad-bc)^2e/d/(dx+c))*b^2/(de/(dx+c)a-e/(dx+c)bc)^3a^5/(dx+c)^3+5e^3d^2B^2i^2*ln(b^2e/d+(ad-bc)^2e/d/(dx+c))/(de/(dx+c)a-e/(dx+c)bc)^3a^2/(dx+c)^3c^4b-2e^3d^4B^2i^2*ln(b^2e/d+(ad-bc)^2e/d/(dx+c))/b^2/(de/(dx+c)a-e/(dx+c)bc)^3a^5/(dx+c)^3c$

**Maxima [B]** time = 1.38073, size = 378, normalized size = 3.2

$$\frac{1}{3}Ad^2i^2x^3 + Acdi^2x^2 + \left(x \log\left(\frac{bex}{dx+c} + \frac{ae}{dx+c}\right) + \frac{a \log(bx+a)}{b} - \frac{c \log(dx+c)}{d}\right)Bc^2i^2 + \left(x^2 \log\left(\frac{bex}{dx+c} + \frac{ae}{dx+c}\right) - \frac{a^2 \log(bx+a)}{b^2} + \frac{c^2 \log(dx+c)}{d^2} - (bc-a)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out]  $\frac{1}{3}A^2d^2i^2x^3 + A^2cd^2i^2x^2 + (x^2 \log(b^2ex/(dx+c)) + a^2e/(dx+c)) + a^2 \log(b^2x+a)/b - c^2 \log(dx+c)/d^2 B^2c^2i^2 + (x^2 \log(b^2ex/(dx+c)) + a^2e/(dx+c)) - a^2 \log(b^2x+a)/b^2 + c^2 \log(dx+c)/d^2 - (bc-a)$



$*d)*x/(b*d))*B*c*d*i^2 + 1/6*(2*x^3*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*\log(b*x + a)/b^3 - 2*c^3*\log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*d^2*i^2 + A*c^2*i^2*x$

**Fricas [B]** time = 1.35517, size = 467, normalized size = 3.96

$$\frac{2Ab^3d^3i^2x^3 - 2Bb^3c^3i^2\log(dx + c) + ((6A - B)b^3cd^2 + Bab^2d^3)i^2x^2 + 2((3A - 2B)b^3c^2d + 3Bab^2cd^2 - Ba^2bd^3)i^2x + 2A^2c^2i^2x}{6b^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

**Sympy [B]** time = 3.70134, size = 503, normalized size = 4.26

$$\frac{Ad^2i^2x^3}{3} + \frac{Bai^2(a^2d^2 - 3abcd + 3b^2c^2)\log\left(x + \frac{Ba^3cd^2i^2 - 3Ba^2bcd^2i^2 + \frac{Ba^2d^2(a^2d^2 - 3abcd + 3b^2c^2)}{b} + 4Bab^2c^3i^2 - Baci^2(a^2d^2 - 3abcd + 3b^2c^2)}{Ba^3d^3i^2 - 3Ba^2bcd^2i^2 + 3Bab^2c^2d^2i^2 + Bb^3c^3i^2}\right)}{3b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out]  $A*d**2*i**2*x**3/3 + B*a*i**2*(a**2*d**2 - 3*a*b*c*d + 3*b**2*c**2)*\log(x + (B*a**3*c*d**2*i**2 - 3*B*a**2*b*c**2*d*i**2 + B*a**2*d*i**2*(a**2*d**2 - 3*a*b*c*d + 3*b**2*c**2))/b + 4*B*a*b**2*c**3*i**2 - B*a*c*i**2*(a**2*d**2 - 3*a*b*c*d + 3*b**2*c**2))/(B*a**3*d**3*i**2 - 3*B*a**2*b*c*d**2*i**2 + 3*B*a*b**2*c**2*d*i**2 + B*b**3*c**3*i**2))/(3*b**3) - B*c**3*i**2*\log(x + (B*a**3*c*d**2*i**2 - 3*B*a**2*b*c**2*d*i**2 + 3*B*a*b**2*c**3*i**2 + B*b**3*c**4*i**2/d)/(B*a**3*d**3*i**2 - 3*B*a**2*b*c*d**2*i**2 + 3*B*a*b**2*c**2*d*i**2 + B*b**3*c**3*i**2))/(3*d) + (B*c**2*i**2*x + B*c*d*i**2*x**2 + B*d**2*i**2*x**3/3)*\log(e*(a + b*x)/(c + d*x)) + x**2*(6*A*b*c*d*i**2 + B*a*d**2*$

$$i^{**2} - B*b*c*d*i^{**2})/(6*b) - x*(-3*A*b^{**2}*c^{**2}*i^{**2} + B*a^{**2}*d^{**2}*i^{**2} - 3*B*a*b*c*d*i^{**2} + 2*B*b^{**2}*c^{**2}*i^{**2})/(3*b^{**2})$$

**Giac [A]** time = 2.04041, size = 240, normalized size = 2.03

$$-\frac{1}{3}(Ad^2 + Bd^2)x^3 + \frac{Bc^3 \log(dx + c)}{3d} - \frac{(6Abcd + 5Bbcd + Bad^2)x^2}{6b} - \frac{1}{3}(Bd^2x^3 + 3Bcdx^2 + 3Bc^2x) \log\left(\frac{bx + a}{dx + c}\right) - \frac{(3$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

$$3.14 \quad \int \frac{(ci+dx)^2 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{ag+bgx} dx$$

**Optimal.** Leaf size=276

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

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

**Rubi [A]** time = 0.490415, antiderivative size = 354, normalized size of antiderivative = 1.28, number of steps used = 19, number of rules used = 13, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.325$ , Rules used = {2528, 2486, 31, 2524, 12, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 43}

$$\frac{Bi^2(bc-ad)^2 \text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{b^3g} + \frac{i^2(bc-ad)^2 \log(ag+bgx) \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{b^3g} + \frac{Adi^2x(bc-ad)}{b^2g} + \frac{i^2(c+dx)^2}{b^3g}$$

Antiderivative was successfully verified.

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

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

**Rule 2528**

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*(RGx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u

```
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2486

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

### Rule 31

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

### Rule 2524

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

### Rule 12

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

### Rule 2418

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

### Rule 2390

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

### Rule 2301

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

### Rule 2394

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

### Rule 2393

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

### Rule 2391

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

### Rule 2525

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

### Rule 43

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

### Rubi steps

$$\begin{aligned}
\int \frac{(14c + 14dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{ag + bgx} dx &= \int \left( \frac{196d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2g} + \frac{14d(14c + 14dx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{bg} \right) dx \\
&= \frac{(196(bc - ad)^2) \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{ag+bgx} dx}{b^2} + \frac{(14d) \int (14c + 14dx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) dx}{bg} \\
&= \frac{196Ad(bc - ad)x}{b^2g} + \frac{98(c + dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{bg} + \frac{196(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{bg} \\
&= \frac{196Ad(bc - ad)x}{b^2g} + \frac{196Bd(bc - ad)(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^3g} + \frac{98(c + dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{bg} \\
&= \frac{196Ad(bc - ad)x}{b^2g} + \frac{196Bd(bc - ad)(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^3g} + \frac{98(c + dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{bg} \\
&= \frac{196Ad(bc - ad)x}{b^2g} - \frac{98Bd(bc - ad)x}{b^2g} - \frac{98B(bc - ad)^2 \log(a + bx)}{b^3g} + \frac{196Bd(bc - ad)(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^3g} \\
&= \frac{196Ad(bc - ad)x}{b^2g} - \frac{98Bd(bc - ad)x}{b^2g} - \frac{98B(bc - ad)^2 \log(a + bx)}{b^3g} + \frac{196Bd(bc - ad)(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^3g} \\
&= \frac{196Ad(bc - ad)x}{b^2g} - \frac{98Bd(bc - ad)x}{b^2g} - \frac{98B(bc - ad)^2 \log(a + bx)}{b^3g} + \frac{196Bd(bc - ad)(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^3g} \\
&= \frac{196Ad(bc - ad)x}{b^2g} - \frac{98Bd(bc - ad)x}{b^2g} - \frac{98B(bc - ad)^2 \log(a + bx)}{b^3g} - \frac{98B(bc - ad)(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^3g}
\end{aligned}$$

**Mathematica [A]** time = 0.182786, size = 252, normalized size = 0.91

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

Antiderivative was successfully verified.

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

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

**Maple [B]** time = 0.176, size = 2538, normalized size = 9.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

$$\begin{aligned} & a^2/(d*x+c)*c-3*e*d*B*i^2/g/b*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)* \\ & a-e/(d*x+c)*b*c)*c^2/(d*x+c)*a+2*e^2*d^3*B*i^2/g/b^2*\ln(b*e/d+(a*d-b*c)*e/d \\ & / (d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3/(d*x+c)^2*c-3*e^2*d^2*B*i^2/g \\ & /b*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2/(d*x \\ & +c)^2*c^2-1/2*e^2*d^4*B*i^2/g/b^3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x \\ & +c)*a-e/(d*x+c)*b*c)^2*a^4/(d*x+c)^2-e*d*B*i^2/g/b/(d*e/(d*x+c)*a-e/(d*x+c) \\ & *b*c)*c*a+2*e*d*A*i^2/g/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a*c+2*d*B*i^2/g/b^2 \\ & *\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*\ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/ \\ & b/e)*a*c-e*d^2*B*i^2/g/b^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e \\ & / (d*x+c)*b*c)*a^2-1/2*e^2*B*i^2/g*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x \\ & +c)*a-e/(d*x+c)*b*c)^2*c^4/(d*x+c)^2*b+1/2*e^2*d^2*B*i^2/g/b*\ln(b*e/d+(a*d- \\ & b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2-e^2*d*B*i^2/g*\ln(b*e/ \\ & d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c*a \end{aligned}$$

**Maxima [A]** time = 1.61365, size = 699, normalized size = 2.53

$$2 A c d i^2 \left( \frac{x}{b g} - \frac{a \log(b x + a)}{b^2 g} \right) + \frac{1}{2} A d^2 i^2 \left( \frac{2 a^2 \log(b x + a)}{b^3 g} + \frac{b x^2 - 2 a x}{b^2 g} \right) + \frac{A c^2 i^2 \log(b g x + a g)}{b g} - \frac{(3 b c^2 i^2 - 2 a c d i^2) B \log(b x + a)}{2 b^2 g}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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



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

$$\text{integral} \left( \frac{Ad^2i^2x^2 + 2Ac di^2x + Ac^2i^2 + (Bd^2i^2x^2 + 2Bcdi^2x + Bc^2i^2) \log\left(\frac{bex+ae}{dx+c}\right)}{bgx + ag}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] Timed out

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

$$3.15 \quad \int \frac{(ci+dx)^2 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{(ag+bgx)^2} dx$$

**Optimal.** Leaf size=247

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

[Out]  $-\left(\frac{B(b*c - a*d)*i^2*(c + d*x)}{b^2*g^2*(a + b*x)}\right) + \frac{d^2*i^2*(a + b*x)*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])}{b^3*g^2} - \left(\frac{(b*c - a*d)*i^2*(c + d*x)*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])}{b^2*g^2*(a + b*x)}\right) - \frac{B*d*(b*c - a*d)*i^2*\text{Log}[c + d*x]}{b^3*g^2} - \frac{2*d*(b*c - a*d)*i^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])*\text{Log}[1 - (b*(c + d*x))/(d*(a + b*x))]}{b^3*g^2} + \frac{2*B*d*(b*c - a*d)*i^2*\text{PolyLog}[2, (b*(c + d*x))/(d*(a + b*x))]}{b^3*g^2}$

**Rubi [A]** time = 0.517991, antiderivative size = 313, normalized size of antiderivative = 1.27, number of steps used = 18, number of rules used = 13, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.325$ , Rules used = {2528, 2486, 31, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{2Bdi^2(bc-ad)\text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{b^3g^2} + \frac{2di^2(bc-ad)\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{b^3g^2} - \frac{i^2(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{b^3g^2(a+bx)}$$

Antiderivative was successfully verified.

[In]  $\text{Int}\left[\frac{(c*i + d*i*x)^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])}{(a*g + b*g*x)^2}, x\right]$

[Out]  $\frac{A*d^2*i^2*x}{b^2*g^2} - \frac{B*(b*c - a*d)^2*i^2}{b^3*g^2*(a + b*x)} - \frac{B*d*(b*c - a*d)*i^2*\text{Log}[a + b*x]}{b^3*g^2} - \frac{B*d*(b*c - a*d)*i^2*\text{Log}[a + b*x]^2}{b^3*g^2} + \frac{B*d^2*i^2*(a + b*x)*\text{Log}[(e*(a + b*x))/(c + d*x)]}{b^3*g^2} - \left(\frac{(b*c - a*d)^2*i^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])}{b^3*g^2*(a + b*x)}\right) + \frac{2*d*(b*c - a*d)*i^2*\text{Log}[a + b*x]*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])}{b^3*g^2} + \frac{2*B*d*(b*c - a*d)*i^2*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)]}{b^3*g^2} + \frac{2*B*d*(b*c - a*d)*i^2*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]}{b^3*g^2}$

**Rule 2528**

$\text{Int}[(a_. + \text{Log}[c_.]*(\text{RFx}_.)^{(p_.)}]*(b_.))^{(n_.)}*(\text{RGx}_.), x\_Symbol] := \text{With}[\{u = \text{ExpandIntegrand}[(a + b*\text{Log}[c*\text{RFx}^p])^n, \text{RGx}, x]\}, \text{Int}[u, x] /; \text{SumQ}[u$

```
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2486

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

### Rule 31

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

### Rule 2525

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

### Rule 12

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

### Rule 44

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

### Rule 2524

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

Rule 2418

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

Rule 2390

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

Rule 2301

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

Rule 2394

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

Rule 2393

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

Rule 2391

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

Rubi steps

$$\begin{aligned}
\int \frac{(15c + 15dx)^2 \left( A + B \log\left(\frac{e^{(a+bx)}}{c+dx}\right) \right)}{(ag + bgx)^2} dx &= \int \left( \frac{225d^2 \left( A + B \log\left(\frac{e^{(a+bx)}}{c+dx}\right) \right)}{b^2g^2} + \frac{225(bc - ad)^2 \left( A + B \log\left(\frac{e^{(a+bx)}}{c+dx}\right) \right)}{b^2g^2(a + bx)^2} + \frac{450d(bc - ad) \log(a + bx)}{b^3g^2} \right) dx \\
&= \frac{(225d^2) \int \left( A + B \log\left(\frac{e^{(a+bx)}}{c+dx}\right) \right) dx}{b^2g^2} + \frac{(450d(bc - ad)) \int \frac{A + B \log\left(\frac{e^{(a+bx)}}{c+dx}\right)}{a+bx} dx}{b^2g^2} \\
&= \frac{225Ad^2x}{b^2g^2} - \frac{225(bc - ad)^2 \left( A + B \log\left(\frac{e^{(a+bx)}}{c+dx}\right) \right)}{b^3g^2(a + bx)} + \frac{450d(bc - ad) \log(a + bx)}{b^3g^2} \\
&= \frac{225Ad^2x}{b^2g^2} + \frac{225Bd^2(a + bx) \log\left(\frac{e^{(a+bx)}}{c+dx}\right)}{b^3g^2} - \frac{225(bc - ad)^2 \left( A + B \log\left(\frac{e^{(a+bx)}}{c+dx}\right) \right)}{b^3g^2(a + bx)} \\
&= \frac{225Ad^2x}{b^2g^2} + \frac{225Bd^2(a + bx) \log\left(\frac{e^{(a+bx)}}{c+dx}\right)}{b^3g^2} - \frac{225(bc - ad)^2 \left( A + B \log\left(\frac{e^{(a+bx)}}{c+dx}\right) \right)}{b^3g^2(a + bx)} \\
&= \frac{225Ad^2x}{b^2g^2} - \frac{225B(bc - ad)^2}{b^3g^2(a + bx)} - \frac{225Bd(bc - ad) \log(a + bx)}{b^3g^2} + \frac{225Bd^2(a + bx)}{b^3g^2} \\
&= \frac{225Ad^2x}{b^2g^2} - \frac{225B(bc - ad)^2}{b^3g^2(a + bx)} - \frac{225Bd(bc - ad) \log(a + bx)}{b^3g^2} + \frac{225Bd^2(a + bx)}{b^3g^2} \\
&= \frac{225Ad^2x}{b^2g^2} - \frac{225B(bc - ad)^2}{b^3g^2(a + bx)} - \frac{225Bd(bc - ad) \log(a + bx)}{b^3g^2} - \frac{225Bd(bc - ad)}{b^3g^2} \\
&= \frac{225Ad^2x}{b^2g^2} - \frac{225B(bc - ad)^2}{b^3g^2(a + bx)} - \frac{225Bd(bc - ad) \log(a + bx)}{b^3g^2} - \frac{225Bd(bc - ad)}{b^3g^2}
\end{aligned}$$

**Mathematica [A]** time = 0.231755, size = 221, normalized size = 0.89

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

Antiderivative was successfully verified.

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

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

**Maple [B]** time = 0.161, size = 1465, normalized size = 5.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

**Maxima [B]** time = 1.76139, size = 1339, normalized size = 5.42

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral} \left( \frac{Ad^2i^2x^2 + 2Acdi^2x + Ac^2i^2 + (Bd^2i^2x^2 + 2Bcdi^2x + Bc^2i^2) \log\left(\frac{bex+ae}{dx+c}\right)}{b^2g^2x^2 + 2abg^2x + a^2g^2}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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



$$3.16 \quad \int \frac{(ci+dx)^2 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{(ag+bgx)^3} dx$$

**Optimal.** Leaf size=230

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

[Out]  $-\left(\frac{B*d*i^2*(c+d*x)}{b^2*g^3*(a+b*x)}\right) - \frac{(B*i^2*(c+d*x)^2)/(4*b*g^3*(a+b*x)^2) - (d*i^2*(c+d*x)*(A+B*Log[(e*(a+b*x))/(c+d*x]))]/(b^2*g^3*(a+b*x)) - (i^2*(c+d*x)^2*(A+B*Log[(e*(a+b*x))/(c+d*x]))]/(2*b*g^3*(a+b*x)^2) - (d^2*i^2*(A+B*Log[(e*(a+b*x))/(c+d*x]))*Log[1 - (b*(c+d*x)/(d*(a+b*x)))]/(b^3*g^3) + (B*d^2*i^2*PolyLog[2, (b*(c+d*x))/(d*(a+b*x))])/(b^3*g^3)}$

**Rubi [A]** time = 0.589218, antiderivative size = 338, normalized size of antiderivative = 1.47, number of steps used = 19, number of rules used = 11, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.275$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

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

Antiderivative was successfully verified.

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

[Out]  $-\frac{B*(b*c - a*d)^2*i^2}{4*b^3*g^3*(a+b*x)^2} - \frac{(3*B*d*(b*c - a*d)*i^2)/(2*b^3*g^3*(a+b*x)) - (3*B*d^2*i^2*Log[a+b*x])/(2*b^3*g^3) - (B*d^2*i^2*Log[a+b*x]^2)/(2*b^3*g^3) - ((b*c - a*d)^2*i^2*(A + B*Log[(e*(a+b*x))/(c+d*x]))]/(2*b^3*g^3*(a+b*x)^2) - (2*d*(b*c - a*d)*i^2*(A + B*Log[(e*(a+b*x))/(c+d*x]))]/(b^3*g^3*(a+b*x)) + (d^2*i^2*Log[a+b*x]*(A + B*Log[(e*(a+b*x))/(c+d*x]))]/(b^3*g^3) + (3*B*d^2*i^2*Log[c+d*x])/(2*b^3*g^3) + (B*d^2*i^2*Log[a+b*x]*Log[(b*(c+d*x))/(b*c - a*d)]/(b^3*g^3) + (B*d^2*i^2*PolyLog[2, -((d*(a+b*x))/(b*c - a*d))])/(b^3*g^3)}$

**Rule 2528**

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*(RGx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u

```
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

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

### Rule 12

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

### Rule 44

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

### Rule 2524

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

### Rule 2418

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

### Rule 2390

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

Rule 2301

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

Rule 2394

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

Rule 2393

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

Rule 2391

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

Rubi steps

$$\begin{aligned}
\int \frac{(16c + 16dx)^2 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{(ag + bgx)^3} dx &= \int \left( \frac{256(bc - ad)^2 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{b^2 g^3 (a + bx)^3} + \frac{512d(bc - ad) \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{b^2 g^3 (a + bx)^2} \right) dx \\
&= \frac{(256d^2) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx} dx}{b^2 g^3} + \frac{(512d(bc - ad)) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2} dx}{b^2 g^3} + \frac{(256(bc - ad)^2) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^3} dx}{b^2 g^3} \\
&= -\frac{128(bc - ad)^2 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{b^3 g^3 (a + bx)^2} - \frac{512d(bc - ad) \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{b^3 g^3 (a + bx)} + \frac{128(bc - ad)^2 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{b^3 g^3 (a + bx)^2} \\
&= -\frac{128(bc - ad)^2 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{b^3 g^3 (a + bx)^2} - \frac{512d(bc - ad) \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{b^3 g^3 (a + bx)} + \frac{128(bc - ad)^2 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{b^3 g^3 (a + bx)^2} \\
&= -\frac{128(bc - ad)^2 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{b^3 g^3 (a + bx)^2} - \frac{512d(bc - ad) \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{b^3 g^3 (a + bx)} + \frac{128(bc - ad)^2 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{b^3 g^3 (a + bx)^2} \\
&= -\frac{64B(bc - ad)^2}{b^3 g^3 (a + bx)^2} - \frac{384Bd(bc - ad)}{b^3 g^3 (a + bx)} - \frac{384Bd^2 \log(a + bx)}{b^3 g^3} - \frac{128(bc - ad)^2 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{b^3 g^3 (a + bx)^2} \\
&= -\frac{64B(bc - ad)^2}{b^3 g^3 (a + bx)^2} - \frac{384Bd(bc - ad)}{b^3 g^3 (a + bx)} - \frac{384Bd^2 \log(a + bx)}{b^3 g^3} - \frac{128(bc - ad)^2 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{b^3 g^3 (a + bx)^2} \\
&= -\frac{64B(bc - ad)^2}{b^3 g^3 (a + bx)^2} - \frac{384Bd(bc - ad)}{b^3 g^3 (a + bx)} - \frac{384Bd^2 \log(a + bx)}{b^3 g^3} - \frac{128Bd^2 \log^2(a + bx)}{b^3 g^3} \\
&= -\frac{64B(bc - ad)^2}{b^3 g^3 (a + bx)^2} - \frac{384Bd(bc - ad)}{b^3 g^3 (a + bx)} - \frac{384Bd^2 \log(a + bx)}{b^3 g^3} - \frac{128Bd^2 \log^2(a + bx)}{b^3 g^3}
\end{aligned}$$

**Mathematica [A]** time = 0.332654, size = 244, normalized size = 1.06

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

Antiderivative was successfully verified.

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

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

**Maple [B]** time = 0.07, size = 1495, normalized size = 6.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral} \left( \frac{Ad^2i^2x^2 + 2Ac di^2x + Ac^2i^2 + (Bd^2i^2x^2 + 2Bcdi^2x + Bc^2i^2) \log\left(\frac{bex+ae}{dx+c}\right)}{b^3g^3x^3 + 3ab^2g^3x^2 + 3a^2bg^3x + a^3g^3}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

$$3.17 \quad \int \frac{(ci+dx)^2 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{(ag+bgx)^4} dx$$

**Optimal.** Leaf size=89

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

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

**Rubi [B]** time = 0.489984, antiderivative size = 287, normalized size of antiderivative = 3.22, number of steps used = 14, number of rules used = 4, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.1$ , Rules used = {2528, 2525, 12, 44}

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

Antiderivative was successfully verified.

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

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

### Rule 2528

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

### Rule 2525



```

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

```

### Rule 12

```

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

```

### Rule 44

```

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

```

### Rubi steps

$$\begin{aligned}
\int \frac{(17c + 17dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{(ag + bgx)^4} dx &= \int \left( \frac{289(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2 g^4 (a + bx)^4} + \frac{578d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2 g^4 (a + bx)^3} \right) dx \\
&= \frac{(289d^2) \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{(a+bx)^2} dx}{b^2 g^4} + \frac{(578d(bc - ad)) \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{(a+bx)^3} dx}{b^2 g^4} + \frac{(289(bc - ad)^2) \int \frac{1}{(a+bx)^4} dx}{b^2 g^4} \\
&= \frac{289(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{3b^3 g^4 (a + bx)^3} - \frac{289d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^4 (a + bx)^2} \\
&= \frac{289(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{3b^3 g^4 (a + bx)^3} - \frac{289d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^4 (a + bx)^2} \\
&= \frac{289(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{3b^3 g^4 (a + bx)^3} - \frac{289d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^4 (a + bx)^2} \\
&= \frac{289B(bc - ad)^2}{9b^3 g^4 (a + bx)^3} - \frac{289Bd(bc - ad)}{3b^3 g^4 (a + bx)^2} - \frac{289Bd^2}{3b^3 g^4 (a + bx)} - \frac{289Bd^3 \log(a + bx)}{3b^3 (bc - ad) g^4}
\end{aligned}$$

**Mathematica [B]** time = 0.318232, size = 315, normalized size = 3.54

$$i^2 \left( -9a^2 Abd^3 x - 3a^3 Ad^3 + 3B(bc - ad) (a^2 d^2 + abd(c + 3dx) + b^2 (c^2 + 3cdx + 3d^2 x^2)) \log\left(\frac{e(a+bx)}{c+dx}\right) - 9a^2 b B d^3 x \log(c + dx) \right)$$

Antiderivative was successfully verified.

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

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

**Maple [B]** time = 0.055, size = 406, normalized size = 4.6

$$\frac{de^3i^2Aa}{3(ad-bc)^2g^4} \left( \frac{be}{d} + \frac{ae}{dx+c} - \frac{bec}{(dx+c)d} \right)^{-3} - \frac{e^3i^2Abc}{3(ad-bc)^2g^4} \left( \frac{be}{d} + \frac{ae}{dx+c} - \frac{bec}{(dx+c)d} \right)^{-3} + \frac{de^3i^2Ba}{3(ad-bc)^2g^4} \ln\left(\frac{be}{d} + \frac{ae}{dx+c} - \frac{bec}{(dx+c)d}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] 
$$\frac{1}{3}e^3d^2i^2/(a*d-b*c)^2/g^4A/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3a-1/3 * e^3i^2/(a*d-b*c)^2/g^4A/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3b*c+1/3e^3d^2i^2/(a*d-b*c)^2/g^4B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*\text{ln}(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-1/3e^3i^2/(a*d-b*c)^2/g^4B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*\text{ln}(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+1/9e^3d^2i^2/(a*d-b*c)^2/g^4B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3a-1/9e^3i^2/(a*d-b*c)^2/g^4B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3b*c$$

**Maxima [B]** time = 1.58937, size = 2045, normalized size = 22.98

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4,x, algorithm="maxima")
```

```
[Out] -1/18*B*d^2*i^2*(6*(3*b^2*x^2 + 3*a*b*x + a^2)*log(b*e*x/(d*x + c) + a*e/(d*x + c)))/(b^6*g^4*x^3 + 3*a*b^5*g^4*x^2 + 3*a^2*b^4*g^4*x + a^3*b^3*g^4) +
(11*a^2*b^2*c^2 - 7*a^3*b*c*d + 2*a^4*d^2 + 6*(3*b^4*c^2 - 3*a*b^3*c*d + a^2*b^2*d^2)*x^2 + 3*(9*a*b^3*c^2 - 7*a^2*b^2*c*d + 2*a^3*b*d^2)*x)/((b^8*c^2 - 2*a*b^7*c*d + a^2*b^6*d^2)*g^4*x^3 + 3*(a*b^7*c^2 - 2*a^2*b^6*c*d + a^3*b^5*d^2)*g^4*x^2 + 3*(a^2*b^6*c^2 - 2*a^3*b^5*c*d + a^4*b^4*d^2)*g^4*x + (a^3*b^5*c^2 - 2*a^4*b^4*c*d + a^5*b^3*d^2)*g^4) + 6*(3*b^2*c^2*d - 3*a*b*c*d^2 + a^2*d^3)*log(b*x + a)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^4) - 6*(3*b^2*c^2*d - 3*a*b*c*d^2 + a^2*d^3)*log(d*x + c)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^4)) - 1/18*B*c*d*i^2*(6*(3*b*x + a)*log(b*e*x/(d*x + c) + a*e/(d*x + c)))/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) + (5*a*b^2*c^2 - 22*a^2*b*c*d + 5*a^3*d^2 - 6*(3*b^3*c*d - a*b^2*d^2)*x^2 + 3*(3*b^3*c^2 - 16*a*b^2*c*d + 5*a^2*b*d^2)*x)/((b^7*c^2 - 2*a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3*(a*b^6*c^2 - 2*a^2*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*c*d + a^4*b^3*d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4) - 6*(3*b*c*d^2 - a*d^3)*log(b*x + a)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4) + 6*(3*b*c*d^2 - a*d^3)*log(d*x + c)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4)) - 1/18*B*c^2*i^2*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4) + 6*log(b*e*x/(d*x + c) + a*e/(d*x + c)))/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4)) - 1/3*(3*b*x + a)*A*c*d*i^2/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) - 1/3*(3*b^2*x^2 + 3*a*b*x + a^2)*A*d^2*i^2/(b^6*g^4*x^3 + 3*a*b^5*g^4*x^2 + 3*a^2*b^4*g^4*x + a^3*b^3*g^4) - 1/3*A*c^2*i^2/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4)
```

**Fricas [B]** time = 0.780945, size = 544, normalized size = 6.11

$$\frac{3 \left( (3A + B)b^3cd^2 - (3A + B)ab^2d^3 \right) i^2 x^2 + 3 \left( (3A + B)b^3c^2d - (3A + B)a^2bd^3 \right) i^2 x + \left( (3A + B)b^3c^3 - (3A + B)a^3d^3 \right)}{9 \left( (b^7c - ab^6d)g^4x^3 + 3(ab^6c - a^2b^5d)g^4x^2 + 3(a^2b^5c - a^3b^4d)g^4x + \dots \right)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)^4,x, algorithm="fricas")

[Out]  $-1/9*(3*((3*A + B)*b^3*c*d^2 - (3*A + B)*a*b^2*d^3)*i^2*x^2 + 3*((3*A + B)*b^3*c^2*d - (3*A + B)*a^2*b*d^3)*i^2*x + ((3*A + B)*b^3*c^3 - (3*A + B)*a^3*d^3)*i^2 + 3*(B*b^3*d^3*i^2*x^3 + 3*B*b^3*c*d^2*i^2*x^2 + 3*B*b^3*c^2*d*i^2*x + B*b^3*c^3*i^2)*\log((b*e*x + a*e)/(d*x + c)))/((b^7*c - a*b^6*d)*g^4*x^3 + 3*(a*b^6*c - a^2*b^5*d)*g^4*x^2 + 3*(a^2*b^5*c - a^3*b^4*d)*g^4*x + (a^3*b^4*c - a^4*b^3*d)*g^4)$

**Sympy [B]** time = 26.5454, size = 610, normalized size = 6.85

$$\frac{Bd^3i^2 \log\left(x + \frac{-\frac{Ba^2d^5i^2}{ad-bc} + \frac{2Babcd^4i^2}{ad-bc} + Bad^4i^2 - \frac{Bb^2c^2d^3i^2}{ad-bc} + Bbcd^3i^2}{2Bbd^4i^2}\right)}{3b^3g^4(ad-bc)} + \frac{Bd^3i^2 \log\left(x + \frac{\frac{Ba^2d^5i^2}{ad-bc} - \frac{2Babcd^4i^2}{ad-bc} + Bad^4i^2 + \frac{Bb^2c^2d^3i^2}{ad-bc} + Bbcd^3i^2}{2Bbd^4i^2}\right)}{3b^3g^4(ad-bc)} - \frac{3Aa^2d^2}{3b^3g^4(ad-bc)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*\*2\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)\*\*4,x)

[Out]  $-B*d**3*i**2*\log(x + (-B*a**2*d**5*i**2/(a*d - b*c) + 2*B*a*b*c*d**4*i**2/(a*d - b*c) + B*a*d**4*i**2 - B*b**2*c**2*d**3*i**2/(a*d - b*c) + B*b*c*d**3*i**2)/(2*B*b*d**4*i**2))/(3*b**3*g**4*(a*d - b*c)) + B*d**3*i**2*\log(x + (B*a**2*d**5*i**2/(a*d - b*c) - 2*B*a*b*c*d**4*i**2/(a*d - b*c) + B*a*d**4*i**2 + B*b**2*c**2*d**3*i**2/(a*d - b*c) + B*b*c*d**3*i**2)/(2*B*b*d**4*i**2))/(3*b**3*g**4*(a*d - b*c)) - (3*A*a**2*d**2*i**2 + 3*A*a*b*c*d*i**2 + 3*A*b**2*c**2*i**2 + B*a**2*d**2*i**2 + B*a*b*c*d*i**2 + B*b**2*c**2*i**2 + x**2*(9*A*b**2*d**2*i**2 + 3*B*b**2*d**2*i**2) + x*(9*A*a*b*d**2*i**2 + 9*A*b**2*c*d*i**2 + 3*B*a*b*d**2*i**2 + 3*B*b**2*c*d*i**2))/(9*a**3*b**3*g**4 + 27*a**2*b**4*g**4*x + 27*a*b**5*g**4*x**2 + 9*b**6*g**4*x**3) + (-B*a**2*d**2*i**2 - B*a*b*c*d*i**2 - 3*B*a*b*d**2*i**2*x - B*b**2*c**2*i**2 - 3*B*b**2*c*d*i**2*x - 3*B*b**2*d**2*i**2*x**2)*\log(e*(a + b*x)/(c + d*x))/(3*a**3*b**3*g**4 + 9*a**2*b**4*g**4*x + 9*a*b**5*g**4*x**2 + 3*b**6*g**4*x**3)$

**Giac [B]** time = 1.31054, size = 463, normalized size = 5.2

$$\frac{Bd^3 \log(bx + a)}{3(b^4cg^4 - ab^3dg^4)} - \frac{Bd^3 \log(dx + c)}{3(b^4cg^4 - ab^3dg^4)} + \frac{(3Bb^2d^2x^2 + 3Bb^2cdx + 3Babd^2x + Bb^2c^2 + Babcd + Ba^2d^2) \log\left(\frac{bx+a}{dx+c}\right)}{3(b^6g^4x^3 + 3ab^5g^4x^2 + 3a^2b^4g^4x + a^3b^3g^4)} + \frac{9}{3(b^6g^4x^3 + 3ab^5g^4x^2 + 3a^2b^4g^4x + a^3b^3g^4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4,x, algorithm="giac")
```

```
[Out] 1/3*B*d^3*log(b*x + a)/(b^4*c*g^4 - a*b^3*d*g^4) - 1/3*B*d^3*log(d*x + c)/(b^4*c*g^4 - a*b^3*d*g^4) + 1/3*(3*B*b^2*d^2*x^2 + 3*B*b^2*c*d*x + 3*B*a*b*d^2*x + B*b^2*c^2 + B*a*b*c*d + B*a^2*d^2)*log((b*x + a)/(d*x + c))/(b^6*g^4*x^3 + 3*a*b^5*g^4*x^2 + 3*a^2*b^4*g^4*x + a^3*b^3*g^4) + 1/9*(9*A*b^2*d^2*x^2 + 12*B*b^2*d^2*x^2 + 9*A*b^2*c*d*x + 12*B*b^2*c*d*x + 9*A*a*b*d^2*x + 12*B*a*b*d^2*x + 3*A*b^2*c^2 + 4*B*b^2*c^2 + 3*A*a*b*c*d + 4*B*a*b*c*d + 3*A*a^2*d^2 + 4*B*a^2*d^2)/(b^6*g^4*x^3 + 3*a*b^5*g^4*x^2 + 3*a^2*b^4*g^4*x + a^3*b^3*g^4)
```

$$3.18 \quad \int \frac{(ci+dx)^2 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{(ag+bgx)^5} dx$$

**Optimal.** Leaf size=181

$$-\frac{bi^2(c+dx)^4 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{4g^5(a+bx)^4(bc-ad)^2} + \frac{di^2(c+dx)^3 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{3g^5(a+bx)^3(bc-ad)^2} - \frac{bBi^2(c+dx)^4}{16g^5(a+bx)^4(bc-ad)^2} + \frac{Bdi^2(c+dx)^3}{9g^5(a+bx)^3(bc-ad)^2}$$

[Out]  $(B*d*i^2*(c+d*x)^3)/(9*(b*c-a*d)^2*g^5*(a+b*x)^3) - (b*B*i^2*(c+d*x)^4)/(16*(b*c-a*d)^2*g^5*(a+b*x)^4) + (d*i^2*(c+d*x)^3*(A+B*Log[(e*(a+b*x))/(c+d*x)]))/(3*(b*c-a*d)^2*g^5*(a+b*x)^3) - (b*i^2*(c+d*x)^4*(A+B*Log[(e*(a+b*x))/(c+d*x)]))/(4*(b*c-a*d)^2*g^5*(a+b*x)^4)$

**Rubi [A]** time = 0.571379, antiderivative size = 325, normalized size of antiderivative = 1.8, number of steps used = 14, number of rules used = 4, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.1$ , Rules used = {2528, 2525, 12, 44}

$$-\frac{d^2i^2 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{2b^3g^5(a+bx)^2} - \frac{2di^2(bc-ad) \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{3b^3g^5(a+bx)^3} - \frac{i^2(bc-ad)^2 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{4b^3g^5(a+bx)^4} + \frac{Bd^3i^2}{12b^3g^5(a+bx)(b-c)}$$

Antiderivative was successfully verified.

[In] Int[((c\*i + d\*i\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(a\*g + b\*g\*x)^5, x]

[Out]  $-(B*(b*c-a*d)^2*i^2)/(16*b^3*g^5*(a+b*x)^4) - (5*B*d*(b*c-a*d)*i^2)/(36*b^3*g^5*(a+b*x)^3) - (B*d^2*i^2)/(24*b^3*g^5*(a+b*x)^2) + (B*d^3*i^2)/(12*b^3*(b*c-a*d)*g^5*(a+b*x)) + (B*d^4*i^2*Log[a+b*x])/(12*b^3*(b*c-a*d)^2*g^5) - ((b*c-a*d)^2*i^2*(A+B*Log[(e*(a+b*x))/(c+d*x)]))/(4*b^3*g^5*(a+b*x)^4) - (2*d*(b*c-a*d)*i^2*(A+B*Log[(e*(a+b*x))/(c+d*x)]))/(3*b^3*g^5*(a+b*x)^3) - (d^2*i^2*(A+B*Log[(e*(a+b*x))/(c+d*x)]))/(2*b^3*g^5*(a+b*x)^2) - (B*d^4*i^2*Log[c+d*x])/(12*b^3*(b*c-a*d)^2*g^5)$

**Rule 2528**

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*(RGx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x]

onQ[RGx, x] && IGtQ[n, 0]

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

### Rubi steps

$$\begin{aligned}
\int \frac{(18c + 18dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{(ag + bgx)^5} dx &= \int \left( \frac{324(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2 g^5 (a + bx)^5} + \frac{648d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2 g^5 (a + bx)^4} \right) dx \\
&= \frac{(324d^2) \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{(a+bx)^3} dx}{b^2 g^5} + \frac{(648d(bc - ad)) \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{(a+bx)^4} dx}{b^2 g^5} + \frac{(324(bc - ad)^2) \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{(a+bx)^5} dx}{b^2 g^5} \\
&= -\frac{81(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^5 (a + bx)^4} - \frac{216d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^5 (a + bx)^3} - \frac{81(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^5 (a + bx)^4} \\
&= -\frac{81(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^5 (a + bx)^4} - \frac{216d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^5 (a + bx)^3} \\
&= -\frac{81(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^5 (a + bx)^4} - \frac{216d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^5 (a + bx)^3} \\
&= -\frac{81B(bc - ad)^2}{4b^3 g^5 (a + bx)^4} - \frac{45Bd(bc - ad)}{b^3 g^5 (a + bx)^3} - \frac{27Bd^2}{2b^3 g^5 (a + bx)^2} + \frac{27Bd^3}{b^3 (bc - ad) g^5 (a + bx)}
\end{aligned}$$

**Mathematica [B]** time = 0.38713, size = 454, normalized size = 2.51

$$i^2 \left( 72a^2 Ab^2 d^4 x^2 + 48a^3 Abd^4 x + 12a^4 Ad^4 + 12B(bc - ad)^2 (a^2 d^2 + 2abd(c + 2dx) + b^2 (3c^2 + 8cdx + 6d^2 x^2)) \log \left( \frac{e(a+bx)}{c+dx} \right) \right)$$

Antiderivative was successfully verified.

[In] Integrate[((c + d\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])))/(a\*g + b\*g\*x)^5, x]

[Out] 
$$\begin{aligned}
&-(i^2*(36*A*b^4*c^4 + 9*b^4*B*c^4 - 48*a*A*b^3*c^3*d - 16*a*b^3*B*c^3*d + 12*a^4*A*d^4 + 7*a^4*B*d^4 + 96*A*b^4*c^3*d*x + 20*b^4*B*c^3*d*x - 144*a*A*b^3*c^2*d^2*x - 48*a*b^3*B*c^2*d^2*x + 48*a^3*A*b*d^4*x + 28*a^3*b*B*d^4*x + 72*A*b^4*c^2*d^2*x^2 + 6*b^4*B*c^2*d^2*x^2 - 144*a*A*b^3*c*d^3*x^2 - 48*a*b^3*B*c*d^3*x^2 + 72*a^2*A*b^2*d^4*x^2 + 42*a^2*b^2*B*d^4*x^2 - 12*b^4*B*c*d^3*x^3 + 12*a*b^3*B*d^4*x^3 - 12*B*d^4*(a + b*x)^4*Log[a + b*x] + 12*B*(b*c - a*d)^2*(a^2*d^2 + 2*a*b*d*(c + 2*d*x) + b^2*(3*c^2 + 8*c*d*x + 6*d^2*x^2))*Log[(e*(a + b*x))/(c + d*x)] + 12*a^4*B*d^4*Log[c + d*x] + 48*a^3*b*B*d^4*x*Log[c + d*x] + 72*a^2*b^2*B*d^4*x^2*Log[c + d*x] + 48*a*b^3*B*d^4*x^3*Log[c + d*x] + 12*b^4*B*d^4*x^4*Log[c + d*x]))/(144*b^3*(b*c - a*d)^2*g^5*(a + b*x)^4)
\end{aligned}$$



---

**Maple [B]** time = 0.05, size = 828, normalized size = 4.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In]  $\int ((d*i*x+c*i)^2*(A+B*\ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5, x)$

[Out]  $\frac{1}{3}e^{3d^2i^2}/(ad-bc)^3/g^5A/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c)^{3a-1}/3e^{3d^2i^2}/(ad-bc)^3/g^5A/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c)^{3b^c-1}/4e^{4d^2i^2}/(ad-bc)^3/g^5A*b/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c)^{4a+1/4}e^{4i^2}/(ad-bc)^3/g^5A*b^2/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c)^{4c+1/3}e^{3d^2i^2}/(ad-bc)^3/g^5B/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c)^{3*\ln(b^e/d+(ad-bc)*e/d/(d*x+c))^a-1/3}e^{3d^2i^2}/(ad-bc)^3/g^5B/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c)^{3*\ln(b^e/d+(ad-bc)*e/d/(d*x+c))^a-1/9}e^{3d^2i^2}/(ad-bc)^3/g^5B/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c)^{3b^c-1/4}e^{4d^2i^2}/(ad-bc)^3/g^5B*b/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c)^{4*\ln(b^e/d+(ad-bc)*e/d/(d*x+c))^a+1/4}e^{4i^2}/(ad-bc)^3/g^5B*b^2/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c)^{4*\ln(b^e/d+(ad-bc)*e/d/(d*x+c))^c-1/16}e^{4d^2i^2}/(ad-bc)^3/g^5B*b/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c)^{4a+1/16}e^{4i^2}/(ad-bc)^3/g^5B*b^2/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c)^{4c}$

---

**Maxima [B]** time = 1.78848, size = 2994, normalized size = 16.54

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In]  $\text{integrate}((d*i*x+c*i)^2*(A+B*\log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5, x, \text{algorithm}="maxima")$

[Out]  $-1/144*B*d^2i^2*(12*(6*b^2*x^2 + 4*a*b*x + a^2)*\log(b^e*x/(d*x + c) + a^e/(d*x + c)))/(b^7*g^5*x^4 + 4*a*b^6*g^5*x^3 + 6*a^2*b^5*g^5*x^2 + 4*a^3*b^4*g^5*x + a^4*b^3*g^5) + (13*a^2*b^3*c^3 - 75*a^3*b^2*c^2*d + 33*a^4*b*c*d^2 - 7*a^5*d^3 - 12*(6*b^5*c^2*d - 4*a*b^4*c*d^2 + a^2*b^3*d^3)*x^3 + 6*(6*b^5*c^3 - 46*a*b^4*c^2*d + 29*a^2*b^3*c*d^2 - 7*a^3*b^2*d^3)*x^2 + 4*(10*a*b^4*c^3 - 63*a^2*b^3*c^2*d + 33*a^3*b^2*c*d^2 - 7*a^4*b*d^3)*x)/(b^10*c^3 - 3*a*b^9*c^2*d + 3*a^2*b^8*c*d^2 - a^3*b^7*d^3)*g^5*x^4 + 4*(a*b^9*c^3 - 3*a^2*b^8*c^2*d + 3*a^3*b^7*c*d^2 - a^4*b^6*d^3)*g^5*x^3 + 6*(a^2*b^8*c^3 - 3*a^$

$$\begin{aligned}
& 3b^7c^2d + 3a^4b^6c^2d^2 - a^5b^5d^3)g^5x^2 + 4(a^3b^7c^3 - 3a^4b^6c^2d + 3a^5b^5c^2d^2 - a^6b^4d^3)g^5x + (a^4b^6c^3 - 3a^5b^5c^2d + 3a^6b^4c^2d^2 - a^7b^3d^3)g^5) - 12(6b^2c^2d^2 - 4a^2b^5c^2d^2 - 4a^3b^4c^2d^3 + a^2d^4) \log(bx + a) / ((b^7c^4 - 4a^2b^6c^3d + 6a^2b^5c^2d^2 - 4a^3b^4c^2d^3 + a^4b^3d^4)g^5) + 12(6b^2c^2d^2 - 4a^2b^5c^2d^3 + a^2d^4) \log(dx + c) / ((b^7c^4 - 4a^2b^6c^3d + 6a^2b^5c^2d^2 - 4a^3b^4c^2d^3 + a^4b^3d^4)g^5) - 1/72Bc^2d^2i^2(12(4bx + a) \log(bex/(dx + c) + ae/(dx + c)) / (b^6g^5x^4 + 4a^2b^5g^5x^3 + 6a^2b^4g^5x^2 + 4a^3b^3g^5x + a^4b^2g^5) + (7a^2b^3c^3 - 33a^2b^2c^2d + 75a^3b^2c^2d^2 - 13a^4d^3 + 12(4b^4c^2d^2 - ab^3d^3))x^3 - 6(4b^4c^2d^2 - 29a^2b^3c^2d^2 + 7a^2b^2d^3)x^2 + 4(4b^4c^3 - 21a^2b^3c^2d + 57a^2b^2c^2d^2 - 13a^3b^2d^3)x) / ((b^9c^3 - 3a^2b^8c^2d + 3a^2b^7c^2d^2 - a^3b^6d^3)g^5x^4 + 4(a^2b^8c^3 - 3a^2b^7c^2d + 3a^3b^6c^2d^2 - a^4b^5d^3)g^5x^3 + 6(a^2b^7c^3 - 3a^3b^6c^2d + 3a^4b^5c^2d^2 - a^5b^4d^3)g^5x^2 + 4(a^3b^6c^3 - 3a^4b^5c^2d + 3a^5b^4c^2d^2 - a^6b^3d^3)g^5x + (a^4b^5c^3 - 3a^5b^4c^2d + 3a^6b^3c^2d^2 - a^7b^2d^3)g^5) + 12(4b^2c^2d^3 - ad^4) \log(bx + a) / ((b^6c^4 - 4a^2b^5c^3d + 6a^2b^4c^2d^2 - 4a^3b^3c^2d^3 + a^4b^2d^4)g^5) - 12(4b^2c^2d^3 - ad^4) \log(dx + c) / ((b^6c^4 - 4a^2b^5c^3d + 6a^2b^4c^2d^2 - 4a^3b^3c^2d^3 + a^4b^2d^4)g^5) + 1/48Bc^2i^2((12b^3d^3x^3 - 3b^3c^3 + 13a^2b^2c^2d - 23a^2b^2c^2d^2 + 25a^3d^3 - 6(b^3c^2d^2 - 7a^2b^2d^3))x^2 + 4(b^3c^2d - 5a^2b^2c^2d^2 + 13a^2b^2d^3)x) / ((b^8c^3 - 3a^2b^7c^2d + 3a^2b^6c^2d^2 - a^3b^5d^3)g^5x^4 + 4(a^2b^7c^3 - 3a^2b^6c^2d + 3a^3b^5c^2d^2 - a^4b^4d^3)g^5x^3 + 6(a^2b^6c^3 - 3a^3b^5c^2d + 3a^4b^4c^2d^2 - a^5b^3d^3)g^5x^2 + 4(a^3b^5c^3 - 3a^4b^4c^2d + 3a^5b^3c^2d^2 - a^6b^2d^3)g^5x + (a^4b^4c^3 - 3a^5b^3c^2d + 3a^6b^2c^2d^2 - a^7b^2d^3)g^5) - 12 \log(bex/(dx + c) + ae/(dx + c)) / (b^5g^5x^4 + 4a^2b^4g^5x^3 + 6a^2b^3g^5x^2 + 4a^3b^2g^5x + a^4b^2g^5) + 12d^4 \log(bx + a) / ((b^5c^4 - 4a^2b^4c^3d + 6a^2b^3c^2d^2 - 4a^3b^2c^2d^3 + a^4b^2d^4)g^5) - 12d^4 \log(dx + c) / ((b^5c^4 - 4a^2b^4c^3d + 6a^2b^3c^2d^2 - 4a^3b^2c^2d^3 + a^4b^2d^4)g^5) - 1/6(4bx + a)A^2c^2d^2i^2 / (b^6g^5x^4 + 4a^2b^5g^5x^3 + 6a^2b^4g^5x^2 + 4a^3b^3g^5x + a^4b^2g^5) - 1/12(6b^2x^2 + 4a^2bx + a^2)A^2d^2i^2 / (b^7g^5x^4 + 4a^2b^6g^5x^3 + 6a^2b^5g^5x^2 + 4a^3b^4g^5x + a^4b^3g^5) - 1/4A^2c^2i^2 / (b^5g^5x^4 + 4a^2b^4g^5x^3 + 6a^2b^3g^5x^2 + 4a^3b^2g^5x + a^4b^2g^5)
\end{aligned}$$

**Fricas [B]** time = 0.813267, size = 1046, normalized size = 5.78

$$\frac{12(Bb^4cd^3 - Bab^3d^4)i^2x^3 - 6((12A + B)b^4c^2d^2 - 8(3A + B)ab^3cd^3 + (12A + 7B)a^2b^2d^4)i^2x^2 - 4((24A + 5B)b^4c^3d - 144((b^9c^2 - 2ab^8cd + a^2b^7d^2))$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5,x, algorithm="fricas")
```

```
[Out] 1/144*(12*(B*b^4*c*d^3 - B*a*b^3*d^4)*i^2*x^3 - 6*((12*A + B)*b^4*c^2*d^2 - 8*(3*A + B)*a*b^3*c*d^3 + (12*A + 7*B)*a^2*b^2*d^4)*i^2*x^2 - 4*((24*A + 5*B)*b^4*c^3*d - 12*(3*A + B)*a*b^3*c^2*d^2 + (12*A + 7*B)*a^3*b*d^4)*i^2*x - (9*(4*A + B)*b^4*c^4 - 16*(3*A + B)*a*b^3*c^3*d + (12*A + 7*B)*a^4*d^4)*i^2 + 12*(B*b^4*d^4*i^2*x^4 + 4*B*a*b^3*d^4*i^2*x^3 - 6*(B*b^4*c^2*d^2 - 2*B*a*b^3*c*d^3)*i^2*x^2 - 4*(2*B*b^4*c^3*d - 3*B*a*b^3*c^2*d^2)*i^2*x - (3*B*b^4*c^4 - 4*B*a*b^3*c^3*d)*i^2)*log((b*e*x + a*e)/(d*x + c)))/((b^9*c^2 - 2*a*b^8*c*d + a^2*b^7*d^2)*g^5*x^4 + 4*(a*b^8*c^2 - 2*a^2*b^7*c*d + a^3*b^6*d^2)*g^5*x^3 + 6*(a^2*b^7*c^2 - 2*a^3*b^6*c*d + a^4*b^5*d^2)*g^5*x^2 + 4*(a^3*b^6*c^2 - 2*a^4*b^5*c*d + a^5*b^4*d^2)*g^5*x + (a^4*b^5*c^2 - 2*a^5*b^4*c*d + a^6*b^3*d^2)*g^5)
```

---

**Sympy [B]** time = 48.2751, size = 928, normalized size = 5.13

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**5,x)
```

```
[Out] -B*d**4*i**2*log(x + (-B*a**3*d**7*i**2/(a*d - b*c)**2 + 3*B*a**2*b*c*d**6*i**2/(a*d - b*c)**2 - 3*B*a*b**2*c**2*d**5*i**2/(a*d - b*c)**2 + B*a*d**5*i**2 + B*b**3*c**3*d**4*i**2/(a*d - b*c)**2 + B*b*c*d**4*i**2)/(2*B*b*d**5*i**2)))/(12*b**3*g**5*(a*d - b*c)**2) + B*d**4*i**2*log(x + (B*a**3*d**7*i**2/(a*d - b*c)**2 - 3*B*a**2*b*c*d**6*i**2/(a*d - b*c)**2 + 3*B*a*b**2*c**2*d**5*i**2/(a*d - b*c)**2 + B*a*d**5*i**2 - B*b**3*c**3*d**4*i**2/(a*d - b*c)**2 + B*b*c*d**4*i**2)/(2*B*b*d**5*i**2)))/(12*b**3*g**5*(a*d - b*c)**2) - (12*A*a**3*d**3*i**2 + 12*A*a**2*b*c*d**2*i**2 + 12*A*a*b**2*c**2*d*i**2 - 36*A*b**3*c**3*i**2 + 7*B*a**3*d**3*i**2 + 7*B*a**2*b*c*d**2*i**2 + 7*B*a*b**2*c**2*d*i**2 - 9*B*b**3*c**3*i**2 + 12*B*b**3*d**3*i**2*x**3 + x**2*(72*A*a*b**2*d**3*i**2 - 72*A*b**3*c*d**2*i**2 + 42*B*a*b**2*d**3*i**2 - 6*B*b**3*c*d**2*i**2) + x*(48*A*a**2*b*d**3*i**2 + 48*A*a*b**2*c*d**2*i**2 - 96*A*b**3*c**2*d*i**2 + 28*B*a**2*b*d**3*i**2 + 28*B*a*b**2*c*d**2*i**2 - 20*B*b**3*c**2*d*i**2))/(144*a**5*b**3*d*g**5 - 144*a**4*b**4*c*g**5 + x**4*(144*a*b**7*d*g**5 - 144*b**8*c*g**5) + x**3*(576*a**2*b**6*d*g**5 - 576*a*b**7*c*g**5) + x**2*(864*a**3*b**5*d*g**5 - 864*a**2*b**6*c*g**5) + x*(576*a**4*b**4*d*g**5 - 576*a**3*b**5*c*g**5)) + (-B*a**2*d**2*i**2 - 2*B*a*b*c*d*i**2
```

$2 - 4B^2abd^2x - 3B^2b^2c^2x^2 - 8B^2b^2cdx - 6B^2b^2d^2x^2) \log(e(a+bx)/(c+dx)) / (12a^4b^3g^5 + 48a^3b^4g^5x + 72a^2b^5g^5x^2 + 48ab^6g^5x^3 + 12b^7g^5x^4)$

**Giac [B]** time = 1.715, size = 783, normalized size = 4.33

$$-\frac{Bd^4 \log(bx + a)}{12(b^5c^2g^5 - 2ab^4cdg^5 + a^2b^3d^2g^5)} + \frac{Bd^4 \log(dx + c)}{12(b^5c^2g^5 - 2ab^4cdg^5 + a^2b^3d^2g^5)} + \frac{(6Bb^2d^2x^2 + 8Bb^2cdx + 4Babd^2x + 3Bb^2d^2x^2)}{12(b^7g^5x^4 + 4ab^6g^5x^3 + 6a^2b^5g^5x^2 + 4a^3b^4g^5x + a^4b^3g^5)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*x+c\*i)^2\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)^5,x, algorith="giac")

[Out]  $-1/12*B*d^4*\log(b*x + a)/(b^5*c^2*g^5 - 2*a*b^4*c*d*g^5 + a^2*b^3*d^2*g^5) + 1/12*B*d^4*\log(d*x + c)/(b^5*c^2*g^5 - 2*a*b^4*c*d*g^5 + a^2*b^3*d^2*g^5) + 1/12*(6*B*b^2*d^2*x^2 + 8*B*b^2*c*d*x + 4*B*a*b*d^2*x + 3*B*b^2*c^2 + 2*B*a*b*c*d + B*a^2*d^2)*\log((b*x + a)/(d*x + c))/(b^7*g^5*x^4 + 4*a*b^6*g^5*x^3 + 6*a^2*b^5*g^5*x^2 + 4*a^3*b^4*g^5*x + a^4*b^3*g^5) - 1/144*(12*B*b^3*d^3*x^3 - 72*A*b^3*c*d^2*x^2 - 78*B*b^3*c*d^2*x^2 + 72*A*a*b^2*d^3*x^2 + 114*B*a*b^2*d^3*x^2 - 96*A*b^3*c^2*d*x - 116*B*b^3*c^2*d*x + 48*A*a*b^2*c*d^2*x + 76*B*a*b^2*c*d^2*x + 48*A*a^2*b*d^3*x + 76*B*a^2*b*d^3*x - 36*A*b^3*c^3 - 45*B*b^3*c^3 + 12*A*a*b^2*c^2*d + 19*B*a*b^2*c^2*d + 12*A*a^2*b*c*d^2 + 19*B*a^2*b*c*d^2 + 12*A*a^3*d^3 + 19*B*a^3*d^3)/(b^8*c*g^5*x^4 - a*b^7*d*g^5*x^4 + 4*a*b^7*c*g^5*x^3 - 4*a^2*b^6*d*g^5*x^3 + 6*a^2*b^6*c*g^5*x^2 - 6*a^3*b^5*d*g^5*x^2 + 4*a^3*b^5*c*g^5*x - 4*a^4*b^4*d*g^5*x + a^4*b^4*c*g^5 - a^5*b^3*d*g^5)$

$$3.19 \quad \int \frac{(ci+dx)^2 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{(ag+bgx)^6} dx$$

**Optimal.** Leaf size=281

$$\frac{b^2 i^2 (c+dx)^5 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{5g^6 (a+bx)^5 (bc-ad)^3} - \frac{d^2 i^2 (c+dx)^3 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{3g^6 (a+bx)^3 (bc-ad)^3} + \frac{bdi^2 (c+dx)^4 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{2g^6 (a+bx)^4 (bc-ad)^3} - \frac{Bd^4 i^2}{25g^6 (a+bx)^5 (bc-ad)^3}$$

[Out]  $-(B*d^2*i^2*(c+d*x)^3)/(9*(b*c-a*d)^3*g^6*(a+b*x)^3) + (b*B*d*i^2*(c+d*x)^4)/(8*(b*c-a*d)^3*g^6*(a+b*x)^4) - (b^2*B*i^2*(c+d*x)^5)/(25*(b*c-a*d)^3*g^6*(a+b*x)^5) - (d^2*i^2*(c+d*x)^3*(A+B*Log[(e*(a+b*x))/(c+d*x)]))/(3*(b*c-a*d)^3*g^6*(a+b*x)^3) + (b*d*i^2*(c+d*x)^4*(A+B*Log[(e*(a+b*x))/(c+d*x)]))/(2*(b*c-a*d)^3*g^6*(a+b*x)^4) - (b^2*i^2*(c+d*x)^5*(A+B*Log[(e*(a+b*x))/(c+d*x)]))/(5*(b*c-a*d)^3*g^6*(a+b*x)^5)$

**Rubi [A]** time = 0.678321, antiderivative size = 359, normalized size of antiderivative = 1.28, number of steps used = 14, number of rules used = 4, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.1$ , Rules used = {2528, 2525, 12, 44}

$$\frac{d^2 i^2 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{3b^3 g^6 (a+bx)^3} - \frac{d i^2 (bc-ad) \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{2b^3 g^6 (a+bx)^4} - \frac{i^2 (bc-ad)^2 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{5b^3 g^6 (a+bx)^5} - \frac{Bd^4 i^2}{30b^3 g^6 (a+bx)(bc-ad)^3}$$

Antiderivative was successfully verified.

[In] Int[((c\*i + d\*i\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]]))/(a\*g + b\*g\*x)^6, x]

[Out]  $-(B*(b*c-a*d)^2*i^2)/(25*b^3*g^6*(a+b*x)^5) - (3*B*d*(b*c-a*d)*i^2)/(40*b^3*g^6*(a+b*x)^4) - (B*d^2*i^2)/(90*b^3*g^6*(a+b*x)^3) + (B*d^3*i^2)/(60*b^3*(b*c-a*d)*g^6*(a+b*x)^2) - (B*d^4*i^2)/(30*b^3*(b*c-a*d)^2*g^6*(a+b*x)) - (B*d^5*i^2*Log[a+b*x])/(30*b^3*(b*c-a*d)^3*g^6) - ((b*c-a*d)^2*i^2*(A+B*Log[(e*(a+b*x))/(c+d*x]]))/(5*b^3*g^6*(a+b*x)^5) - (d*(b*c-a*d)*i^2*(A+B*Log[(e*(a+b*x))/(c+d*x]]))/(2*b^3*g^6*(a+b*x)^4) - (d^2*i^2*(A+B*Log[(e*(a+b*x))/(c+d*x]]))/(3*b^3*g^6*(a+b*x)^3) + (B*d^5*i^2*Log[c+d*x])/(30*b^3*(b*c-a*d)^3*g^6)$

**Rule 2528**

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*(RGx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u

```
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

### Rubi steps

$$\begin{aligned}
\int \frac{(19c + 19dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{(ag + bgx)^6} dx &= \int \left( \frac{361(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2 g^6 (a + bx)^6} + \frac{722d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2 g^6 (a + bx)^5} \right) dx \\
&= \frac{(361d^2) \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{(a+bx)^4} dx}{b^2 g^6} + \frac{(722d(bc - ad)) \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{(a+bx)^5} dx}{b^2 g^6} + \frac{(361(bc - ad)^2) \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{(a+bx)^6} dx}{b^2 g^6} \\
&= -\frac{361(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{5b^3 g^6 (a + bx)^5} - \frac{361d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{2b^3 g^6 (a + bx)^4} - \frac{361d^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^6 (a + bx)^3} \\
&= -\frac{361(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{5b^3 g^6 (a + bx)^5} - \frac{361d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{2b^3 g^6 (a + bx)^4} - \frac{361d^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^6 (a + bx)^3} \\
&= -\frac{361(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{5b^3 g^6 (a + bx)^5} - \frac{361d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{2b^3 g^6 (a + bx)^4} - \frac{361d^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^6 (a + bx)^3} \\
&= -\frac{361B(bc - ad)^2}{25b^3 g^6 (a + bx)^5} - \frac{1083Bd(bc - ad)}{40b^3 g^6 (a + bx)^4} - \frac{361Bd^2}{90b^3 g^6 (a + bx)^3} + \frac{361Bd}{60b^3 (bc - ad) g^6}
\end{aligned}$$

**Mathematica [A]** time = 0.888242, size = 344, normalized size = 1.22

$$i^2 \left( -\frac{360a^2 Ad^2}{(a+bx)^5} - \frac{60B(a^2 d^2 + abd(3c+5dx) + b^2(6c^2 + 15cdx + 10d^2 x^2)) \log \left( \frac{e(a+bx)}{c+dx} \right)}{(a+bx)^5} - \frac{72a^2 Bd^2}{(a+bx)^5} - \frac{360Ab^2 c^2}{(a+bx)^5} - \frac{900Abcd}{(a+bx)^4} + \frac{720aAbcd}{(a+bx)^5} - \frac{600Ad^2}{(a+bx)^3} + \frac{900Ad}{(a+bx)^2} \right)$$

1800b<sup>3</sup>g<sup>6</sup>

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]]))/(a\*g + b\*g\*x)^6,x]

[Out] (i^2\*((-360\*A\*b^2\*c^2)/(a + b\*x)^5 - (72\*b^2\*B\*c^2)/(a + b\*x)^5 + (720\*a\*A\*b\*c\*d)/(a + b\*x)^5 + (144\*a\*b\*B\*c\*d)/(a + b\*x)^5 - (360\*a^2\*A\*d^2)/(a + b\*x)^5 - (72\*a^2\*B\*d^2)/(a + b\*x)^5 - (900\*A\*b\*c\*d)/(a + b\*x)^4 - (135\*b\*B\*c\*d)/(a + b\*x)^4 + (900\*a\*A\*d^2)/(a + b\*x)^4 + (135\*a\*B\*d^2)/(a + b\*x)^4 - (600\*A\*d^2)/(a + b\*x)^3 - (20\*B\*d^2)/(a + b\*x)^3 + (30\*B\*d^3)/((b\*c - a\*d)\*(a + b\*x)^2) - (60\*B\*d^4)/((b\*c - a\*d)^2\*(a + b\*x)) - (60\*B\*d^5\*Log[a + b\*x])/(b\*c - a\*d)^3 - (60\*B\*(a^2\*d^2 + a\*b\*d\*(3\*c + 5\*d\*x) + b^2\*(6\*c^2 + 15\*c\*d\*x + 10\*d^2\*x^2))\*Log[(e\*(a + b\*x))/(c + d\*x]]/(a + b\*x)^5 + (60\*B\*d^5\*Log[c + d\*x])/(b\*c - a\*d)^3))/(1800\*b^3\*g^6)

---

**Maple [B]** time = 0.054, size = 1262, normalized size = 4.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In]  $\text{int}((d*i*x+c*i)^2*(A+B*\ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^6,x)$

[Out]  $\frac{1}{3}e^{3d^3i^2/(ad-bc)^4/g^6A/(b^e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c}^{3a-1} / \frac{1}{3}e^{3d^2i^2/(ad-bc)^4/g^6A/(b^e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c}^{3b*c-1} / \frac{1}{2}e^{4d^2i^2/(ad-bc)^4/g^6A*b/(b^e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c}^{4a} + \frac{1}{2}e^{4d^2i^2/(ad-bc)^4/g^6A*b^2/(b^e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c}^{4c} + \frac{1}{5}e^{5d^2i^2/(ad-bc)^4/g^6A*b^2/(b^e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c}^{5a-1} / \frac{1}{5}e^{5i^2/(ad-bc)^4/g^6A*b^3/(b^e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c}^{5c} + \frac{1}{3}e^{3d^3i^2/(ad-bc)^4/g^6B/(b^e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c}^{3*1} \ln(b^e/d+(ad-bc)*e/d/(d*x+c))*a-1 / \frac{1}{3}e^{3d^2i^2/(ad-bc)^4/g^6B/(b^e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c}^{3*1} \ln(b^e/d+(ad-bc)*e/d/(d*x+c))*b*c + \frac{1}{9}e^{3d^3i^2/(ad-bc)^4/g^6B/(b^e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c}^{3a-1} / \frac{1}{9}e^{3d^2i^2/(ad-bc)^4/g^6B/(b^e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c}^{3b*c-1} / \frac{1}{2}e^{4d^2i^2/(ad-bc)^4/g^6B*b/(b^e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c}^{4*1} \ln(b^e/d+(ad-bc)*e/d/(d*x+c))*a + \frac{1}{2}e^{4d^2i^2/(ad-bc)^4/g^6B*b^2/(b^e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c}^{4*1} \ln(b^e/d+(ad-bc)*e/d/(d*x+c))*c - \frac{1}{8}e^{4d^2i^2/(ad-bc)^4/g^6B*b/(b^e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c}^{4a} + \frac{1}{8}e^{4d^2i^2/(ad-bc)^4/g^6B*b^2/(b^e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c}^{4c} + \frac{1}{5}e^{5d^2i^2/(ad-bc)^4/g^6B*b^2/(b^e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c}^{5*1} \ln(b^e/d+(ad-bc)*e/d/(d*x+c))*a - \frac{1}{5}e^{5i^2/(ad-bc)^4/g^6B*b^3/(b^e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c}^{5*1} \ln(b^e/d+(ad-bc)*e/d/(d*x+c))*c + \frac{1}{25}e^{5d^2i^2/(ad-bc)^4/g^6B*b^2/(b^e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c}^{5a-1} / \frac{1}{25}e^{5i^2/(ad-bc)^4/g^6B*b^3/(b^e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c}^{5c}$

---

**Maxima [B]** time = 2.69166, size = 4089, normalized size = 14.55

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In]  $\text{integrate}((d*i*x+c*i)^2*(A+B*\log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^6,x, \text{algorithm}="maxima")$

[Out]  $-1/1800*B*d^2i^2*(60*(10*b^2*x^2 + 5*a*b*x + a^2)*\log(b^e*x/(d*x + c) + a*e/(d*x + c)))/(b^8*g^6*x^5 + 5*a*b^7*g^6*x^4 + 10*a^2*b^6*g^6*x^3 + 10*a^3*b$



$$\begin{aligned}
& ^5g^6x^2 + 5a^4b^4g^6x + a^5b^3g^6) + (47a^2b^4c^4 - 278a^3b^3 \\
& *c^3d + 822a^4b^2c^2d^2 - 278a^5b^3cd^3 + 47a^6d^4 + 60*(10b^6c^3 \\
& ^2d^2 - 5ab^5cd^3 + a^2b^4d^4)*x^4 - 30*(10b^6c^3d - 95ab^5c^2 \\
& d^2 + 46a^2b^4cd^3 - 9a^3b^3d^4)*x^3 + 10*(20b^6c^4 - 140ab^5c^3 \\
& d + 537a^2b^4c^2d^2 - 248a^3b^3cd^3 + 47a^4b^2d^4)*x^2 + 5*(35 \\
& *ab^5c^4 - 218a^2b^4c^3d + 702a^3b^3c^2d^2 - 278a^4b^2cd^3 + \\
& 47a^5bd^4)*x)/((b^12c^4 - 4ab^11c^3d + 6a^2b^10c^2d^2 - 4a^3b^9 \\
& ^9cd^3 + a^4b^8d^4)*g^6x^5 + 5*(ab^11c^4 - 4a^2b^10c^3d + 6a^3b^9 \\
& ^9c^2d^2 - 4a^4b^8cd^3 + a^5b^7d^4)*g^6x^4 + 10*(a^2b^10c^4 - 4 \\
& ^3b^9c^3d + 6a^4b^8c^2d^2 - 4a^5b^7cd^3 + a^6b^6d^4)*g^6x^3 \\
& + 10*(a^3b^9c^4 - 4a^4b^8c^3d + 6a^5b^7c^2d^2 - 4a^6b^6cd^3 \\
& + a^7b^5d^4)*g^6x^2 + 5*(a^4b^8c^4 - 4a^5b^7c^3d + 6a^6b^6c^2d \\
& ^2 - 4a^7b^5cd^3 + a^8b^4d^4)*g^6x + (a^5b^7c^4 - 4a^6b^6c^3d \\
& + 6a^7b^5c^2d^2 - 4a^8b^4cd^3 + a^9b^3d^4)*g^6) + 60*(10b^2c^2 \\
& ^2d^3 - 5ab^3cd^4 + a^2d^5)*log(b*x + a)/((b^8c^5 - 5ab^7c^4d + 10a^ \\
& ^2b^6c^3d^2 - 10a^3b^5c^2d^3 + 5a^4b^4cd^4 - a^5b^3d^5)*g^6) - \\
& 60*(10b^2c^2d^3 - 5ab^3cd^4 + a^2d^5)*log(d*x + c)/((b^8c^5 - 5ab^ \\
& ^7c^4d + 10a^2b^6c^3d^2 - 10a^3b^5c^2d^3 + 5a^4b^4cd^4 - a^5b^ \\
& ^3d^5)*g^6) - 1/600*B*c*d*i^2*(60*(5b*x + a)*log(b*e*x/(d*x + c) + a*e/( \\
& d*x + c))/(b^7g^6x^5 + 5ab^6g^6x^4 + 10a^2b^5g^6x^3 + 10a^3b^4g \\
& ^6x^2 + 5a^4b^3g^6x + a^5b^2g^6) + (27ab^4c^4 - 148a^2b^3c^3 \\
& d + 352a^3b^2c^2d^2 - 548a^4b^3cd^3 + 77a^5d^4 - 60*(5b^5cd^3 - \\
& ab^4d^4)*x^4 + 30*(5b^5c^2d^2 - 46ab^4cd^3 + 9a^2b^3d^4)*x^3 - \\
& 10*(10b^5c^3d - 67ab^4c^2d^2 + 248a^2b^3cd^3 - 47a^3b^2d^4)*x \\
& ^2 + 5*(15b^5c^4 - 88ab^4c^3d + 232a^2b^3c^2d^2 - 428a^3b^2cd \\
& ^3 + 77a^4bd^4)*x)/((b^11c^4 - 4ab^10c^3d + 6a^2b^9c^2d^2 - 4a^ \\
& ^3b^8cd^3 + a^4b^7d^4)*g^6x^5 + 5*(ab^10c^4 - 4a^2b^9c^3d + 6a^ \\
& ^3b^8c^2d^2 - 4a^4b^7cd^3 + a^5b^6d^4)*g^6x^4 + 10*(a^2b^9c^4 - \\
& 4a^3b^8c^3d + 6a^4b^7c^2d^2 - 4a^5b^6cd^3 + a^6b^5d^4)*g^6x \\
& ^3 + 10*(a^3b^8c^4 - 4a^4b^7c^3d + 6a^5b^6c^2d^2 - 4a^6b^5cd^ \\
& 3 + a^7b^4d^4)*g^6x^2 + 5*(a^4b^7c^4 - 4a^5b^6c^3d + 6a^6b^5c^2 \\
& ^2d^2 - 4a^7b^4cd^3 + a^8b^3d^4)*g^6x + (a^5b^6c^4 - 4a^6b^5c^3 \\
& d + 6a^7b^4c^2d^2 - 4a^8b^3cd^3 + a^9b^2d^4)*g^6) - 60*(5b^3cd^4 \\
& - ad^5)*log(b*x + a)/((b^7c^5 - 5ab^6c^4d + 10a^2b^5c^3d^2 - 10 \\
& ^3b^4c^2d^3 + 5a^4b^3cd^4 - a^5b^2d^5)*g^6) + 60*(5b^3cd^4 - ad \\
& ^5)*log(d*x + c)/((b^7c^5 - 5ab^6c^4d + 10a^2b^5c^3d^2 - 10a^3b^ \\
& ^4c^2d^3 + 5a^4b^3cd^4 - a^5b^2d^5)*g^6) - 1/300*B*c^2*i^2*((60b^4 \\
& ^4d^4*x^4 + 12b^4c^4 - 63ab^3c^3d + 137a^2b^2c^2d^2 - 163a^3b^3c \\
& ^3d + 137a^4d^4 - 30*(b^4cd^3 - 9ab^3d^4)*x^3 + 10*(2b^4c^2d^2 - \\
& 13ab^3cd^3 + 47a^2b^2d^4)*x^2 - 5*(3b^4c^3d - 17ab^3c^2d^2 + \\
& 43a^2b^2cd^3 - 77a^3bd^4)*x)/((b^10c^4 - 4ab^9c^3d + 6a^2b^8c^ \\
& ^2d^2 - 4a^3b^7cd^3 + a^4b^6d^4)*g^6x^5 + 5*(ab^9c^4 - 4a^2b^8 \\
& ^8c^3d + 6a^3b^7c^2d^2 - 4a^4b^6cd^3 + a^5b^5d^4)*g^6x^4 + 10*(a \\
& ^2b^8c^4 - 4a^3b^7c^3d + 6a^4b^6c^2d^2 - 4a^5b^5cd^3 + a^6b^ \\
& ^4d^4)*g^6x^3 + 10*(a^3b^7c^4 - 4a^4b^6c^3d + 6a^5b^5c^2d^2 - 4*
\end{aligned}$$

$$\begin{aligned}
& a^6 b^4 c^3 d^3 + a^7 b^3 d^4) g^6 x^2 + 5(a^4 b^6 c^4 - 4a^5 b^5 c^3 d + 6 \\
& a^6 b^4 c^2 d^2 - 4a^7 b^3 c^2 d^2 + a^8 b^2 d^4) g^6 x + (a^5 b^5 c^4 - 4a^6 \\
& a^6 b^4 c^3 d + 6a^7 b^3 c^2 d^2 - 4a^8 b^2 c^2 d^3 + a^9 b^2 d^4) g^6) + 60 * \\
& \log(b * e * x / (d * x + c) + a * e / (d * x + c)) / (b^6 g^6 x^5 + 5 * a * b^5 g^6 x^4 + 10 * a^2 \\
& 2 * b^4 g^6 x^3 + 10 * a^3 b^3 g^6 x^2 + 5 * a^4 b^2 g^6 x + a^5 b g^6) + 60 * d^5 * \\
& \log(b * x + a) / ((b^6 c^5 - 5 * a * b^5 c^4 d + 10 * a^2 b^4 c^3 d^2 - 10 * a^3 b^3 c^2 \\
& 2 * d^3 + 5 * a^4 b^2 c^2 d^4 - a^5 b^2 d^5) * g^6) - 60 * d^5 * \log(d * x + c) / ((b^6 c^5 - \\
& 5 * a * b^5 c^4 d + 10 * a^2 b^4 c^3 d^2 - 10 * a^3 b^3 c^2 d^3 + 5 * a^4 b^2 c^2 d^4 \\
& - a^5 b^2 d^5) * g^6)) - 1/10 * (5 * b * x + a) * A * c * d * i^2 / (b^7 g^6 x^5 + 5 * a * b^6 g^6 x^4 \\
& x^4 + 10 * a^2 b^5 g^6 x^3 + 10 * a^3 b^4 g^6 x^2 + 5 * a^4 b^3 g^6 x + a^5 b^2 g^6 x^2) \\
& - 1/30 * (10 * b^2 x^2 + 5 * a * b * x + a^2) * A * d^2 * i^2 / (b^8 g^6 x^5 + 5 * a * b^7 g^6 x^4 \\
& 6 * x^4 + 10 * a^2 b^6 g^6 x^3 + 10 * a^3 b^5 g^6 x^2 + 5 * a^4 b^4 g^6 x + a^5 b^3 g^6 x^3 \\
& * g^6) - 1/5 * A * c^2 * i^2 / (b^6 g^6 x^5 + 5 * a * b^5 g^6 x^4 + 10 * a^2 b^4 g^6 x^3 + \\
& 10 * a^3 b^3 g^6 x^2 + 5 * a^4 b^2 g^6 x + a^5 b g^6)
\end{aligned}$$

**Fricas [B]** time = 0.796824, size = 1661, normalized size = 5.91

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^6,x, algorithm="fricas")
```

```
[Out] -1/1800*(60*(B*b^5*c*d^4 - B*a*b^4*d^5)*i^2*x^4 - 30*(B*b^5*c^2*d^3 - 10*B*a*b^4*c*d^4 + 9*B*a^2*b^3*d^5)*i^2*x^3 + 10*(2*(30*A + B)*b^5*c^3*d^2 - 15*(12*A + B)*a*b^4*c^2*d^3 + 60*(3*A + B)*a^2*b^3*c*d^4 - (60*A + 47*B)*a^3*b^2*d^5)*i^2*x^2 + 5*(9*(20*A + 3*B)*b^5*c^4*d - 20*(24*A + 5*B)*a*b^4*c^3*d^2 + 120*(3*A + B)*a^2*b^3*c^2*d^3 - (60*A + 47*B)*a^4*b*d^5)*i^2*x + (72*(5*A + B)*b^5*c^5 - 225*(4*A + B)*a*b^4*c^4*d + 200*(3*A + B)*a^2*b^3*c^3*d^2 - (60*A + 47*B)*a^5*d^5)*i^2 + 60*(B*b^5*d^5*i^2*x^5 + 5*B*a*b^4*d^5*i^2*x^4 + 10*B*a^2*b^3*d^5*i^2*x^3 + 10*(B*b^5*c^3*d^2 - 3*B*a*b^4*c^2*d^3 + 3*B*a^2*b^3*c*d^4)*i^2*x^2 + 5*(3*B*b^5*c^4*d - 8*B*a*b^4*c^3*d^2 + 6*B*a^2*b^3*c^2*d^3)*i^2*x + (6*B*b^5*c^5 - 15*B*a*b^4*c^4*d + 10*B*a^2*b^3*c^3*d^2)*i^2)*log((b*e*x + a*e)/(d*x + c)) / ((b^11*c^3 - 3*a*b^10*c^2*d + 3*a^2*b^9*c*d^2 - a^3*b^8*d^3)*g^6*x^5 + 5*(a*b^10*c^3 - 3*a^2*b^9*c^2*d + 3*a^3*b^8*c*d^2 - a^4*b^7*d^3)*g^6*x^4 + 10*(a^2*b^9*c^3 - 3*a^3*b^8*c^2*d + 3*a^4*b^7*c*d^2 - a^5*b^6*d^3)*g^6*x^3 + 10*(a^3*b^8*c^3 - 3*a^4*b^7*c^2*d + 3*a^5*b^6*c*d^2 - a^6*b^5*d^3)*g^6*x^2 + 5*(a^4*b^7*c^3 - 3*a^5*b^6*c^2*d + 3*a^6*b^5*c*d^2 - a^7*b^4*d^3)*g^6*x + (a^5*b^6*c^3 - 3*a^6*b^5*c^2*d + 3*a^7*b^4*c*d^2 - a^8*b^3*d^3)*g^6)
```

---

**Sympy [B]** time = 88.4711, size = 1300, normalized size = 4.63

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*\*2\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)\*\*6,x)

[Out] 
$$-B*d^{5*i}*\log(x + (-B*a^{4*d}d^{9*i}/(a*d - b*c)^3 + 4*B*a^{3*b}c*d^{8*i}/(a*d - b*c)^3 - 6*B*a^{2*b}c^2*d^{7*i}/(a*d - b*c)^3 + 4*B*a*b^{3*c}d^{6*i}/(a*d - b*c)^3 + B*a*d^{6*i} - B*b^{4*c}d^{5*i}/(a*d - b*c)^3 + B*b*c*d^{5*i})/(2*B*b*d^{6*i})/(30*b^{3*g}g^6*(a*d - b*c)^3) + B*d^{5*i}*\log(x + (B*a^{4*d}d^{9*i}/(a*d - b*c)^3 - 4*B*a^{3*b}c*d^{8*i}/(a*d - b*c)^3 + 6*B*a^{2*b}c^2*d^{7*i}/(a*d - b*c)^3 - 4*B*a*b^{3*c}d^{6*i}/(a*d - b*c)^3 + B*a*d^{6*i} + B*b^{4*c}d^{5*i}/(a*d - b*c)^3 + B*b*c*d^{5*i})/(2*B*b*d^{6*i})/(30*b^{3*g}g^6*(a*d - b*c)^3) - (60*A*a^{4*d}d^{4*i} + 60*A*a^{3*b}c*d^{3*i} + 60*A*a^{2*b}c^2*d^{2*i} - 540*A*a*b^{3*c}d^{i} + 360*A*b^{4*c}d^{i} + 47*B*a^{4*d}d^{4*i} + 47*B*a^{3*b}c*d^{3*i} + 47*B*a^{2*b}c^2*d^{2*i} - 153*B*a*b^{3*c}d^{i} + 72*B*b^{4*c}d^{i} + 60*B*b^{4*d}d^{4*i}x^4 + x^3*(270*B*a*b^{3*c}d^{4*i} - 30*B*b^{4*c}d^{3*i}) + x^2*(600*A*a^{2*b}c^2*d^{4*i} - 1200*A*a*b^{3*c}d^{3*i} + 600*A*b^{4*c}d^{2*i} + 470*B*a^{2*b}c^2*d^{4*i} - 130*B*a*b^{3*c}d^{3*i} + 20*B*b^{4*c}d^{2*i}) + x*(300*A*a^{3*b}c*d^{4*i} + 300*A*a^{2*b}c^2*d^{3*i} - 1500*A*a*b^{3*c}d^{2*i} + 900*A*b^{4*c}d^{3*i} + 235*B*a^{3*b}b*d^{4*i} + 235*B*a^{2*b}c^2*d^{3*i} - 365*B*a*b^{3*c}d^{2*i} + 135*B*b^{4*c}d^{3*i})/(1800*a^{7*b}b^{3*d}g^6 - 3600*a^{6*b}b^{4*c}d*g^6 + 1800*a^{5*b}b^{5*c}g^6 + x^5*(1800*a^{2*b}b^{8*d}g^6 - 3600*a*b^{9*c}d*g^6 + 1800*b^{10*c}g^6) + x^4*(9000*a^{3*b}b^{7*d}g^6 - 18000*a^{2*b}b^{8*c}d*g^6 + 9000*a*b^{9*c}g^6) + x^3*(18000*a^{4*b}b^{6*d}g^6 - 36000*a^{3*b}b^{7*c}d*g^6 + 18000*a^{2*b}b^{8*c}g^6) + x^2*(18000*a^{5*b}b^{5*d}g^6 - 36000*a^{4*b}b^{6*c}d*g^6 + 18000*a^{3*b}b^{7*c}g^6) + x*(9000*a^{6*b}b^{4*d}g^6 - 18000*a^{5*b}b^{5*c}d*g^6 + 9000*a^{4*b}b^{6*c}g^6) + (-B*a^{2*d}d^{2*i} - 3*B*a*b*c*d^{i} - 5*B*a*b*d^{2*i}x - 6*B*b^{2*c}d^{2*i} - 15*B*b^{2*c}d^{i}x - 10*B*b^{2*d}d^{2*i}x^2)*\log(e*(a + b*x)/(c + d*x))/(30*a^{5*b}b^{3*g}g^6 + 150*a^{4*b}b^{4*g}g^6*x + 300*a^{3*b}b^{5*g}g^6*x^2 + 300*a^{2*b}b^{6*g}g^6*x^3 + 150*a*b^{7*g}g^6*x^4 + 30*b^{8*g}g^6*x^5)$$

---

**Giac [B]** time = 1.41879, size = 1211, normalized size = 4.31

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^6,x, algorithm="giac")
```

```
[Out] 1/30*B*d^5*log(b*x + a)/(b^6*c^3*g^6 - 3*a*b^5*c^2*d*g^6 + 3*a^2*b^4*c*d^2*g^6 - a^3*b^3*d^3*g^6) - 1/30*B*d^5*log(d*x + c)/(b^6*c^3*g^6 - 3*a*b^5*c^2*d*g^6 + 3*a^2*b^4*c*d^2*g^6 - a^3*b^3*d^3*g^6) + 1/30*(10*B*b^2*d^2*x^2 + 15*B*b^2*c*d*x + 5*B*a*b*d^2*x + 6*B*b^2*c^2 + 3*B*a*b*c*d + B*a^2*d^2)*log((b*x + a)/(d*x + c))/(b^8*g^6*x^5 + 5*a*b^7*g^6*x^4 + 10*a^2*b^6*g^6*x^3 + 10*a^3*b^5*g^6*x^2 + 5*a^4*b^4*g^6*x + a^5*b^3*g^6) + 1/1800*(60*B*b^4*d^4*x^4 - 30*B*b^4*c*d^3*x^3 + 270*B*a*b^3*d^4*x^3 + 600*A*b^4*c^2*d^2*x^2 + 620*B*b^4*c^2*d^2*x^2 - 1200*A*a*b^3*c*d^3*x^2 - 1330*B*a*b^3*c*d^3*x^2 + 600*A*a^2*b^2*d^4*x^2 + 1070*B*a^2*b^2*d^4*x^2 + 900*A*b^4*c^3*d*x + 1035*B*b^4*c^3*d*x - 1500*A*a*b^3*c^2*d^2*x - 1865*B*a*b^3*c^2*d^2*x + 300*A*a^2*b^2*c*d^3*x + 535*B*a^2*b^2*c*d^3*x + 300*A*a^3*b*d^4*x + 535*B*a^3*b*d^4*x + 360*A*b^4*c^4 + 432*B*b^4*c^4 - 540*A*a*b^3*c^3*d - 693*B*a*b^3*c^3*d + 60*A*a^2*b^2*c^2*d^2 + 107*B*a^2*b^2*c^2*d^2 + 60*A*a^3*b*c*d^3 + 107*B*a^3*b*c*d^3 + 60*A*a^4*d^4 + 107*B*a^4*d^4)/(b^10*c^2*g^6*x^5 - 2*a*b^9*c*d*g^6*x^5 + a^2*b^8*d^2*g^6*x^5 + 5*a*b^9*c^2*g^6*x^4 - 10*a^2*b^8*c*d*g^6*x^4 + 5*a^3*b^7*d^2*g^6*x^4 + 10*a^2*b^8*c^2*g^6*x^3 - 20*a^3*b^7*c*d*g^6*x^3 + 10*a^4*b^6*d^2*g^6*x^3 + 10*a^3*b^7*c^2*g^6*x^2 - 20*a^4*b^6*c*d*g^6*x^2 + 10*a^5*b^5*d^2*g^6*x^2 + 5*a^4*b^6*c^2*g^6*x - 10*a^5*b^5*c*d*g^6*x + 5*a^6*b^4*d^2*g^6*x + a^5*b^5*c^2*g^6 - 2*a^6*b^4*c*d*g^6 + a^7*b^3*d^2*g^6)
```

$$3.20 \quad \int (ag + bgx)^3 (ci + dix)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) dx$$

**Optimal.** Leaf size=457

$$\frac{b^2 g^3 i^3 (c + dx)^6 (bc - ad) \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{2d^4} + \frac{b^3 g^3 i^3 (c + dx)^7 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{7d^4} - \frac{g^3 i^3 (c + dx)^4 (bc - ad)^3 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{4d^4}$$

[Out] (B\*(b\*c - a\*d)^6\*g^3\*i^3\*x)/(140\*b^3\*d^3) + (B\*(b\*c - a\*d)^5\*g^3\*i^3\*(c + d\*x)^2)/(280\*b^2\*d^4) + (B\*(b\*c - a\*d)^4\*g^3\*i^3\*(c + d\*x)^3)/(420\*b\*d^4) - (17\*B\*(b\*c - a\*d)^3\*g^3\*i^3\*(c + d\*x)^4)/(280\*d^4) + (b\*B\*(b\*c - a\*d)^2\*g^3\*i^3\*(c + d\*x)^5)/(14\*d^4) - (b^2\*B\*(b\*c - a\*d)\*g^3\*i^3\*(c + d\*x)^6)/(42\*d^4) + (B\*(b\*c - a\*d)^7\*g^3\*i^3\*Log[(a + b\*x)/(c + d\*x)])/(140\*b^4\*d^4) - ((b\*c - a\*d)^3\*g^3\*i^3\*(c + d\*x)^4\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]]))/(4\*d^4) + (3\*b\*(b\*c - a\*d)^2\*g^3\*i^3\*(c + d\*x)^5\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]]))/(5\*d^4) - (b^2\*(b\*c - a\*d)\*g^3\*i^3\*(c + d\*x)^6\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]]))/(2\*d^4) + (b^3\*g^3\*i^3\*(c + d\*x)^7\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]]))/(7\*d^4) + (B\*(b\*c - a\*d)^7\*g^3\*i^3\*Log[c + d\*x])/(140\*b^4\*d^4)

**Rubi [A]** time = 0.944784, antiderivative size = 416, normalized size of antiderivative = 0.91, number of steps used = 18, number of rules used = 4, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.1$ , Rules used = {2528, 2525, 12, 43}

$$\frac{d^2 g^3 i^3 (a + bx)^6 (bc - ad) \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{2b^4} + \frac{d^3 g^3 i^3 (a + bx)^7 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{7b^4} + \frac{g^3 i^3 (a + bx)^4 (bc - ad)^3 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{4b^4}$$

Antiderivative was successfully verified.

[In] Int[(a\*g + b\*g\*x)^3\*(c\*i + d\*i\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]),x]

[Out] -(B\*(b\*c - a\*d)^6\*g^3\*i^3\*x)/(140\*b^3\*d^3) + (B\*(b\*c - a\*d)^5\*g^3\*i^3\*(a + b\*x)^2)/(280\*b^4\*d^2) - (B\*(b\*c - a\*d)^4\*g^3\*i^3\*(a + b\*x)^3)/(420\*b^4\*d) - (17\*B\*(b\*c - a\*d)^3\*g^3\*i^3\*(a + b\*x)^4)/(280\*b^4) - (B\*d\*(b\*c - a\*d)^2\*g^3\*i^3\*(a + b\*x)^5)/(14\*b^4) - (B\*d^2\*(b\*c - a\*d)\*g^3\*i^3\*(a + b\*x)^6)/(42\*b^4) + ((b\*c - a\*d)^3\*g^3\*i^3\*(a + b\*x)^4\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]]))/(4\*b^4) + (3\*d\*(b\*c - a\*d)^2\*g^3\*i^3\*(a + b\*x)^5\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]]))/(5\*b^4) + (d^2\*(b\*c - a\*d)\*g^3\*i^3\*(a + b\*x)^6\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]]))/(2\*b^4) + (d^3\*g^3\*i^3\*(a + b\*x)^7\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]]))/(7\*b^4) + (B\*(b\*c - a\*d)^7\*g^3\*i^3\*Log[c + d\*x])/(140\*b^4\*d^4)

40\*b^4\*d^4)

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*
(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

### Rubi steps

$$\begin{aligned}
\int (20c + 20dx)^3 (ag + bgx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) dx &= \int \left( \frac{(-bc + ad)^3 g^3 (20c + 20dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{d^3} + \frac{3b(20c + 20dx)^3 (ag + bgx)^3}{d^3} \right) dx \\
&= \frac{(b^3 g^3) \int (20c + 20dx)^6 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) dx}{8000d^3} - \frac{3b^2 (bc - ad)^3 g^3 (20c + 20dx)^3}{8000d^3} \\
&= -\frac{2000(bc - ad)^3 g^3 (c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{d^4} + \frac{4800b(bc - ad)^3 g^3}{d^4} \\
&= -\frac{2000(bc - ad)^3 g^3 (c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{d^4} + \frac{4800b(bc - ad)^3 g^3}{d^4} \\
&= -\frac{2000(bc - ad)^3 g^3 (c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{d^4} + \frac{4800b(bc - ad)^3 g^3}{d^4} \\
&= \frac{400B(bc - ad)^6 g^3 x}{7b^3 d^3} + \frac{200B(bc - ad)^5 g^3 (c + dx)^2}{7b^2 d^4} + \frac{400B(bc - ad)^4 g^3}{7b d^5}
\end{aligned}$$

**Mathematica [A]** time = 0.590608, size = 586, normalized size = 1.28

$$\frac{g^3 i^3 \left( 420d^2 (a + bx)^6 (bc - ad) \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right) + 120d^3 (a + bx)^7 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right) + 210(a + bx)^4 (bc - ad)^3 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right) \right)}{7b^3 d^3} + \frac{200B(bc - ad)^5 g^3 (c + dx)^2}{7b^2 d^4} + \frac{400B(bc - ad)^4 g^3}{7b d^5}$$

Antiderivative was successfully verified.

[In] Integrate[(a\*g + b\*g\*x)^3\*(c+i + d\*i\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])/d^3, x]

[Out] (g^3\*i^3\*((120\*b^2\*B\*c\*(b\*c - a\*d)^5\*x)/d^3 - (126\*b\*B\*(b\*c - a\*d)^6\*x)/d^3 + (120\*a\*b\*B\*(-(b\*c) + a\*d)^5\*x)/d^2 - (60\*b\*B\*c\*(b\*c - a\*d)^4\*(a + b\*x)^2)/d^2 + (60\*a\*B\*(b\*c - a\*d)^4\*(a + b\*x)^2)/d + (63\*B\*(b\*c - a\*d)^5\*(a + b\*x)^2)/d^2 + (40\*b\*B\*c\*(b\*c - a\*d)^3\*(a + b\*x)^3)/d - (42\*B\*(b\*c - a\*d)^4\*(a + b\*x)^3)/d + 40\*a\*B\*(-(b\*c) + a\*d)^3\*(a + b\*x)^3 - 30\*b\*B\*c\*(b\*c - a\*d)^2\*(a + b\*x)^4 + 30\*a\*B\*d\*(b\*c - a\*d)^2\*(a + b\*x)^4 + 21\*B\*(-(b\*c) + a\*d)^3\*(a + b\*x)^4 + 24\*b\*B\*c\*d\*(b\*c - a\*d)\*(a + b\*x)^5 - 84\*B\*d\*(b\*c - a\*d)^2\*(a + b\*x)^5 + 24\*a\*B\*d^2\*(-(b\*c) + a\*d)\*(a + b\*x)^5 - 20\*b\*B\*c\*d^2\*(a + b\*x)^6 + 20\*a\*B\*d^3\*(a + b\*x)^6 + 210\*(b\*c - a\*d)^3\*(a + b\*x)^4\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) + 504\*d\*(b\*c - a\*d)^2\*(a + b\*x)^5\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) + 420\*d^2\*(b\*c - a\*d)\*(a + b\*x)^6\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) + 120\*d^3\*(a + b\*x)^7\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) - (120\*b\*B\*c\*(b\*c - a\*d)^6\*Log[c + d\*x])/d^4 + (120\*a\*B\*(b\*c - a\*d)^6\*Log[c + d\*x])/d^4

)]/d^3 + (126\*B\*(b\*c - a\*d)^7\*Log[c + d\*x])/d^4))/(840\*b^4)

**Maple [B]** time = 0.222, size = 11172, normalized size = 24.5

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^3\*(d\*i\*x+c\*i)^3\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c))),x)

[Out] result too large to display

**Maxima [B]** time = 1.52151, size = 3560, normalized size = 7.79

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(d\*i\*x+c\*i)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c))),x, algorithm="maxima")

[Out]  $\frac{1}{7}A*b^3*d^3*g^3*i^3*x^7 + \frac{1}{2}A*b^3*c*d^2*g^3*i^3*x^6 + \frac{1}{2}A*a*b^2*d^3*g^3*i^3*x^6 + \frac{3}{5}A*b^3*c^2*d*g^3*i^3*x^5 + \frac{9}{5}A*a*b^2*c*d^2*g^3*i^3*x^5 + \frac{3}{5}A*a^2*b*d^3*g^3*i^3*x^5 + \frac{1}{4}A*b^3*c^3*g^3*i^3*x^4 + \frac{9}{4}A*a*b^2*c^2*d*g^3*i^3*x^4 + \frac{9}{4}A*a^2*b*c*d^2*g^3*i^3*x^4 + \frac{1}{4}A*a^3*d^3*g^3*i^3*x^4 + A*a*b^2*c^3*g^3*i^3*x^3 + 3A*a^2*b*c^2*d*g^3*i^3*x^3 + A*a^3*c*d^2*g^3*i^3*x^3 + \frac{3}{2}A*a^2*b*c^3*g^3*i^3*x^2 + \frac{3}{2}A*a^3*c^2*d*g^3*i^3*x^2 + (x*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) + a*\log(b*x + a)/b - c*\log(d*x + c)/d)*B*a^3*c^3*g^3*i^3 + \frac{3}{2}*(x^2*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*\log(b*x + a)/b^2 + c^2*\log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*B*a^2*b*c^3*g^3*i^3 + \frac{1}{2}*(2*x^3*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*\log(b*x + a)/b^3 - 2*c^3*\log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*a*b^2*c^3*g^3*i^3 + \frac{1}{24}*(6*x^4*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*\log(b*x + a)/b^4 + 6*c^4*\log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*b^3*c^3*g^3*i^3 + \frac{3}{2}*(x^2*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*\log(b*x + a)/b^2 + c^2*\log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*B*a^3*c^2*d*g^3*i^3 + \frac{3}{2}*(2*x^3*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*\log(b*x + a)/b^3 - 2*c^3*\log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2$



$$\begin{aligned}
&*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*a^2*b*c^2*d*g^3*i^3 + 3/8*(6*x^4*\log(b \\
&*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*\log(b*x + a)/b^4 + 6*c^4*\log(d*x + \\
&c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6 \\
&*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*a*b^2*c^2*d*g^3*i^3 + 1/20*(12*x^5*\log \\
&(b*e*x/(d*x + c) + a*e/(d*x + c)) + 12*a^5*\log(b*x + a)/b^5 - 12*c^5*\log(d*x \\
&+ c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4) \\
&*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4)) \\
&*B*b^3*c^2*d*g^3*i^3 + 1/2*(2*x^3*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2* \\
&a^3*\log(b*x + a)/b^3 - 2*c^3*\log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - \\
&2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*a^3*c*d^2*g^3*i^3 + 3/8*(6*x^4*\log(b* \\
&e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*\log(b*x + a)/b^4 + 6*c^4*\log(d*x + c \\
&)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6* \\
&(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*a^2*b*c*d^2*g^3*i^3 + 3/20*(12*x^5*\log( \\
&b*e*x/(d*x + c) + a*e/(d*x + c)) + 12*a^5*\log(b*x + a)/b^5 - 12*c^5*\log(d*x \\
&+ c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)* \\
&x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))* \\
&B*a*b^2*c*d^2*g^3*i^3 + 1/120*(60*x^6*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) \\
&- 60*a^6*\log(b*x + a)/b^6 + 60*c^6*\log(d*x + c)/d^6 - (12*(b^5*c*d^4 - a*b^ \\
&4*d^5)*x^5 - 15*(b^5*c^2*d^3 - a^2*b^3*d^5)*x^4 + 20*(b^5*c^3*d^2 - a^3*b^2 \\
&*d^5)*x^3 - 30*(b^5*c^4*d - a^4*b*d^5)*x^2 + 60*(b^5*c^5 - a^5*d^5)*x)/(b^5 \\
&*d^5))*B*b^3*c*d^2*g^3*i^3 + 1/24*(6*x^4*\log(b*e*x/(d*x + c) + a*e/(d*x + c \\
&)) - 6*a^4*\log(b*x + a)/b^4 + 6*c^4*\log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^ \\
&2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3* \\
&d^3))*B*a^3*d^3*g^3*i^3 + 1/20*(12*x^5*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) \\
&+ 12*a^5*\log(b*x + a)/b^5 - 12*c^5*\log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^ \\
&3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)* \\
&x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*B*a^2*b*d^3*g^3*i^3 + 1/120*(60* \\
&x^6*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 60*a^6*\log(b*x + a)/b^6 + 60*c^6 \\
&*\log(d*x + c)/d^6 - (12*(b^5*c*d^4 - a*b^4*d^5)*x^5 - 15*(b^5*c^2*d^3 - a^2 \\
&*b^3*d^5)*x^4 + 20*(b^5*c^3*d^2 - a^3*b^2*d^5)*x^3 - 30*(b^5*c^4*d - a^4*b \\
&*d^5)*x^2 + 60*(b^5*c^5 - a^5*d^5)*x)/(b^5*d^5))*B*a*b^2*d^3*g^3*i^3 + 1/420 \\
&*(60*x^7*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 60*a^7*\log(b*x + a)/b^7 - 6 \\
&0*c^7*\log(d*x + c)/d^7 - (10*(b^6*c*d^5 - a*b^5*d^6)*x^6 - 12*(b^6*c^2*d^4 \\
&- a^2*b^4*d^6)*x^5 + 15*(b^6*c^3*d^3 - a^3*b^3*d^6)*x^4 - 20*(b^6*c^4*d^2 - \\
&a^4*b^2*d^6)*x^3 + 30*(b^6*c^5*d - a^5*b*d^6)*x^2 - 60*(b^6*c^6 - a^6*d^6) \\
&*x)/(b^6*d^6))*B*b^3*d^3*g^3*i^3 + A*a^3*c^3*g^3*i^3*x
\end{aligned}$$


---

**Fricas [B]** time = 1.79378, size = 1894, normalized size = 4.14

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c))),x, algor
ithm="fricas")
```

```
[Out] 1/840*(120*A*b^7*d^7*g^3*i^3*x^7 + 20*((21*A - B)*b^7*c*d^6 + (21*A + B)*a*
b^6*d^7)*g^3*i^3*x^6 + 12*((42*A - 5*B)*b^7*c^2*d^5 + 126*A*a*b^6*c*d^6 + (
42*A + 5*B)*a^2*b^5*d^7)*g^3*i^3*x^5 + 3*((70*A - 17*B)*b^7*c^3*d^4 + 7*(90
*A - 7*B)*a*b^6*c^2*d^5 + 7*(90*A + 7*B)*a^2*b^5*c*d^6 + (70*A + 17*B)*a^3*
b^4*d^7)*g^3*i^3*x^4 - 2*(B*b^7*c^4*d^3 - 14*(30*A - 7*B)*a*b^6*c^3*d^4 - 1
260*A*a^2*b^5*c^2*d^5 - 14*(30*A + 7*B)*a^3*b^4*c*d^6 - B*a^4*b^3*d^7)*g^3*
i^3*x^3 + 3*(B*b^7*c^5*d^2 - 7*B*a*b^6*c^4*d^3 + 84*(5*A - B)*a^2*b^5*c^3*d
^4 + 84*(5*A + B)*a^3*b^4*c^2*d^5 + 7*B*a^4*b^3*c*d^6 - B*a^5*b^2*d^7)*g^3*
i^3*x^2 - 6*(B*b^7*c^6*d - 7*B*a*b^6*c^5*d^2 + 21*B*a^2*b^5*c^4*d^3 - 140*A
*a^3*b^4*c^3*d^4 - 21*B*a^4*b^3*c^2*d^5 + 7*B*a^5*b^2*c*d^6 - B*a^6*b*d^7)*
g^3*i^3*x + 6*(35*B*a^4*b^3*c^3*d^4 - 21*B*a^5*b^2*c^2*d^5 + 7*B*a^6*b*c*d^
6 - B*a^7*d^7)*g^3*i^3*log(b*x + a) + 6*(B*b^7*c^7 - 7*B*a*b^6*c^6*d + 21*B
*a^2*b^5*c^5*d^2 - 35*B*a^3*b^4*c^4*d^3)*g^3*i^3*log(d*x + c) + 6*(20*B*b^7
*d^7*g^3*i^3*x^7 + 140*B*a^3*b^4*c^3*d^4*g^3*i^3*x + 70*(B*b^7*c*d^6 + B*a*
b^6*d^7)*g^3*i^3*x^6 + 84*(B*b^7*c^2*d^5 + 3*B*a*b^6*c*d^6 + B*a^2*b^5*d^7)
*g^3*i^3*x^5 + 35*(B*b^7*c^3*d^4 + 9*B*a*b^6*c^2*d^5 + 9*B*a^2*b^5*c*d^6 +
B*a^3*b^4*d^7)*g^3*i^3*x^4 + 140*(B*a*b^6*c^3*d^4 + 3*B*a^2*b^5*c^2*d^5 + B
*a^3*b^4*c*d^6)*g^3*i^3*x^3 + 210*(B*a^2*b^5*c^3*d^4 + B*a^3*b^4*c^2*d^5)*g
^3*i^3*x^2)*log((b*e*x + a*e)/(d*x + c))/(b^4*d^4)
```

---

**Sympy [B]** time = 20.5444, size = 2188, normalized size = 4.79

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] A*b**3*d**3*g**3*i**3*x**7/7 - B*a**4*g**3*i**3*(a**3*d**3 - 7*a**2*b*c*d**
2 + 21*a*b**2*c**2*d - 35*b**3*c**3)*log(x + (B*a**7*c*d**6*g**3*i**3 - 7*B
*a**6*b*c**2*d**5*g**3*i**3 + 21*B*a**5*b**2*c**3*d**4*g**3*i**3 + B*a**5*d
**4*g**3*i**3*(a**3*d**3 - 7*a**2*b*c*d**2 + 21*a*b**2*c**2*d - 35*b**3*c**
3)/b - 70*B*a**4*b**3*c**4*d**3*g**3*i**3 - B*a**4*c*d**3*g**3*i**3*(a**3*d
**3 - 7*a**2*b*c*d**2 + 21*a*b**2*c**2*d - 35*b**3*c**3) + 21*B*a**3*b**4*c
**5*d**2*g**3*i**3 - 7*B*a**2*b**5*c**6*d*g**3*i**3 + B*a*b**6*c**7*g**3*i
**3)/(B*a**7*d**7*g**3*i**3 - 7*B*a**6*b*c*d**6*g**3*i**3 + 21*B*a**5*b**2*c
**2*d**5*g**3*i**3 - 35*B*a**4*b**3*c**3*d**4*g**3*i**3 - 35*B*a**3*b**4*c
**4*d**3*g**3*i**3 + 21*B*a**2*b**5*c**5*d**2*g**3*i**3 - 7*B*a*b**6*c**6*d*
g**3*i**3 + B*b**7*c**7*g**3*i**3))/(140*b**4) - B*c**4*g**3*i**3*(35*a**3*
```

$$\begin{aligned}
& d^{**3} - 21*a^{**2}*b*c*d^{**2} + 7*a*b^{**2}*c^{**2}*d - b^{**3}*c^{**3})*\log(x + (B*a^{**7}*c*d^{**6}*g^{**3}*i^{**3} - 7*B*a^{**6}*b*c^{**2}*d^{**5}*g^{**3}*i^{**3} + 21*B*a^{**5}*b^{**2}*c^{**3}*d^{**4}*g^{**3}*i^{**3} - 70*B*a^{**4}*b^{**3}*c^{**4}*d^{**3}*g^{**3}*i^{**3} + 21*B*a^{**3}*b^{**4}*c^{**5}*d^{**2}*g^{**3}*i^{**3} - 7*B*a^{**2}*b^{**5}*c^{**6}*d*g^{**3}*i^{**3} + B*a*b^{**6}*c^{**7}*g^{**3}*i^{**3} + B*a*b^{**3}*c^{**4}*g^{**3}*i^{**3}*(35*a^{**3}*d^{**3} - 21*a^{**2}*b*c*d^{**2} + 7*a*b^{**2}*c^{**2}*d - b^{**3}*c^{**3}) - B*b^{**4}*c^{**5}*g^{**3}*i^{**3}*(35*a^{**3}*d^{**3} - 21*a^{**2}*b*c*d^{**2} + 7*a*b^{**2}*c^{**2}*d - b^{**3}*c^{**3})/d)/(B*a^{**7}*d^{**7}*g^{**3}*i^{**3} - 7*B*a^{**6}*b*c*d^{**6}*g^{**3}*i^{**3} + 21*B*a^{**5}*b^{**2}*c^{**2}*d^{**5}*g^{**3}*i^{**3} - 35*B*a^{**4}*b^{**3}*c^{**3}*d^{**4}*g^{**3}*i^{**3} - 35*B*a^{**3}*b^{**4}*c^{**4}*d^{**3}*g^{**3}*i^{**3} + 21*B*a^{**2}*b^{**5}*c^{**5}*d^{**2}*g^{**3}*i^{**3} - 7*B*a*b^{**6}*c^{**6}*d*g^{**3}*i^{**3} + B*b^{**7}*c^{**7}*g^{**3}*i^{**3}))/((140*d^{**4}) + x^{**6}*(A*a*b^{**2}*d^{**3}*g^{**3}*i^{**3}/2 + A*b^{**3}*c*d^{**2}*g^{**3}*i^{**3}/2 + B*a*b^{**2}*d^{**3}*g^{**3}*i^{**3}/42 - B*b^{**3}*c*d^{**2}*g^{**3}*i^{**3}/42) + x^{**5}*(3*A*a^{**2}*b*d^{**3}*g^{**3}*i^{**3}/5 + 9*A*a*b^{**2}*c*d^{**2}*g^{**3}*i^{**3}/5 + 3*A*b^{**3}*c^{**2}*d*g^{**3}*i^{**3}/5 + B*a^{**2}*b*d^{**3}*g^{**3}*i^{**3}/14 - B*b^{**3}*c^{**2}*d*g^{**3}*i^{**3}/14) + x^{**4}*(A*a^{**3}*d^{**3}*g^{**3}*i^{**3}/4 + 9*A*a^{**2}*b*c*d^{**2}*g^{**3}*i^{**3}/4 + 9*A*a*b^{**2}*c^{**2}*d*g^{**3}*i^{**3}/4 + A*b^{**3}*c^{**3}*g^{**3}*i^{**3}/4 + 17*B*a^{**3}*d^{**3}*g^{**3}*i^{**3}/280 + 7*B*a^{**2}*b*c*d^{**2}*g^{**3}*i^{**3}/40 - 7*B*a*b^{**2}*c^{**2}*d*g^{**3}*i^{**3}/40 - 17*B*b^{**3}*c^{**3}*g^{**3}*i^{**3}/280) + (B*a^{**3}*c^{**3}*g^{**3}*i^{**3}*x + 3*B*a^{**3}*c^{**2}*d*g^{**3}*i^{**3}*x^{**2}/2 + B*a^{**3}*c*d^{**2}*g^{**3}*i^{**3}*x^{**3} + B*a^{**3}*d^{**3}*g^{**3}*i^{**3}*x^{**4}/4 + 3*B*a^{**2}*b*c^{**3}*g^{**3}*i^{**3}*x^{**2}/2 + 3*B*a^{**2}*b*c^{**2}*d*g^{**3}*i^{**3}*x^{**3} + 9*B*a^{**2}*b*c*d^{**2}*g^{**3}*i^{**3}*x^{**4}/4 + 3*B*a^{**2}*b*d^{**3}*g^{**3}*i^{**3}*x^{**5}/5 + B*a*b^{**2}*c^{**3}*g^{**3}*i^{**3}*x^{**3} + 9*B*a*b^{**2}*c^{**2}*d*g^{**3}*i^{**3}*x^{**4}/4 + 9*B*a*b^{**2}*c*d^{**2}*g^{**3}*i^{**3}*x^{**5}/5 + B*a*b^{**2}*d^{**3}*g^{**3}*i^{**3}*x^{**6}/2 + B*b^{**3}*c^{**3}*g^{**3}*i^{**3}*x^{**4}/4 + 3*B*b^{**3}*c^{**2}*d*g^{**3}*i^{**3}*x^{**5}/5 + B*b^{**3}*c*d^{**2}*g^{**3}*i^{**3}*x^{**6}/2 + B*b^{**3}*d^{**3}*g^{**3}*i^{**3}*x^{**7}/7)*\log(e*(a + b*x)/(c + d*x)) + x^{**3}*(420*A*a^{**3}*b*c*d^{**3}*g^{**3}*i^{**3} + 1260*A*a^{**2}*b^{**2}*c^{**2}*d^{**2}*g^{**3}*i^{**3} + 420*A*a*b^{**3}*c^{**3}*d*g^{**3}*i^{**3} + B*a^{**4}*d^{**4}*g^{**3}*i^{**3} + 98*B*a^{**3}*b*c*d^{**3}*g^{**3}*i^{**3} - 98*B*a*b^{**3}*c^{**3}*d*g^{**3}*i^{**3} - B*b^{**4}*c^{**4}*g^{**3}*i^{**3})/(420*b*d) - x^{**2}*(-420*A*a^{**3}*b^{**2}*c^{**2}*d^{**3}*g^{**3}*i^{**3} - 420*A*a^{**2}*b^{**3}*c^{**3}*d^{**2}*g^{**3}*i^{**3} + B*a^{**5}*d^{**5}*g^{**3}*i^{**3} - 7*B*a^{**4}*b*c*d^{**4}*g^{**3}*i^{**3} - 84*B*a^{**3}*b^{**2}*c^{**2}*d^{**3}*g^{**3}*i^{**3} + 84*B*a^{**2}*b^{**3}*c^{**3}*d^{**2}*g^{**3}*i^{**3} + 7*B*a*b^{**4}*c^{**4}*d*g^{**3}*i^{**3} - B*b^{**5}*c^{**5}*g^{**3}*i^{**3}))/((280*b^{**2}*d^{**2}) + x*(140*A*a^{**3}*b^{**3}*c^{**3}*d^{**3}*g^{**3}*i^{**3} + B*a^{**6}*d^{**6}*g^{**3}*i^{**3} - 7*B*a^{**5}*b*c*d^{**5}*g^{**3}*i^{**3} + 21*B*a^{**4}*b^{**2}*c^{**2}*d^{**4}*g^{**3}*i^{**3} - 21*B*a^{**2}*b^{**4}*c^{**4}*d^{**2}*g^{**3}*i^{**3} + 7*B*a*b^{**5}*c^{**5}*d*g^{**3}*i^{**3} - B*b^{**6}*c^{**6}*g^{**3}*i^{**3}))/((140*b^{**3}*d^{**3}))
\end{aligned}$$

**Giac [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(d\*i\*x+c\*i)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c))),x, algor

```
ithm="giac")
```

```
[Out] Timed out
```

$$3.21 \quad \int (ag + bgx)^2 (ci + dix)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) dx$$

**Optimal.** Leaf size=371

$$\frac{b^2 g^2 i^3 (c + dx)^6 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{6d^3} + \frac{g^2 i^3 (c + dx)^4 (bc - ad)^2 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{4d^3} - \frac{2bg^2 i^3 (c + dx)^5 (bc - ad) \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{5d^3}$$

[Out]  $-(B*(b*c - a*d)^5*g^2*i^3*x)/(60*b^3*d^2) - (B*(b*c - a*d)^4*g^2*i^3*(c + d*x)^2)/(120*b^2*d^3) - (B*(b*c - a*d)^3*g^2*i^3*(c + d*x)^3)/(180*b*d^3) + (7*B*(b*c - a*d)^2*g^2*i^3*(c + d*x)^4)/(120*d^3) - (b*B*(b*c - a*d)*g^2*i^3*(c + d*x)^5)/(30*d^3) - (B*(b*c - a*d)^6*g^2*i^3*\text{Log}[(a + b*x)/(c + d*x)])/(60*b^4*d^3) + ((b*c - a*d)^2*g^2*i^3*(c + d*x)^4*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(4*d^3) - (2*b*(b*c - a*d)*g^2*i^3*(c + d*x)^5*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(5*d^3) + (b^2*g^2*i^3*(c + d*x)^6*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(6*d^3) - (B*(b*c - a*d)^6*g^2*i^3*\text{Log}[c + d*x])/(60*b^4*d^3)$

**Rubi [A]** time = 0.674729, antiderivative size = 330, normalized size of antiderivative = 0.89, number of steps used = 14, number of rules used = 4, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.1$ , Rules used = {2528, 2525, 12, 43}

$$\frac{b^2 g^2 i^3 (c + dx)^6 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{6d^3} + \frac{g^2 i^3 (c + dx)^4 (bc - ad)^2 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{4d^3} - \frac{2bg^2 i^3 (c + dx)^5 (bc - ad) \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{5d^3}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[(a*g + b*g*x)^2*(c*i + d*i*x)^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]), x]$

[Out]  $-(B*(b*c - a*d)^5*g^2*i^3*x)/(60*b^3*d^2) - (B*(b*c - a*d)^4*g^2*i^3*(c + d*x)^2)/(120*b^2*d^3) - (B*(b*c - a*d)^3*g^2*i^3*(c + d*x)^3)/(180*b*d^3) + (7*B*(b*c - a*d)^2*g^2*i^3*(c + d*x)^4)/(120*d^3) - (b*B*(b*c - a*d)*g^2*i^3*(c + d*x)^5)/(30*d^3) - (B*(b*c - a*d)^6*g^2*i^3*\text{Log}[a + b*x])/(60*b^4*d^3) + ((b*c - a*d)^2*g^2*i^3*(c + d*x)^4*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(4*d^3) - (2*b*(b*c - a*d)*g^2*i^3*(c + d*x)^5*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(5*d^3) + (b^2*g^2*i^3*(c + d*x)^6*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(6*d^3)$

### Rule 2528

$\text{Int}[(a_. + \text{Log}[(c_.)*(RfX_)^(p_.)]*(b_.))^(n_.)*(RgX_), x\_Symbol] \rightarrow \text{With}[\{u = \text{ExpandIntegrand}[(a + b*\text{Log}[c*RfX^p])^n, RgX, x]\}, \text{Int}[u, x] /; \text{SumQ}[u$

```
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && LeQ[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

### Rubi steps

$$\begin{aligned}
\int (21c + 21dx)^3 (ag + bgx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) dx &= \int \left( \frac{(-bc + ad)^2 g^2 (21c + 21dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{d^2} - \frac{2b(bc - ad)^2 g^2 (21c + 21dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{d^2} \right) dx \\
&= \frac{(b^2 g^2) \int (21c + 21dx)^5 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) dx}{441 d^2} - \frac{(2b(bc - ad)^2 g^2) \int (21c + 21dx)^5 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) dx}{441 d^2} \\
&= \frac{9261(bc - ad)^2 g^2 (c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{4d^3} - \frac{18522b(bc - ad)^2 g^2 (c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{4d^3} \\
&= \frac{9261(bc - ad)^2 g^2 (c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{4d^3} - \frac{18522b(bc - ad)^2 g^2 (c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{4d^3} \\
&= \frac{9261(bc - ad)^2 g^2 (c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{4d^3} - \frac{18522b(bc - ad)^2 g^2 (c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{4d^3} \\
&= -\frac{3087B(bc - ad)^5 g^2 x}{20b^3 d^2} - \frac{3087B(bc - ad)^4 g^2 (c + dx)^2}{40b^2 d^3} - \frac{1029}{40b^2 d^3}
\end{aligned}$$

**Mathematica [A]** time = 0.320609, size = 429, normalized size = 1.16

$$\frac{g^2 i^3 \left( 60b^6 (c + dx)^6 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right) - 144b^5 (c + dx)^5 (bc - ad) \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right) + 90b^4 (c + dx)^4 (bc - ad)^2 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right) - 60b^3 (c + dx)^3 (bc - ad)^3 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right) + 30b^2 (c + dx)^2 (bc - ad)^4 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right) - 6b (c + dx) (bc - ad)^5 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right) + (bc - ad)^6 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right) \right)}{(c + dx)^6}$$

Antiderivative was successfully verified.

[In] Integrate[(a\*g + b\*g\*x)^2\*(c\*i + d\*i\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])/x]

[Out] (g^2\*i^3\*(-15\*B\*(b\*c - a\*d)^3\*(6\*b\*d\*(b\*c - a\*d)^2\*x + 3\*b^2\*(b\*c - a\*d)\*(c + d\*x)^2 + 2\*b^3\*(c + d\*x)^3 + 6\*(b\*c - a\*d)^3\*Log[a + b\*x]) + 12\*B\*(b\*c - a\*d)^2\*(12\*b\*d\*(b\*c - a\*d)^3\*x + 6\*b^2\*(b\*c - a\*d)^2\*(c + d\*x)^2 + 4\*b^3\*(b\*c - a\*d)\*(c + d\*x)^3 + 3\*b^4\*(c + d\*x)^4 + 12\*(b\*c - a\*d)^4\*Log[a + b\*x]) - B\*(b\*c - a\*d)\*(60\*b\*d\*(b\*c - a\*d)^4\*x + 30\*b^2\*(b\*c - a\*d)^3\*(c + d\*x)^2 + 20\*b^3\*(b\*c - a\*d)^2\*(c + d\*x)^3 + 15\*b^4\*(b\*c - a\*d)\*(c + d\*x)^4 + 12\*b^5\*(c + d\*x)^5 + 60\*(b\*c - a\*d)^5\*Log[a + b\*x]) + 90\*b^4\*(b\*c - a\*d)^2\*(c + d\*x)^4\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) - 144\*b^5\*(b\*c - a\*d)\*(c + d\*x)^5\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) + 60\*b^6\*(c + d\*x)^6\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])))/(360\*b^4\*d^3)

**Maple [B]** time = 0.211, size = 7597, normalized size = 20.5

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In]  $\text{int}((b*gx+a*g)^2*(d*i*x+c*i)^3*(A+B*\ln(e*(b*x+a)/(d*x+c))),x)$

[Out] result too large to display

**Maxima [B]** time = 1.49185, size = 2415, normalized size = 6.51

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In]  $\text{integrate}((b*gx+a*g)^2*(d*i*x+c*i)^3*(A+B*\log(e*(b*x+a)/(d*x+c))),x, \text{algor}$   
 $\text{ithm}=\text{"maxima"})$

[Out]  $\frac{1}{6}A*b^2*d^3*g^2*i^3*x^6 + \frac{3}{5}A*b^2*c*d^2*g^2*i^3*x^5 + \frac{2}{5}A*a*b*d^3*g^2$   
 $i^3*x^5 + \frac{3}{4}A*b^2*c^2*d*g^2*i^3*x^4 + \frac{3}{2}A*a*b*c*d^2*g^2*i^3*x^4 + \frac{1}{4}$   
 $A*a^2*d^3*g^2*i^3*x^4 + \frac{1}{3}A*b^2*c^3*g^2*i^3*x^3 + 2A*a*b*c^2*d*g^2*i^3*x$   
 $^3 + A*a^2*c*d^2*g^2*i^3*x^3 + A*a*b*c^3*g^2*i^3*x^2 + \frac{3}{2}A*a^2*c^2*d*g^2$   
 $i^3*x^2 + (x*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) + a*\log(b*x + a)/b - c*\log$   
 $(d*x + c)/d)*B*a^2*c^3*g^2*i^3 + (x^2*\log(b*e*x/(d*x + c) + a*e/(d*x + c))$   
 $- a^2*\log(b*x + a)/b^2 + c^2*\log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*B*a*b$   
 $*c^3*g^2*i^3 + \frac{1}{6}(2*x^3*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*\log$   
 $(b*x + a)/b^3 - 2*c^3*\log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c$   
 $^2 - a^2*d^2)*x)/(b^2*d^2))*B*b^2*c^3*g^2*i^3 + \frac{3}{2}(x^2*\log(b*e*x/(d*x + c)$   
 $) + a*e/(d*x + c)) - a^2*\log(b*x + a)/b^2 + c^2*\log(d*x + c)/d^2 - (b*c - a$   
 $*d)*x/(b*d))*B*a^2*c^2*d*g^2*i^3 + (2*x^3*\log(b*e*x/(d*x + c) + a*e/(d*x +$   
 $c)) + 2*a^3*\log(b*x + a)/b^3 - 2*c^3*\log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2$   
 $)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*a*b*c^2*d*g^2*i^3 + \frac{1}{8}(6*x^$   
 $4*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*\log(b*x + a)/b^4 + 6*c^4*\log$   
 $(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*$   
 $x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*b^2*c^2*d*g^2*i^3 + \frac{1}{2}(2*x^3*$   
 $\log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*\log(b*x + a)/b^3 - 2*c^3*\log(d$   
 $*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)$   
 $)*B*a^2*c*d^2*g^2*i^3 + \frac{1}{4}(6*x^4*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6$   
 $a^4*\log(b*x + a)/b^4 + 6*c^4*\log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)$   
 $*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*$   
 $B*a*b*c*d^2*g^2*i^3 + \frac{1}{20}(12*x^5*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 1$



$$\begin{aligned}
& 2*a^5*\log(b*x + a)/b^5 - 12*c^5*\log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 \\
& - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*B*b^2*c*d^2*g^2*i^3 + 1/24*(6*x^4*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*\log(b*x + a)/b^4 + 6*c^4*\log(d*x \\
& + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*a^2*d^3*g^2*i^3 + 1/30*(12*x^5*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 12*a^5*\log(b*x + a)/b^5 - 12*c^5*\log(d*x \\
& + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*B*a*b*d^3*g^2*i^3 + 1/360*(60*x^6*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 60 \\
& *a^6*\log(b*x + a)/b^6 + 60*c^6*\log(d*x + c)/d^6 - (12*(b^5*c*d^4 - a*b^4*d^5)*x^5 - 15*(b^5*c^2*d^3 - a^2*b^3*d^5)*x^4 + 20*(b^5*c^3*d^2 - a^3*b^2*d^5)*x^3 - 30*(b^5*c^4*d - a^4*b*d^5)*x^2 + 60*(b^5*c^5 - a^5*d^5)*x)/(b^5*d^5 \\
& ))*B*b^2*d^3*g^2*i^3 + A*a^2*c^3*g^2*i^3*x
\end{aligned}$$

**Fricas [B]** time = 1.50269, size = 1509, normalized size = 4.07

$$60 Ab^6 d^6 g^2 i^3 x^6 + 12 ((18 A - B) b^6 c d^5 + (12 A + B) a b^5 d^6) g^2 i^3 x^5 + 3 ((90 A - 13 B) b^6 c^2 d^4 + 6 (30 A + B) a b^5 c d^5 + (30 A$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c))),x, algorithm="fricas")

[Out] 1/360\*(60\*A\*b^6\*d^6\*g^2\*i^3\*x^6 + 12\*((18\*A - B)\*b^6\*c\*d^5 + (12\*A + B)\*a\*b^5\*d^6)\*g^2\*i^3\*x^5 + 3\*((90\*A - 13\*B)\*b^6\*c^2\*d^4 + 6\*(30\*A + B)\*a\*b^5\*c\*d^5 + (30\*A + 7\*B)\*a^2\*b^4\*d^6)\*g^2\*i^3\*x^4 + 2\*((60\*A - 19\*B)\*b^6\*c^3\*d^3 + 3\*(120\*A - 7\*B)\*a\*b^5\*c^2\*d^4 + 3\*(60\*A + 13\*B)\*a^2\*b^4\*c\*d^5 + B\*a^3\*b^3\*d^6)\*g^2\*i^3\*x^3 - 3\*(B\*b^6\*c^4\*d^2 - 2\*(60\*A - 17\*B)\*a\*b^5\*c^3\*d^3 - 30\*(6\*A + B)\*a^2\*b^4\*c^2\*d^4 - 6\*B\*a^3\*b^3\*c\*d^5 + B\*a^4\*b^2\*d^6)\*g^2\*i^3\*x^2 + 6\*(B\*b^6\*c^5\*d - 6\*B\*a\*b^5\*c^4\*d^2 + 5\*(12\*A - B)\*a^2\*b^4\*c^3\*d^3 + 15\*B\*a^3\*b^3\*c^2\*d^4 - 6\*B\*a^4\*b^2\*c\*d^5 + B\*a^5\*b\*d^6)\*g^2\*i^3\*x + 6\*(20\*B\*a^3\*b^3\*c^3\*d^3 - 15\*B\*a^4\*b^2\*c^2\*d^4 + 6\*B\*a^5\*b\*c\*d^5 - B\*a^6\*d^6)\*g^2\*i^3\*log(b\*x + a) - 6\*(B\*b^6\*c^6 - 6\*B\*a\*b^5\*c^5\*d + 15\*B\*a^2\*b^4\*c^4\*d^2)\*g^2\*i^3\*log(d\*x + c) + 6\*(10\*B\*b^6\*d^6\*g^2\*i^3\*x^6 + 60\*B\*a^2\*b^4\*c^3\*d^3\*g^2\*i^3\*x^5 + 12\*(3\*B\*b^6\*c\*d^5 + 2\*B\*a\*b^5\*d^6)\*g^2\*i^3\*x^4 + 15\*(3\*B\*b^6\*c^2\*d^4 + 6\*B\*a\*b^5\*c\*d^5 + B\*a^2\*b^4\*d^6)\*g^2\*i^3\*x^3 + 20\*(B\*b^6\*c^3\*d^3 + 6\*B\*a\*b^5\*c^2\*d^4 + 3\*B\*a^2\*b^4\*c\*d^5)\*g^2\*i^3\*x^2 + 30\*(2\*B\*a\*b^5\*c^3\*d^3 + 3\*B\*a^2\*b^4\*c^2\*d^4)\*g^2\*i^3\*x^2)\*log((b\*e\*x + a\*e)/(d\*x + c))/(b^4\*d^3)

**Sympy [B]** time = 13.9354, size = 1761, normalized size = 4.75

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*\*2\*(d\*i\*x+c\*i)\*\*3\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c))),x)

[Out] 
$$A*b^{**2}*d^{**3}*g^{**2}*i^{**3}*x^{**6}/6 - B*a^{**3}*g^{**2}*i^{**3}*(a^{**3}*d^{**3} - 6*a^{**2}*b*c*d^{**2} + 15*a*b^{**2}*c^{**2}*d - 20*b^{**3}*c^{**3})*\log(x + (B*a^{**6}*c*d^{**5}*g^{**2}*i^{**3} - 6*B*a^{**5}*b*c^{**2}*d^{**4}*g^{**2}*i^{**3} + 15*B*a^{**4}*b^{**2}*c^{**3}*d^{**3}*g^{**2}*i^{**3} + B*a^{**4}*d^{**3}*g^{**2}*i^{**3}*(a^{**3}*d^{**3} - 6*a^{**2}*b*c*d^{**2} + 15*a*b^{**2}*c^{**2}*d - 20*b^{**3}*c^{**3}))/b - 35*B*a^{**3}*b^{**3}*c^{**4}*d^{**2}*g^{**2}*i^{**3} - B*a^{**3}*c*d^{**2}*g^{**2}*i^{**3}*(a^{**3}*d^{**3} - 6*a^{**2}*b*c*d^{**2} + 15*a*b^{**2}*c^{**2}*d - 20*b^{**3}*c^{**3}) + 6*B*a^{**2}*b^{**4}*c^{**5}*d*g^{**2}*i^{**3} - B*a*b^{**5}*c^{**6}*g^{**2}*i^{**3})/(B*a^{**6}*d^{**6}*g^{**2}*i^{**3} - 6*B*a^{**5}*b*c*d^{**5}*g^{**2}*i^{**3} + 15*B*a^{**4}*b^{**2}*c^{**2}*d^{**4}*g^{**2}*i^{**3} - 20*B*a^{**3}*b^{**3}*c^{**3}*d^{**3}*g^{**2}*i^{**3} - 15*B*a^{**2}*b^{**4}*c^{**4}*d^{**2}*g^{**2}*i^{**3} + 6*B*a*b^{**5}*c^{**5}*d*g^{**2}*i^{**3} - B*b^{**6}*c^{**6}*g^{**2}*i^{**3}))/ (60*b^{**4}) - B*c^{**4}*g^{**2}*i^{**3}*(15*a^{**2}*d^{**2} - 6*a*b*c*d + b^{**2}*c^{**2})*\log(x + (B*a^{**6}*c*d^{**5}*g^{**2}*i^{**3} - 6*B*a^{**5}*b*c^{**2}*d^{**4}*g^{**2}*i^{**3} + 15*B*a^{**4}*b^{**2}*c^{**3}*d^{**3}*g^{**2}*i^{**3} - 35*B*a^{**3}*b^{**3}*c^{**4}*d^{**2}*g^{**2}*i^{**3} + 6*B*a^{**2}*b^{**4}*c^{**5}*d*g^{**2}*i^{**3} - B*a*b^{**5}*c^{**6}*g^{**2}*i^{**3} + B*a*b^{**3}*c^{**4}*g^{**2}*i^{**3}*(15*a^{**2}*d^{**2} - 6*a*b*c*d + b^{**2}*c^{**2}) - B*b^{**4}*c^{**5}*g^{**2}*i^{**3}*(15*a^{**2}*d^{**2} - 6*a*b*c*d + b^{**2}*c^{**2}))/d)/(B*a^{**6}*d^{**6}*g^{**2}*i^{**3} - 6*B*a^{**5}*b*c*d^{**5}*g^{**2}*i^{**3} + 15*B*a^{**4}*b^{**2}*c^{**2}*d^{**4}*g^{**2}*i^{**3} - 20*B*a^{**3}*b^{**3}*c^{**3}*d^{**3}*g^{**2}*i^{**3} - 15*B*a^{**2}*b^{**4}*c^{**4}*d^{**2}*g^{**2}*i^{**3} + 6*B*a*b^{**5}*c^{**5}*d*g^{**2}*i^{**3} - B*b^{**6}*c^{**6}*g^{**2}*i^{**3}))/ (60*d^{**3}) + x^{**5}*(2*A*a*b*d^{**3}*g^{**2}*i^{**3}/5 + 3*A*b^{**2}*c*d^{**2}*g^{**2}*i^{**3}/5 + B*a*b*d^{**3}*g^{**2}*i^{**3}/30 - B*b^{**2}*c*d^{**2}*g^{**2}*i^{**3}/30) + x^{**4}*(A*a^{**2}*d^{**3}*g^{**2}*i^{**3}/4 + 3*A*a*b*c*d^{**2}*g^{**2}*i^{**3}/2 + 3*A*b^{**2}*c^{**2}*d*g^{**2}*i^{**3}/4 + 7*B*a^{**2}*d^{**3}*g^{**2}*i^{**3}/120 + B*a*b*c*d^{**2}*g^{**2}*i^{**3}/20 - 13*B*b^{**2}*c^{**2}*d*g^{**2}*i^{**3}/120) + (B*a^{**2}*c^{**3}*g^{**2}*i^{**3}*x + 3*B*a^{**2}*c^{**2}*d*g^{**2}*i^{**3}*x^{**2}/2 + B*a^{**2}*c*d^{**2}*g^{**2}*i^{**3}*x^{**3} + B*a^{**2}*d^{**3}*g^{**2}*i^{**3}*x^{**4}/4 + B*a*b*c^{**3}*g^{**2}*i^{**3}*x^{**2} + 2*B*a*b*c^{**2}*d*g^{**2}*i^{**3}*x^{**3} + 3*B*a*b*c*d^{**2}*g^{**2}*i^{**3}*x^{**4}/2 + 2*B*a*b*d^{**3}*g^{**2}*i^{**3}*x^{**5}/5 + B*b^{**2}*c^{**3}*g^{**2}*i^{**3}*x^{**3}/3 + 3*B*b^{**2}*c^{**2}*d*g^{**2}*i^{**3}*x^{**4}/4 + 3*B*b^{**2}*c*d^{**2}*g^{**2}*i^{**3}*x^{**5}/5 + B*b^{**2}*d^{**3}*g^{**2}*i^{**3}*x^{**6}/6)*\log(e*(a + b*x)/(c + d*x)) + x^{**3}*(180*A*a^{**2}*b*c*d^{**2}*g^{**2}*i^{**3} + 360*A*a*b^{**2}*c^{**2}*d*g^{**2}*i^{**3} + 60*A*b^{**3}*c^{**3}*g^{**2}*i^{**3} + B*a^{**3}*d^{**3}*g^{**2}*i^{**3} + 39*B*a^{**2}*b*c*d^{**2}*g^{**2}*i^{**3} - 21*B*a*b^{**2}*c^{**2}*d*g^{**2}*i^{**3} - 19*B*b^{**3}*c^{**3}*g^{**2}*i^{**3}))/ (180*b) - x^{**2}*(-180*A*a^{**2}*b^{**2}*c^{**2}*d^{**2}*g^{**2}*i^{**3} - 120*A*a*b^{**3}*c^{**3}*d*g^{**2}*i^{**3} + B*a^{**4}*d^{**4}*g^{**2}*i^{**3} - 6*B*a^{**3}*b*c*d^{**3}*g^{**2}*i^{**3} - 30*B*a^{**2}*b^{**2}*c^{**2}*d^{**2}*g^{**2}*i^{**3} + 34*B*a*b^{**3}*c^{**3}*d*g^{**2}*i^{**3} + B*b^{**4}*c^{**4}*g^{**2}*i^{**3}))/ (120*b^{**2}*d) + x*(60*A*a^{**2}*b^{**3}*c^{**3}*d^{**2}*g^{**2}*i^{**3} + B*a^{**5}*d^{**5}*g^{**2}*i^{**3} - 6*B*a^{**4}*b*c*d^{**4}*g^{**2}*i^{**3} + 15*B*a^{**3}*b^{**2}*c^{**2}*d^{**3}*g^{**2}*i^{**3} - 5*B*a^{**2}*b^{**3}*c^{**3}*d^{**2}*g^{**2}*i^{**3} - 6*B*a*b^{**4}*c^{**4}*d*g^{**2}$$

$$i^{**3} + B*b^{**5}*c^{**5}*g^{**2}*i^{**3})/(60*b^{**3}*d^{**2})$$

---

**Giac [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorith="giac")
```

```
[Out] Timed out
```

### 3.22 $\int (ag + bgx)(ci + dix)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) dx$

**Optimal.** Leaf size=271

$$-\frac{gi^3(c+dx)^4(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4d^2} + \frac{bgi^3(c+dx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{5d^2} + \frac{Bgi^3(c+dx)^2(bc-ad)^3}{40b^2d^2} + \frac{Bgi^3(bc-ad)^3}{40b^2d^2}$$

[Out] (B\*(b\*c - a\*d)^4\*g\*i^3\*x)/(20\*b^3\*d) + (B\*(b\*c - a\*d)^3\*g\*i^3\*(c + d\*x)^2)/(40\*b^2\*d^2) + (B\*(b\*c - a\*d)^2\*g\*i^3\*(c + d\*x)^3)/(60\*b\*d^2) - (B\*(b\*c - a\*d)\*g\*i^3\*(c + d\*x)^4)/(20\*d^2) + (B\*(b\*c - a\*d)^5\*g\*i^3\*Log[(a + b\*x)/(c + d\*x)])/(20\*b^4\*d^2) - ((b\*c - a\*d)\*g\*i^3\*(c + d\*x)^4\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(4\*d^2) + (b\*g\*i^3\*(c + d\*x)^5\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(5\*d^2) + (B\*(b\*c - a\*d)^5\*g\*i^3\*Log[c + d\*x])/(20\*b^4\*d^2)

**Rubi [A]** time = 0.340664, antiderivative size = 232, normalized size of antiderivative = 0.86, number of steps used = 10, number of rules used = 4, integrand size = 38,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.105$ , Rules used = {2528, 2525, 12, 43}

$$-\frac{gi^3(c+dx)^4(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4d^2} + \frac{bgi^3(c+dx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{5d^2} + \frac{Bgi^3(c+dx)^2(bc-ad)^3}{40b^2d^2} + \frac{Bgi^3(bc-ad)^3}{40b^2d^2}$$

Antiderivative was successfully verified.

[In] Int[(a\*g + b\*g\*x)\*(c\*i + d\*i\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]),x]

[Out] (B\*(b\*c - a\*d)^4\*g\*i^3\*x)/(20\*b^3\*d) + (B\*(b\*c - a\*d)^3\*g\*i^3\*(c + d\*x)^2)/(40\*b^2\*d^2) + (B\*(b\*c - a\*d)^2\*g\*i^3\*(c + d\*x)^3)/(60\*b\*d^2) - (B\*(b\*c - a\*d)\*g\*i^3\*(c + d\*x)^4)/(20\*d^2) + (B\*(b\*c - a\*d)^5\*g\*i^3\*Log[a + b\*x])/(20\*b^4\*d^2) - ((b\*c - a\*d)\*g\*i^3\*(c + d\*x)^4\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(4\*d^2) + (b\*g\*i^3\*(c + d\*x)^5\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(5\*d^2)

#### Rule 2528

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*(RGx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

#### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_) /; FreeQ[b, x]]
```

### Rule 43

```
Int[((a_.) + (b_.)*(x_.))^(m_.)*((c_.) + (d_.)*(x_.))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && LeQ[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

### Rubi steps

$$\begin{aligned}
 \int (22c + 22dx)^3 (ag + bgx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) dx &= \int \left( \frac{(-bc + ad)g(22c + 22dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{d} + \frac{bg(22c + 22dx)^3}{d} \right) dx \\
 &= \frac{(bg) \int (22c + 22dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) dx}{22d} + \frac{((-bc + ad)g) \int (22c + 22dx)^3 dx}{22d} \\
 &= -\frac{2662(bc - ad)g(c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{d^2} + \frac{10648bg(c + dx)^3}{d} \\
 &= -\frac{2662(bc - ad)g(c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{d^2} + \frac{10648bg(c + dx)^3}{d} \\
 &= -\frac{2662(bc - ad)g(c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{d^2} + \frac{10648bg(c + dx)^3}{d} \\
 &= \frac{2662B(bc - ad)^4 gx}{5b^3 d} + \frac{1331B(bc - ad)^3 g(c + dx)^2}{5b^2 d^2} + \frac{2662B(bc - ad)^2 g(c + dx)}{5b d^3} + \frac{10648bg(c + dx)^3}{d}
 \end{aligned}$$

**Mathematica [A]** time = 0.192793, size = 261, normalized size = 0.96

$$\frac{gi^3 \left( 24b(c+dx)^5 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right) - 30(c+dx)^4(bc-ad) \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right) + \frac{5B(bc-ad)^2(3b^2(c+dx)^2(bc-ad)+6bdx(bc-ad)^2)}{b^4} \right)}{120d^2}$$

Antiderivative was successfully verified.

[In] Integrate[(a\*g + b\*g\*x)\*(c\*i + d\*i\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]), x]

[Out] (g\*i^3\*((5\*B\*(b\*c - a\*d)^2\*(6\*b\*d\*(b\*c - a\*d)^2\*x + 3\*b^2\*(b\*c - a\*d)\*(c + d\*x)^2 + 2\*b^3\*(c + d\*x)^3 + 6\*(b\*c - a\*d)^3\*Log[a + b\*x]))/b^4 - (2\*B\*(b\*c - a\*d)\*(12\*b\*d\*(b\*c - a\*d)^3\*x + 6\*b^2\*(b\*c - a\*d)^2\*(c + d\*x)^2 + 4\*b^3\*(b\*c - a\*d)\*(c + d\*x)^3 + 3\*b^4\*(c + d\*x)^4 + 12\*(b\*c - a\*d)^4\*Log[a + b\*x])/b^4 - 30\*(b\*c - a\*d)\*(c + d\*x)^4\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])) + 24\*b\*(c + d\*x)^5\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]])))/(120\*d^2)

**Maple [B]** time = 0.191, size = 4481, normalized size = 16.5

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)^3\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c))), x)

[Out]  $-1/4*e^2*d*B*g*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3*c^2-1/20*e/d^2*B*g*i^3*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^5-1/12*e^3*d^2*B*g*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^4*c-1/60*e^3/d^2*B*g*i^3*b^4/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^5+1/40*e^2/d^2*B*g*i^3*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^5-1/20*e^4/d^2*B*g*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*b^5*c^5+1/20*e*d^3*B*g*i^3/b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^5-1/5*e^5/d^2*A*g*i^3*b^6/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^5*c^5-1/40*e^2*d^3*B*g*i^3/b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^5+1/5*e^5*d^3*A*g*i^3*b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^5*a^5+1/60*e^3*d^3*B*g*i^3/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^5+1/4*e^2*B*g*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2*c^3*b-2*e^5*A*g*i^3*b^4/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^5*a^2*c^3-1/2*e^4*B*g*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^2*b^3*c^3-5/2*e^4*A*g*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^2*b^3*c^3-1/6*e^3*B*g*i^3*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^2*c^3-1/4*e^4/d^2*A*g*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*b^5*c^5+1/4*e^4*d^3*B*g*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^5-1/4*d^2*B*g*i^3/b^3*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^4*c+1/2*d*B*g*i^3/b^2*ln(d*(b*e/d+(a*d-b$

$$\begin{aligned}
& c) * e/d/(d*x+c) - b * e) * a^3 * c^2 - 1/2 * e * B * g * i^3 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c) * a^2 * c^3 - e^5 * d^2 * B * g * i^3 * b^2 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^5 * a^4 * c + 1/5 * e^5 * d^8 * B * g * i^3 / b^4 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^5 * a^10 / (d * x + c)^5 + 5/4 * e^4 / d * B * g * i^3 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^4 * c^4 * b^4 * a - 5/4 * e^4 * d^2 * B * g * i^3 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^4 * a^4 * b * c - 1/4 * e^4 * d^7 * B * g * i^3 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / b^4 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^4 * a^9 / (d * x + c)^4 + 5/2 * e^4 * d * B * g * i^3 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) * b^2 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^4 * a^3 * c^2 + 2 * e^5 * d * B * g * i^3 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^5 * a^3 * b^3 * c^2 + 42 * e^5 * d^4 * B * g * i^3 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^5 * c^4 / (d * x + c)^5 * a^6 - 1/20 / d^2 * B * g * i^3 * \ln(d * (b * e / d + (a * d - b * c) * e / d / (d * x + c)) - b * e) * c^5 * b + 1/20 * d^3 * B * g * i^3 / b^4 * \ln(d * (b * e / d + (a * d - b * c) * e / d / (d * x + c)) - b * e) * a^5 - 1/2 * B * g * i^3 / b * \ln(d * (b * e / d + (a * d - b * c) * e / d / (d * x + c)) - b * e) * a^2 * c^3 + 1/20 * e^4 * d^3 * B * g * i^3 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^4 * a^5 + 1/4 * e^4 * d^3 * A * g * i^3 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^4 * a^5 + 1/4 / d * B * g * i^3 * \ln(d * (b * e / d + (a * d - b * c) * e / d / (d * x + c)) - b * e) * c^4 * a + 1/4 * e^4 / d^2 * B * g * i^3 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^4 * c^9 / (d * x + c)^4 * b^5 - 63/2 * e^4 * d^3 * B * g * i^3 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^4 * a^5 * c^4 / (d * x + c)^4 + 1/5 * e^5 / d^2 * B * g * i^3 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^5 * c^10 / (d * x + c)^5 * b^6 + 9 * e^5 * B * g * i^3 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^5 * c^8 / (d * x + c)^5 * a^2 * b^4 + 9 * e^4 * B * g * i^3 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) * b^3 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^4 * a^2 * c^7 / (d * x + c)^4 + e^5 / d * B * g * i^3 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^5 * c^4 * b^5 * a - 2 * e^5 * d^7 * B * g * i^3 / b^3 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^5 * a^9 / (d * x + c)^5 * c + 9/4 * e^4 * d^6 * B * g * i^3 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / b^3 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^4 * a^8 / (d * x + c)^4 * c - 252/5 * e^5 * d^3 * B * g * i^3 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^5 * c^5 / (d * x + c)^5 * a^5 * b + 42 * e^5 * d^2 * B * g * i^3 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^5 * c^6 / (d * x + c)^5 * a^4 * b^2 - 24 * e^5 * d * B * g * i^3 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^5 * c^7 / (d * x + c)^5 * a^3 * b^3 - 9/4 * e^4 / d * B * g * i^3 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^4 * c^8 / (d * x + c)^4 * b^4 * a - 2 * e^5 / d * B * g * i^3 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^5 * c^9 / (d * x + c)^5 * b^5 * a + 9 * e^5 * d^6 * B * g * i^3 / b^2 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^5 * a^8 * c^2 / (d * x + c)^5 - 24 * e^5 * d^5 * B * g * i^3 / b * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^5 * a^7 * c^3 / (d * x + c)^5 - 9 * e^4 * d^5 * B * g * i^3 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / b^2 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^4 * a^7 * c^2 / (d * x + c)^4 + 21 * e^4 * d^4 * B * g * i^3 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / b / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^4 * a^6 * c^3 / (d * x + c)^4 - 21 * e^4 * d * B * g * i^3 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) * b^2 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^4 * a^3 * c^6 / (d * x + c)^4 + 63/2 * e^4 * d^2 * B * g * i^3 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^4 * a^4 * c^5 / (d * x + c)^4 * b + 1/2 * e * d * B * g * i^3 / b / (d * e / (d * x + c) * a - e / (d * x + c) * b * c) * a^3 * c^2 + 1/4 * e / d * B * g * i^3 * b / (d * e / (d * x + c) * a - e / (d * x + c) * b * c) * c^4 * a - 1/4 * e^4 * d^2 * B * g * i^3 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^4 * a^4 * b * c - 5/4 * e^4 * d^2 * A * g * i^3 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^4 * a^4
\end{aligned}$$

```

*b*c+1/12*e^3/d*B*g*i^3*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^4*a-1/8*e^2/d
*B*g*i^3*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^4*a+1/4*e^4/d*B*g*i^3/(d*e/(
d*x+c)*a-e/(d*x+c)*b*c)^4*b^4*c^4*a-1/4*e^4/d^2*B*g*i^3*ln(b*e/d+(a*d-b*c)*
e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*c^5*b^5-1/5*e^5/d^2*B*g*i^3*ln
(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^5*c^5*b^6-5/2*e
^4*B*g*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c
)^4*a^2*c^3-2*e^5*B*g*i^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/
(d*x+c)*b*c)^5*a^2*b^4*c^3+1/5*e^5*d^3*B*g*i^3*b*ln(b*e/d+(a*d-b*c)*e/d/(d*
x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^5*a^5+1/8*e^2*d^2*B*g*i^3/b/(d*e/(d*x+c
)*a-e/(d*x+c)*b*c)^2*a^4*c+1/6*e^3*d*B*g*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^
3*a^3*c^2*b+2*e^5*d*A*g*i^3*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^5*a^3*c^2+1/2
*e^4*d*B*g*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^3*b^2*c^2+5/2*e^4*d*A*g*i^
3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^3*b^2*c^2-e^5*d^2*A*g*i^3*b^2/(d*e/(d*x
+c)*a-e/(d*x+c)*b*c)^5*a^4*c+e^5/d*A*g*i^3*b^5/(d*e/(d*x+c)*a-e/(d*x+c)*b*c
)^5*c^4*a+5/4*e^4/d*A*g*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*b^4*c^4*a-1/4*e
*d^2*B*g*i^3/b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^4*c

```

**Maxima [B]** time = 1.36154, size = 1380, normalized size = 5.09

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```

[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorit
hm="maxima")

```

```

[Out] 1/5*A*b*d^3*g*i^3*x^5 + 3/4*A*b*c*d^2*g*i^3*x^4 + 1/4*A*a*d^3*g*i^3*x^4 + A
*b*c^2*d*g*i^3*x^3 + A*a*c*d^2*g*i^3*x^3 + 1/2*A*b*c^3*g*i^3*x^2 + 3/2*A*a*
c^2*d*g*i^3*x^2 + (x*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/
b - c*log(d*x + c)/d)*B*a*c^3*g*i^3 + 1/2*(x^2*log(b*e*x/(d*x + c) + a*e/(d
*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d
))*B*b*c^3*g*i^3 + 3/2*(x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*log(
b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*B*a*c^2*d*g*i^3
+ 1/2*(2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3
- 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)
*x)/(b^2*d^2))*B*b*c^2*d*g*i^3 + 1/2*(2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x
+ c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d
^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*a*c*d^2*g*i^3 + 1/8*(6*x^4*
log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d
*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^
2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*b*c*d^2*g*i^3 + 1/24*(6*x^4*log(b
e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x +

```



c)/d<sup>4</sup> - (2\*(b<sup>3</sup>\*c\*d<sup>2</sup> - a\*b<sup>2</sup>\*d<sup>3</sup>)\*x<sup>3</sup> - 3\*(b<sup>3</sup>\*c<sup>2</sup>\*d - a<sup>2</sup>\*b\*d<sup>3</sup>)\*x<sup>2</sup> + 6\*(b<sup>3</sup>\*c<sup>3</sup> - a<sup>3</sup>\*d<sup>3</sup>)\*x)/(b<sup>3</sup>\*d<sup>3</sup>))\*B\*a\*d<sup>3</sup>\*g\*i<sup>3</sup> + 1/60\*(12\*x<sup>5</sup>\*log(b\*e\*x/(d\*x + c) + a\*e/(d\*x + c)) + 12\*a<sup>5</sup>\*log(b\*x + a)/b<sup>5</sup> - 12\*c<sup>5</sup>\*log(d\*x + c)/d<sup>5</sup> - (3\*(b<sup>4</sup>\*c\*d<sup>3</sup> - a\*b<sup>3</sup>\*d<sup>4</sup>)\*x<sup>4</sup> - 4\*(b<sup>4</sup>\*c<sup>2</sup>\*d<sup>2</sup> - a<sup>2</sup>\*b<sup>2</sup>\*d<sup>4</sup>)\*x<sup>3</sup> + 6\*(b<sup>4</sup>\*c<sup>3</sup>\*d - a<sup>3</sup>\*b\*d<sup>4</sup>)\*x<sup>2</sup> - 12\*(b<sup>4</sup>\*c<sup>4</sup> - a<sup>4</sup>\*d<sup>4</sup>)\*x)/(b<sup>4</sup>\*d<sup>4</sup>))\*B\*b\*d<sup>3</sup>\*g\*i<sup>3</sup> + A\*a\*c<sup>3</sup>\*g\*i<sup>3</sup>\*x

**Fricas [A]** time = 1.21094, size = 1057, normalized size = 3.9

$24 Ab^5 d^5 g i^3 x^5 + 6 \left( (15 A - B) b^5 c d^4 + (5 A + B) a b^4 d^5 \right) g i^3 x^4 + 2 \left( (60 A - 11 B) b^5 c^2 d^3 + 10 (6 A + B) a b^4 c d^4 + B a^2 b^3 d^5 \right) g i^3 x^3 + \dots$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c))),x, algorithm="fricas")

[Out] 1/120\*(24\*A\*b<sup>5</sup>\*d<sup>5</sup>\*g\*i<sup>3</sup>\*x<sup>5</sup> + 6\*((15\*A - B)\*b<sup>5</sup>\*c\*d<sup>4</sup> + (5\*A + B)\*a\*b<sup>4</sup>\*d<sup>5</sup>)\*g\*i<sup>3</sup>\*x<sup>4</sup> + 2\*((60\*A - 11\*B)\*b<sup>5</sup>\*c<sup>2</sup>\*d<sup>3</sup> + 10\*(6\*A + B)\*a\*b<sup>4</sup>\*c\*d<sup>4</sup> + B\*a<sup>2</sup>\*b<sup>3</sup>\*d<sup>5</sup>)\*g\*i<sup>3</sup>\*x<sup>3</sup> + 3\*((20\*A - 9\*B)\*b<sup>5</sup>\*c<sup>3</sup>\*d<sup>2</sup> + 5\*(12\*A + B)\*a\*b<sup>4</sup>\*c<sup>2</sup>\*d<sup>3</sup> + 5\*B\*a<sup>2</sup>\*b<sup>3</sup>\*c\*d<sup>4</sup> - B\*a<sup>3</sup>\*b<sup>2</sup>\*d<sup>5</sup>)\*g\*i<sup>3</sup>\*x<sup>2</sup> - 6\*(B\*b<sup>5</sup>\*c<sup>4</sup>\*d - 5\*(4\*A - B)\*a\*b<sup>4</sup>\*c<sup>3</sup>\*d<sup>2</sup> - 10\*B\*a<sup>2</sup>\*b<sup>3</sup>\*c<sup>2</sup>\*d<sup>3</sup> + 5\*B\*a<sup>3</sup>\*b<sup>2</sup>\*c\*d<sup>4</sup> - B\*a<sup>4</sup>\*b\*d<sup>5</sup>)\*g\*i<sup>3</sup>\*x + 6\*(10\*B\*a<sup>2</sup>\*b<sup>3</sup>\*c<sup>3</sup>\*d<sup>2</sup> - 10\*B\*a<sup>3</sup>\*b<sup>2</sup>\*c<sup>2</sup>\*d<sup>3</sup> + 5\*B\*a<sup>4</sup>\*b\*c\*d<sup>4</sup> - B\*a<sup>5</sup>\*d<sup>5</sup>)\*g\*i<sup>3</sup>\*log(b\*x + a) + 6\*(B\*b<sup>5</sup>\*c<sup>5</sup> - 5\*B\*a\*b<sup>4</sup>\*c<sup>4</sup>\*d)\*g\*i<sup>3</sup>\*log(d\*x + c) + 6\*(4\*B\*b<sup>5</sup>\*d<sup>5</sup>\*g\*i<sup>3</sup>\*x<sup>5</sup> + 20\*B\*a\*b<sup>4</sup>\*c<sup>3</sup>\*d<sup>2</sup>\*g\*i<sup>3</sup>\*x + 5\*(3\*B\*b<sup>5</sup>\*c\*d<sup>4</sup> + B\*a\*b<sup>4</sup>\*d<sup>5</sup>)\*g\*i<sup>3</sup>\*x<sup>4</sup> + 20\*(B\*b<sup>5</sup>\*c<sup>2</sup>\*d<sup>3</sup> + B\*a\*b<sup>4</sup>\*c\*d<sup>4</sup>)\*g\*i<sup>3</sup>\*x<sup>3</sup> + 10\*(B\*b<sup>5</sup>\*c<sup>3</sup>\*d<sup>2</sup> + 3\*B\*a\*b<sup>4</sup>\*c<sup>2</sup>\*d<sup>3</sup>)\*g\*i<sup>3</sup>\*x<sup>2</sup>)\*log((b\*e\*x + a\*e)/(d\*x + c)))/(b<sup>4</sup>\*d<sup>2</sup>)

**Sympy [B]** time = 9.48581, size = 1187, normalized size = 4.38

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)\*\*3\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c))),x)

[Out] A\*b\*d\*\*3\*g\*i\*\*3\*x\*\*5/5 - B\*a\*\*2\*g\*i\*\*3\*(a\*\*3\*d\*\*3 - 5\*a\*\*2\*b\*c\*d\*\*2 + 10\*a\*b\*\*2\*c\*\*2\*d - 10\*b\*\*3\*c\*\*3)\*log(x + (B\*a\*\*5\*c\*d\*\*4\*g\*i\*\*3 - 5\*B\*a\*\*4\*b\*c\*\*2

```

*d**3*g*i**3 + 10*B*a**3*b**2*c**3*d**2*g*i**3 + B*a**3*d**2*g*i**3*(a**3*d
**3 - 5*a**2*b*c*d**2 + 10*a*b**2*c**2*d - 10*b**3*c**3)/b - 15*B*a**2*b**3
*c**4*d*g*i**3 - B*a**2*c*d*g*i**3*(a**3*d**3 - 5*a**2*b*c*d**2 + 10*a*b**2
*c**2*d - 10*b**3*c**3) + B*a*b**4*c**5*g*i**3)/(B*a**5*d**5*g*i**3 - 5*B*a
**4*b*c*d**4*g*i**3 + 10*B*a**3*b**2*c**2*d**3*g*i**3 - 10*B*a**2*b**3*c**3
*d**2*g*i**3 - 5*B*a*b**4*c**4*d*g*i**3 + B*b**5*c**5*g*i**3))/(20*b**4) -
B*c**4*g*i**3*(5*a*d - b*c)*log(x + (B*a**5*c*d**4*g*i**3 - 5*B*a**4*b*c**2
*d**3*g*i**3 + 10*B*a**3*b**2*c**3*d**2*g*i**3 - 15*B*a**2*b**3*c**4*d*g*i
**3 + B*a*b**4*c**5*g*i**3 + B*a*b**3*c**4*g*i**3*(5*a*d - b*c) - B*b**4*c**
5*g*i**3*(5*a*d - b*c)/d)/(B*a**5*d**5*g*i**3 - 5*B*a**4*b*c*d**4*g*i**3 +
10*B*a**3*b**2*c**2*d**3*g*i**3 - 10*B*a**2*b**3*c**3*d**2*g*i**3 - 5*B*a*b
**4*c**4*d*g*i**3 + B*b**5*c**5*g*i**3))/(20*d**2) + x**4*(A*a*d**3*g*i**3/
4 + 3*A*b*c*d**2*g*i**3/4 + B*a*d**3*g*i**3/20 - B*b*c*d**2*g*i**3/20) + (B
*a*c**3*g*i**3*x + 3*B*a*c**2*d*g*i**3*x**2/2 + B*a*c*d**2*g*i**3*x**3 + B
*a*d**3*g*i**3*x**4/4 + B*b*c**3*g*i**3*x**2/2 + B*b*c**2*d*g*i**3*x**3 + 3
*B*b*c*d**2*g*i**3*x**4/4 + B*b*d**3*g*i**3*x**5/5)*log(e*(a + b*x)/(c + d*x
)) + x**3*(60*A*a*b*c*d**2*g*i**3 + 60*A*b**2*c**2*d*g*i**3 + B*a**2*d**3*g
*i**3 + 10*B*a*b*c*d**2*g*i**3 - 11*B*b**2*c**2*d*g*i**3)/(60*b) - x**2*(-6
0*A*a*b**2*c**2*d*g*i**3 - 20*A*b**3*c**3*g*i**3 + B*a**3*d**3*g*i**3 - 5*B
*a**2*b*c*d**2*g*i**3 - 5*B*a*b**2*c**2*d*g*i**3 + 9*B*b**3*c**3*g*i**3)/(4
0*b**2) + x*(20*A*a*b**3*c**3*d*g*i**3 + B*a**4*d**4*g*i**3 - 5*B*a**3*b*c
d**3*g*i**3 + 10*B*a**2*b**2*c**2*d**2*g*i**3 - 5*B*a*b**3*c**3*d*g*i**3 -
B*b**4*c**4*g*i**3)/(20*b**3*d)

```

**Giac [B]** time = 21.1528, size = 690, normalized size = 2.55

$$-\frac{1}{5} (Abd^3gi + Bbd^3gi)x^5 - \frac{1}{20} (15Abcd^2gi + 14Bbcd^2gi + 5Aad^3gi + 6Bad^3gi)x^4 - \frac{(60Ab^2c^2dgi + 49Bb^2c^2dgi + 60Aa^2b^2c^2dgi + 49Bb^2c^2dgi + 60Aa^2b^2c^2dgi + 70Baa^2b^2c^2dgi + Ba^2d^3gi)x^3}{60} - \frac{1}{20} (4Bb^2d^3gix^5 + 20Baa^2c^3gix + 5(3Bb^2c^2dgi + Ba^2d^3gi)x^4 + 20(Bb^2c^2dgi + Ba^2c^2dgi)x^3 + 10(Bb^2c^3gi + 3Baa^2c^2dgi)x^2) \log\left(\frac{bx+a}{dx+c}\right) - \frac{1}{40} (20Aa^2b^3c^3gix + 11Bb^3c^3gix + 60Aa^2b^2c^2dgi + 65Baa^2b^2c^2dgi + 5Ba^2b^2c^2dgi - Ba^3d^3gi)x^2/b^2 - \frac{1}{20} (Bb^2c^5gi - 5Ba^2c^4dgi)x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c))),x, algorithm="giac")

[Out] -1/5\*(A\*b\*d^3\*g\*i + B\*b\*d^3\*g\*i)\*x^5 - 1/20\*(15\*A\*b\*c\*d^2\*g\*i + 14\*B\*b\*b\*c\*d^2\*g\*i + 5\*A\*a\*d^3\*g\*i + 6\*B\*a\*d^3\*g\*i)\*x^4 - 1/60\*(60\*A\*b^2\*c^2\*d\*g\*i + 49\*B\*b^2\*c^2\*d\*g\*i + 60\*A\*a\*b\*c\*d^2\*g\*i + 70\*B\*a\*a\*b\*c\*d^2\*g\*i + B\*a^2\*d^3\*g\*i)\*x^3/b - 1/20\*(4\*B\*b\*d^3\*g\*i\*x^5 + 20\*B\*a\*a^2\*c^3\*g\*i\*x + 5\*(3\*B\*b^2\*c^2\*d\*g\*i + B\*a^2\*d^3\*g\*i)\*x^4 + 20\*(B\*b^2\*c^2\*d\*g\*i + B\*a^2\*c^2\*d\*g\*i)\*x^3 + 10\*(B\*b^2\*c^3\*g\*i + 3\*B\*a^2\*c^2\*d\*g\*i)\*x^2)\*log((b\*x + a)/(d\*x + c)) - 1/40\*(20\*A\*a^2\*b^3\*c^3\*g\*i + 11\*B\*b^3\*c^3\*g\*i + 60\*A\*a^2\*b^2\*c^2\*d\*g\*i + 65\*B\*a\*a^2\*b^2\*c^2\*d\*g\*i + 5\*B\*a^2\*b^2\*c^2\*d\*g\*i - B\*a^3\*d^3\*g\*i)\*x^2/b^2 - 1/20\*(B\*b^2\*c^5\*g\*i - 5\*B\*a^2\*c^4\*d\*g\*i)\*x

$$\log(-dix - ci)/d^2 + 1/20*(B*b^4*c^4*gi - 20*A*a*b^3*c^3*d*gi - 15*B*a*b^3*c^3*d*gi - 10*B*a^2*b^2*c^2*d^2*gi + 5*B*a^3*b*c*d^3*gi - B*a^4*d^4*gi)*x/(b^3*d) - 1/20*(10*B*a^2*b^3*c^3*gi - 10*B*a^3*b^2*c^2*d*gi + 5*B*a^4*b*c*d^2*gi - B*a^5*d^3*gi)*\log(b*x + a)/b^4$$

### 3.23 $\int (ci + dix)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) dx$

**Optimal.** Leaf size=149

$$\frac{i^3(c+dx)^4 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{4d} - \frac{Bi^3x(bc-ad)^3}{4b^3} - \frac{Bi^3(c+dx)^2(bc-ad)^2}{8b^2d} - \frac{Bi^3(bc-ad)^4 \log(a+bx)}{4b^4d} - \frac{Bi^3(c+dx)^3(bc-ad)}{12bd}$$

[Out]  $-(B*(b*c - a*d)^3*i^3*x)/(4*b^3) - (B*(b*c - a*d)^2*i^3*(c + d*x)^2)/(8*b^2*d) - (B*(b*c - a*d)*i^3*(c + d*x)^3)/(12*b*d) - (B*(b*c - a*d)^4*i^3*\text{Log}[a + b*x])/(4*b^4*d) + (i^3*(c + d*x)^4*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(4*d)$

**Rubi [A]** time = 0.0805712, antiderivative size = 149, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 30,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.1$ , Rules used = {2525, 12, 43}

$$\frac{i^3(c+dx)^4 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{4d} - \frac{Bi^3x(bc-ad)^3}{4b^3} - \frac{Bi^3(c+dx)^2(bc-ad)^2}{8b^2d} - \frac{Bi^3(bc-ad)^4 \log(a+bx)}{4b^4d} - \frac{Bi^3(c+dx)^3(bc-ad)}{12bd}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[(c*i + d*i*x)^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]), x]$

[Out]  $-(B*(b*c - a*d)^3*i^3*x)/(4*b^3) - (B*(b*c - a*d)^2*i^3*(c + d*x)^2)/(8*b^2*d) - (B*(b*c - a*d)*i^3*(c + d*x)^3)/(12*b*d) - (B*(b*c - a*d)^4*i^3*\text{Log}[a + b*x])/(4*b^4*d) + (i^3*(c + d*x)^4*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(4*d)$

#### Rule 2525

$\text{Int}[(a + \text{Log}[(c + \text{RFX})^p])*(b + (d + e*x)^m)^n], x\_Symbol] \rightarrow \text{Simp}[(d + e*x)^{m+1}*(a + b*\text{Log}[c*\text{RFX}^p])^n/(e^{m+1}), x] - \text{Dist}[(b*n*p)/(e^{m+1}), \text{Int}[\text{SimplifyIntegrand}[(d + e*x)^{m+1}*(a + b*\text{Log}[c*\text{RFX}^p])^{n-1}*D[\text{RFX}, x])/RFX, x], x] /;$  FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

#### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

### Rule 43

```
Int[((a_.) + (b_.)*(x_.))^(m_.)*((c_.) + (d_.)*(x_.))^(n_.), x_Symbol] := Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

### Rubi steps

$$\begin{aligned} \int (23c + 23dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) dx &= \frac{12167(c+dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{4d} - \frac{B \int \frac{279841(bc-ad)(c+dx)^3}{a+bx} dx}{92d} \\ &= \frac{12167(c+dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{4d} - \frac{(12167B(bc-ad)) \int \frac{(c+dx)^3}{a+bx} dx}{4d} \\ &= \frac{12167(c+dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{4d} - \frac{(12167B(bc-ad)) \int \left( \frac{d(bc-ad)^2}{b^3} + \right)}{4d} \\ &= -\frac{12167B(bc-ad)^3 x}{4b^3} - \frac{12167B(bc-ad)^2(c+dx)^2}{8b^2 d} - \frac{12167B(bc-ad)(c+dx)}{12bd} \end{aligned}$$

**Mathematica [A]** time = 0.0586556, size = 120, normalized size = 0.81

$$\frac{i^3 \left( (c+dx)^4 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right) - \frac{B(bc-ad)(3b^2(c+dx)^2(bc-ad)+6bdx(bc-ad)^2+6(bc-ad)^3 \log(a+bx)+2b^3(c+dx)^3)}{6b^4} \right)}{4d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] (i^3*(-(B*(b*c - a*d)*(6*b*d*(b*c - a*d)^2*x + 3*b^2*(b*c - a*d)*(c + d*x)^
2 + 2*b^3*(c + d*x)^3 + 6*(b*c - a*d)^3*Log[a + b*x]))/(6*b^4) + (c + d*x)^
4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(4*d)
```

---

**Maple [B]** time = 0.171, size = 2172, normalized size = 14.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In]  $\text{int}((d*i*x+c*i)^3*(A+B*\ln(e*(b*x+a)/(d*x+c))),x)$

[Out] 
$$\begin{aligned} & -1/8*e^2/d*B*i^3*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^4+1/2*e^2*d^2*B*i^3/ \\ & b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3*c-e*d^2*B*i^3/b^2/(d*e/(d*x+c)*a-e/(d \\ & *x+c)*b*c)*a^3*c+3/2*e*d*B*i^3/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2*c^2+1/4* \\ & e^4/d*B*i^3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4 \\ & *c^4*b^4-e^4*B*i^3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c) \\ & *b*c)^4*c^3*b^3*a+1/2*e^2*B*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a*c^3*b-1/3 \\ & *e^3*d^2*B*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^3*c-e^4*A*i^3/(d*e/(d*x+c) \\ & *a-e/(d*x+c)*b*c)^4*b^3*c^3*a-1/3*e^3*B*i^3*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b* \\ & c)^3*c^3*a-e^4*d^2*A*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^3*b*c+3/2*e^4*d* \\ & A*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^2*b^2*c^2+1/2*e^3*d*B*i^3/(d*e/(d*x \\ & +c)*a-e/(d*x+c)*b*c)^3*a^2*c^2*b+1/4/d*B*i^3*\ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x \\ & +c))-b*e)*c^4+1/4*e^4*d^3*A*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^4+1/4*d^3 \\ & *B*i^3/b^4*\ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^4-B*i^3/b*\ln(d*(b*e/d+ \\ & (a*d-b*c)*e/d/(d*x+c))-b*e)*a*c^3-e*B*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^3 \\ & *a-1/8*e^2*d^3*B*i^3/b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^4+1/12*e^3*d^3*B \\ & *i^3/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^4+3/2*d*B*i^3/b^2*\ln(d*(b*e/d+(a*d \\ & -b*c)*e/d/(d*x+c))-b*e)*a^2*c^2-d^2*B*i^3/b^3*\ln(d*(b*e/d+(a*d-b*c)*e/d/(d* \\ & x+c))-b*e)*a^3*c+1/4*e^4*d^3*B*i^3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d* \\ & x+c)*a-e/(d*x+c)*b*c)^4*a^4-e^4*d^2*B*i^3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/( \\ & d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^3*b*c+2*e^4*B*i^3*\ln(b*e/d+(a*d-b*c)*e/d/( \\ & d*x+c))*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a*c^7/(d*x+c)^4-35/2*e^4*d^3*B* \\ & i^3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^4*c^4 \\ & /d*x+c)^4+1/4*e/d*B*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^4*b+3/2*e^4*d*B*i^ \\ & 3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^2*c \\ & ^2-1/4*e^4/d*B*i^3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^4/(d*e/(d*x+c)*a-e/(d* \\ & x+c)*b*c)^4*c^8/(d*x+c)^4-1/4*e^4*d^7*B*i^3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)) \\ & /b^4/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^8/(d*x+c)^4+1/4*e^4/d*A*i^3/(d*e/(d* \\ & x+c)*a-e/(d*x+c)*b*c)^4*b^4*c^4-3/4*e^2*d*B*i^3/(d*e/(d*x+c)*a-e/(d*x+c)*b* \\ & c)^2*a^2*c^2+1/12*e^3/d*B*i^3*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^4+1/4*e \\ & *d^3*B*i^3/b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^4+2*e^4*d^6*B*i^3*\ln(b*e/d+( \\ & a*d-b*c)*e/d/(d*x+c))/b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^7*c/(d*x+c)^4+1 \\ & 4*e^4*d^4*B*i^3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/b/(d*e/(d*x+c)*a-e/(d*x+c)* \\ & b*c)^4*a^5*c^3/(d*x+c)^4+14*e^4*d^2*B*i^3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/( \\ & d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^3*c^5/(d*x+c)^4*b-7*e^4*d^5*B*i^3*\ln(b*e/d \\ & +(a*d-b*c)*e/d/(d*x+c))/b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^4*a^6*c^2/(d*x+c) \\ & ^4-7*e^4*d*B*i^3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2/(d*e/(d*x+c)*a-e/(d*x+ \\ & c)*b*c)^4*a^2*c^6/(d*x+c)^4 \end{aligned}$$

**Maxima [B]** time = 1.18331, size = 593, normalized size = 3.98

$$\frac{1}{4} Ad^3 i^3 x^4 + Acd^2 i^3 x^3 + \frac{3}{2} Ac^2 di^3 x^2 + \left( x \log\left(\frac{bex}{dx+c} + \frac{ae}{dx+c}\right) + \frac{a \log(bx+a)}{b} - \frac{c \log(dx+c)}{d} \right) Bc^3 i^3 + \frac{3}{2} \left( x^2 \log\left(\frac{b}{dx+c} + \frac{ae}{dx+c}\right) + \frac{a \log(bx+a)}{b} - \frac{c \log(dx+c)}{d} \right) Bc^3 i^3$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c))),x, algorithm="maxima")

[Out] 1/4\*A\*d^3\*i^3\*x^4 + A\*c\*d^2\*i^3\*x^3 + 3/2\*A\*c^2\*d\*i^3\*x^2 + (x\*log(b\*e\*x/(d\*x+c) + a\*e/(d\*x+c)) + a\*log(b\*x+a)/b - c\*log(d\*x+c)/d)\*B\*c^3\*i^3 + 3/2\*(x^2\*log(b\*e\*x/(d\*x+c) + a\*e/(d\*x+c)) - a^2\*log(b\*x+a)/b^2 + c^2\*log(d\*x+c)/d^2 - (b\*c - a\*d)\*x/(b\*d))\*B\*c^2\*d\*i^3 + 1/2\*(2\*x^3\*log(b\*e\*x/(d\*x+c) + a\*e/(d\*x+c)) + 2\*a^3\*log(b\*x+a)/b^3 - 2\*c^3\*log(d\*x+c)/d^3 - ((b^2\*c\*d - a\*b\*d^2)\*x^2 - 2\*(b^2\*c^2 - a^2\*d^2)\*x)/(b^2\*d^2))\*B\*c\*d^2\*i^3 + 1/24\*(6\*x^4\*log(b\*e\*x/(d\*x+c) + a\*e/(d\*x+c)) - 6\*a^4\*log(b\*x+a)/b^4 + 6\*c^4\*log(d\*x+c)/d^4 - (2\*(b^3\*c\*d^2 - a\*b^2\*d^3)\*x^3 - 3\*(b^3\*c^2\*d - a^2\*b\*d^3)\*x^2 + 6\*(b^3\*c^3 - a^3\*d^3)\*x)/(b^3\*d^3))\*B\*d^3\*i^3 + A\*c^3\*i^3\*x

**Fricas [B]** time = 0.838573, size = 664, normalized size = 4.46

$$6Ab^4d^4i^3x^4 - 6Bb^4c^4i^3 \log(dx+c) + 2((12A-B)b^4cd^3 + Bab^3d^4)i^3x^3 + 3(3(4A-B)b^4c^2d^2 + 4Bab^3cd^3 - Ba^2b^2d^4)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c))),x, algorithm="fricas")

[Out] 1/24\*(6\*A\*b^4\*d^4\*i^3\*x^4 - 6\*B\*b^4\*c^4\*i^3\*log(d\*x+c) + 2\*((12\*A - B)\*b^4\*c\*d^3 + B\*a\*b^3\*d^4)\*i^3\*x^3 + 3\*(3\*(4\*A - B)\*b^4\*c^2\*d^2 + 4\*B\*a\*b^3\*c\*d^3 - B\*a^2\*b^2\*d^4)\*i^3\*x^2 + 6\*((4\*A - 3\*B)\*b^4\*c^3\*d + 6\*B\*a\*b^3\*c^2\*d^2 - 4\*B\*a^2\*b^2\*c\*d^3 + B\*a^3\*b\*d^4)\*i^3\*x + 6\*(4\*B\*a\*b^3\*c^3\*d - 6\*B\*a^2\*b^2\*c^2\*d^2 + 4\*B\*a^3\*b\*c\*d^3 - B\*a^4\*d^4)\*i^3\*log(b\*x+a) + 6\*(B\*b^4\*d^4\*i^3\*x^4 + 4\*B\*b^4\*c\*d^3\*i^3\*x^3 + 6\*B\*b^4\*c^2\*d^2\*i^3\*x^2 + 4\*B\*b^4\*c^3\*d\*i^3\*x)\*log((b\*e\*x + a\*e)/(d\*x+c))/(b^4\*d)

**Sympy [B]** time = 5.2841, size = 719, normalized size = 4.83

$$\frac{Ad^3i^3x^4}{4} - \frac{Bai^3(ad-2bc)(a^2d^2-2abcd+2b^2c^2)\log\left(x + \frac{Ba^4cd^3i^3-4Ba^3bc^2d^2i^3+6Ba^2b^2c^3di^3+\frac{Ba^2di^3(ad-2bc)(a^2d^2-2abcd+2b^2c^2)}{b}-5Bab^3c^4i^3}{Ba^4d^4i^3-4Ba^3bcd^3i^3+6Ba^2b^2c^2d^2i^3-4Bab^3c^3di^3-Ba^4d^4i^3}}{4b^4}\right)}{4b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*\*3\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c))),x)

[Out] A\*d\*\*3\*i\*\*3\*x\*\*4/4 - B\*a\*i\*\*3\*(a\*d - 2\*b\*c)\*(a\*\*2\*d\*\*2 - 2\*a\*b\*c\*d + 2\*b\*\*2\*c\*\*2)\*log(x + (B\*a\*\*4\*c\*d\*\*3\*i\*\*3 - 4\*B\*a\*\*3\*b\*c\*\*2\*d\*\*2\*i\*\*3 + 6\*B\*a\*\*2\*b\*\*2\*c\*\*3\*d\*i\*\*3 + B\*a\*\*2\*d\*i\*\*3\*(a\*d - 2\*b\*c)\*(a\*\*2\*d\*\*2 - 2\*a\*b\*c\*d + 2\*b\*\*2\*c\*\*2)/b - 5\*B\*a\*b\*\*3\*c\*\*4\*i\*\*3 - B\*a\*c\*i\*\*3\*(a\*d - 2\*b\*c)\*(a\*\*2\*d\*\*2 - 2\*a\*b\*c\*d + 2\*b\*\*2\*c\*\*2))/(B\*a\*\*4\*d\*\*4\*i\*\*3 - 4\*B\*a\*\*3\*b\*c\*d\*\*3\*i\*\*3 + 6\*B\*a\*\*2\*b\*\*2\*c\*\*2\*d\*\*2\*i\*\*3 - 4\*B\*a\*b\*\*3\*c\*\*3\*d\*i\*\*3 - B\*b\*\*4\*c\*\*4\*i\*\*3))/(4\*b\*\*4) - B\*c\*\*4\*i\*\*3\*log(x + (B\*a\*\*4\*c\*d\*\*3\*i\*\*3 - 4\*B\*a\*\*3\*b\*c\*\*2\*d\*\*2\*i\*\*3 + 6\*B\*a\*\*2\*b\*\*2\*c\*\*3\*d\*i\*\*3 - 4\*B\*a\*b\*\*3\*c\*\*4\*i\*\*3 - B\*b\*\*4\*c\*\*5\*i\*\*3/d)/(B\*a\*\*4\*d\*\*4\*i\*\*3 - 4\*B\*a\*\*3\*b\*c\*d\*\*3\*i\*\*3 + 6\*B\*a\*\*2\*b\*\*2\*c\*\*2\*d\*\*2\*i\*\*3 - 4\*B\*a\*b\*\*3\*c\*\*3\*d\*i\*\*3 - B\*b\*\*4\*c\*\*4\*i\*\*3))/(4\*d) + (B\*c\*\*3\*i\*\*3\*x + 3\*B\*c\*\*2\*d\*i\*\*3\*x\*\*2/2 + B\*c\*d\*\*2\*i\*\*3\*x\*\*3 + B\*d\*\*3\*i\*\*3\*x\*\*4/4)\*log(e\*(a + b\*x)/(c + d\*x)) + x\*\*3\*(12\*A\*b\*c\*d\*\*2\*i\*\*3 + B\*a\*d\*\*3\*i\*\*3 - B\*b\*c\*d\*\*2\*i\*\*3)/(12\*b) - x\*\*2\*(-12\*A\*b\*\*2\*c\*\*2\*d\*i\*\*3 + B\*a\*\*2\*d\*\*3\*i\*\*3 - 4\*B\*a\*b\*c\*d\*\*2\*i\*\*3 + 3\*B\*b\*\*2\*c\*\*2\*d\*i\*\*3)/(8\*b\*\*2) + x\*(4\*A\*b\*\*3\*c\*\*3\*i\*\*3 + B\*a\*\*3\*d\*\*3\*i\*\*3 - 4\*B\*a\*\*2\*b\*c\*d\*\*2\*i\*\*3 + 6\*B\*a\*b\*\*2\*c\*\*2\*d\*i\*\*3 - 3\*B\*b\*\*3\*c\*\*3\*i\*\*3)/(4\*b\*\*3)

**Giac [B]** time = 1.49911, size = 606, normalized size = 4.07

$$-\frac{1}{4}(Ad^3i + Bd^3i)x^4 - \frac{(12Abcd^2i + 11Bbcd^2i + Bad^3i)x^3}{12b} - \frac{1}{4}(Bd^3ix^4 + 4Bcd^2ix^3 + 6Bc^2dix^2 + 4Bc^3ix)\log\left(\frac{bx+a}{dx+c}\right) -$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c))),x, algorithm="giac")

[Out] -1/4\*(A\*d^3\*i + B\*d^3\*i)\*x^4 - 1/12\*(12\*A\*b\*c\*d^2\*i + 11\*B\*b\*c\*d^2\*i + B\*a\*d^3\*i)\*x^3/b - 1/4\*(B\*d^3\*i\*x^4 + 4\*B\*c\*d^2\*i\*x^3 + 6\*B\*c^2\*d\*i\*x^2 + 4\*B\*c^3\*i\*x)\*log((b\*x + a)/(d\*x + c)) - 1/8\*(12\*A\*b^2\*c^2\*d\*i + 9\*B\*b^2\*c^2\*d\*i + 4\*B\*a\*b\*c\*d^2\*i - B\*a^2\*d^3\*i)\*x^2/b^2 - 1/4\*(4\*A\*b^3\*c^3\*i + B\*b^3\*c^3\*i



$$\begin{aligned}
& + 6* B * a * b^2 * c^2 * d^i - 4 * B * a^2 * b * c * d^2 * i + B * a^3 * d^3 * i) * x / b^3 + 1/8 * (B * b^4 * \\
& c^4 * i - 4 * B * a * b^3 * c^3 * d^i + 6 * B * a^2 * b^2 * c^2 * d^2 * i - 4 * B * a^3 * b * c * d^3 * i + B * a \\
& ^4 * d^4 * i) * \log(\text{abs}(b * d * x^2 + b * c * x + a * d * x + a * c)) / (b^4 * d) - 1/8 * (B * b^5 * c^5 * \\
& i + 3 * B * a * b^4 * c^4 * d^i - 10 * B * a^2 * b^3 * c^3 * d^2 * i + 10 * B * a^3 * b^2 * c^2 * d^3 * i - 5 \\
& * B * a^4 * b * c * d^4 * i + B * a^5 * d^5 * i) * \log(\text{abs}((2 * b * d * x + b * c + a * d - \text{abs}(-b * c + a \\
& * d)) / (2 * b * d * x + b * c + a * d + \text{abs}(-b * c + a * d)))) / (b^4 * d * \text{abs}(-b * c + a * d))
\end{aligned}$$

$$3.24 \quad \int \frac{(ci+dx)^3 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{ag+bgx} dx$$

**Optimal.** Leaf size=356

$$\frac{Bi^3(bc-ad)^3 \text{PolyLog}\left(2, \frac{b(c+dx)}{d(a+bx)}\right)}{b^4g} + \frac{i^3(c+dx)^2(bc-ad) \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{2b^2g} + \frac{di^3(a+bx)(bc-ad)^2 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{b^4g}$$

[Out]  $(-5*B*d*(b*c - a*d)^2*i^3*x)/(6*b^3*g) - (B*(b*c - a*d)*i^3*(c + d*x)^2)/(6*b^2*g) - (5*B*(b*c - a*d)^3*i^3*Log[(a + b*x)/(c + d*x)])/(6*b^4*g) + (d*(b*c - a*d)^2*i^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^4*g) + ((b*c - a*d)*i^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*b^2*g) + (i^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b*g) - (11*B*(b*c - a*d)^3*i^3*Log[c + d*x]/(6*b^4*g) - ((b*c - a*d)^3*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^4*g) + (B*(b*c - a*d)^3*i^3*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g)$

**Rubi [A]** time = 0.601841, antiderivative size = 436, normalized size of antiderivative = 1.22, number of steps used = 23, number of rules used = 13, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.325$ , Rules used = {2528, 2486, 31, 2524, 12, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 43}

$$\frac{Bi^3(bc-ad)^3 \text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{b^4g} + \frac{i^3(c+dx)^2(bc-ad) \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{2b^2g} + \frac{i^3(bc-ad)^3 \log(ag+bgx) \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{b^4g}$$

Antiderivative was successfully verified.

[In] Int[((c\*i + d\*i\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(a\*g + b\*g\*x), x]

[Out]  $(A*d*(b*c - a*d)^2*i^3*x)/(b^3*g) - (5*B*d*(b*c - a*d)^2*i^3*x)/(6*b^3*g) - (B*(b*c - a*d)*i^3*(c + d*x)^2)/(6*b^2*g) - (5*B*(b*c - a*d)^3*i^3*Log[a + b*x]/(6*b^4*g) - (B*(b*c - a*d)^3*i^3*Log[g*(a + b*x)]^2)/(2*b^4*g) + (B*d*(b*c - a*d)^2*i^3*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)]/(b^4*g) + ((b*c - a*d)*i^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*b^2*g) + (i^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b*g) - (B*(b*c - a*d)^3*i^3*Log[c + d*x]/(b^4*g) + ((b*c - a*d)^3*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]*Log[a*g + b*g*x])/(b^4*g) + (B*(b*c - a*d)^3*i^3*Log[(b*(c + d*x))/(b*c - a*d)]*Log[a*g + b*g*x])/(b^4*g) + (B*(b*c - a*d)^3*i^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^4*g)$

Rule 2528

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*(RGx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

Rule 2486

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.), x\_Symbol] := Simp[((a + b\*x)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/b, x] + Dist[(q\*r\*s\*(b\*c - a\*d))/b, Int[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1)/(c + d\*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]

Rule 31

Int[((a\_) + (b\_.)\*(x\_))^-1, x\_Symbol] := Simp[Log[RemoveContent[a + b\*x, x]]/b, x] /; FreeQ[{a, b}, x]

Rule 2524

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^n)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

Rule 12

Int[(a\_)\*(u\_), x\_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b\_.)\*(v\_) /; FreeQ[b, x]]

Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*(RFx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]

Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.)\*(x\_))^(q\_.), x\_Symbol] := Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E

qQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] := Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n]))/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] := -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rule 2525

Int[((a\_.) + Log[(c\_.)\*(Rfx\_)^(p\_.)]\*(b\_.))^(n\_.)\*((d\_.) + (e\_.)\*(x\_)^(m\_.)), x\_Symbol] := Simp[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*Rfx^p])^n)/(e\*(m + 1)), x] - Dist[(b\*n\*p)/(e\*(m + 1)), Int[SimplifyIntegrand[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*Rfx^p])^(n - 1)\*D[Rfx, x])/Rfx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

### Rule 43

Int[((a\_.) + (b\_.)\*(x\_)^(m\_.))\*((c\_.) + (d\_.)\*(x\_)^(n\_.)), x\_Symbol] := Int[ExpandIntegrand[(a + b\*x)^m\*(c + d\*x)^n, x], x] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b\*c - a\*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && LeQ[7\*m + 4\*n + 4, 0]) || LtQ[9\*m + 5\*(n + 1), 0] || GtQ[m + n + 2, 0])

### Rubi steps

$$\begin{aligned}
\int \frac{(24c + 24dx)^3 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{ag + bgx} dx &= \int \left( \frac{13824d(bc - ad)^2 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{b^3g} + \frac{576d(bc - ad)(24c + 24dx) \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{b^2g} \right) dx \\
&= \frac{(13824(bc - ad)^3) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{ag+bgx} dx}{b^3} + \frac{(24d) \int (24c + 24dx)^2 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right) dx}{bg} \\
&= \frac{13824Ad(bc - ad)^2x}{b^3g} + \frac{6912(bc - ad)(c + dx)^2 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{b^2g} + \frac{4608Bd(bc - ad)(c + dx) \log\left(\frac{e(a+bx)}{c+dx}\right)}{b^2g} \\
&= \frac{13824Ad(bc - ad)^2x}{b^3g} + \frac{13824Bd(bc - ad)^2(a + bx) \log\left(\frac{e(a+bx)}{c+dx}\right)}{b^4g} + \frac{6912Bd(bc - ad)(c + dx) \log\left(\frac{e(a+bx)}{c+dx}\right)}{b^4g} \\
&= \frac{13824Ad(bc - ad)^2x}{b^3g} + \frac{13824Bd(bc - ad)^2(a + bx) \log\left(\frac{e(a+bx)}{c+dx}\right)}{b^4g} + \frac{6912Bd(bc - ad)(c + dx) \log\left(\frac{e(a+bx)}{c+dx}\right)}{b^4g} \\
&= \frac{13824Ad(bc - ad)^2x}{b^3g} - \frac{11520Bd(bc - ad)^2x}{b^3g} - \frac{2304B(bc - ad)(c + dx)^2}{b^2g} - \frac{2304Bd(bc - ad)(c + dx) \log\left(\frac{e(a+bx)}{c+dx}\right)}{b^2g} \\
&= \frac{13824Ad(bc - ad)^2x}{b^3g} - \frac{11520Bd(bc - ad)^2x}{b^3g} - \frac{2304B(bc - ad)(c + dx)^2}{b^2g} - \frac{2304Bd(bc - ad)(c + dx) \log\left(\frac{e(a+bx)}{c+dx}\right)}{b^2g} \\
&= \frac{13824Ad(bc - ad)^2x}{b^3g} - \frac{11520Bd(bc - ad)^2x}{b^3g} - \frac{2304B(bc - ad)(c + dx)^2}{b^2g} - \frac{2304Bd(bc - ad)(c + dx) \log\left(\frac{e(a+bx)}{c+dx}\right)}{b^2g} \\
&= \frac{13824Ad(bc - ad)^2x}{b^3g} - \frac{11520Bd(bc - ad)^2x}{b^3g} - \frac{2304B(bc - ad)(c + dx)^2}{b^2g} - \frac{2304Bd(bc - ad)(c + dx) \log\left(\frac{e(a+bx)}{c+dx}\right)}{b^2g}
\end{aligned}$$

**Mathematica [A]** time = 0.265892, size = 352, normalized size = 0.99

$$i^3 \left( -3B(bc - ad)^3 \left( \log(g(a + bx)) \left( \log(g(a + bx)) - 2 \log\left(\frac{b(c+dx)}{bc-ad}\right) \right) - 2 \text{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) \right) + 3b^2(c + dx)^2(bc - ad) \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) \right) \right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a*g + b*g*x), x]
```

```
[Out] (i^3*(6*A*b*d*(b*c - a*d)^2*x - 3*B*(b*c - a*d)^2*(b*d*x + (b*c - a*d)*Log[
a + b*x]) - B*(b*c - a*d)*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b*c -
a*d)^2*Log[a + b*x]) + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[(e*(a + b*x))/(c
+ d*x)] + 3*b^2*(b*c - a*d)*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]
) + 2*b^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 6*(b*c - a*d)^
3*Log[g*(a + b*x)]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 6*B*(b*c - a*d)^3
*Log[c + d*x] - 3*B*(b*c - a*d)^3*(Log[g*(a + b*x)]*(Log[g*(a + b*x)] - 2*L
og[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]
)))/(6*b^4*g)
```

**Maple [B]** time = 0.192, size = 4594, normalized size = 12.9

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g), x)
```

```
[Out] 1/2*B*i^3/g/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c^3+A*i^3/g/b*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))*c^3-B*i^3/g/b*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*
e)/b/e)*c^3+11/6*B*i^3/g/b*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c^3-A*i^
3/g/b*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c^3+5/6*e*B*i^3/g/(d*e/(d*x+c
))*a-e/(d*x+c)*b*c)*c^3-e*A*i^3/g/(d*e/(d*x+c))*a-e/(d*x+c)*b*c)*c^3-1/2*e^2*
B*i^3/g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c))*a-e/(d*x+c)*b*c)^2*c^5
/(d*x+c)^2*b+e*d^3*B*i^3/g/b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)
)*a-e/(d*x+c)*b*c)*a^3+1/3*e^3*d^3*B*i^3/g/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))
/(d*e/(d*x+c))*a-e/(d*x+c)*b*c)^3*a^3-e^3*d^2*B*i^3/g*ln(b*e/d+(a*d-b*c)*e/d
/(d*x+c))/(d*e/(d*x+c))*a-e/(d*x+c)*b*c)^3*a^2*c-3/2*e^2*d*B*i^3/g*ln(b*e/d+
(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c))*a-e/(d*x+c)*b*c)^2*a*c^2-1/2*e^2*d^3*B*
i^3/g/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c))*a-e/(d*x+c)*b*c)^2*a
^3+e*d^3*A*i^3/g/b^3/(d*e/(d*x+c))*a-e/(d*x+c)*b*c)*a^3-5/6*e*d^3*B*i^3/g/b^
3/(d*e/(d*x+c))*a-e/(d*x+c)*b*c)*a^3+3*d*B*i^3/g/b^2*dilog(-(d*(b*e/d+(a*d-b
*c)*e/d/(d*x+c))-b*e)/b/e)*c^2*a-1/6*e^2*B*i^3/g/(d*e/(d*x+c))*a-e/(d*x+c)*b
*c)^2*c^3*b-1/3*e^3*A*i^3/g*b^2/(d*e/(d*x+c))*a-e/(d*x+c)*b*c)^3*c^3-11/6*d^
3*B*i^3/g/b^4*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^3-d^3*A*i^3/g/b^4*l
n(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a^3-1/2*d^3*B*i^3/g/b^4*ln(b*e/d+(a*d-b*c)*e
/d/(d*x+c))^2*a^3+d^3*B*i^3/g/b^4*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b
e)/b/e)*a^3+d^3*A*i^3/g/b^4*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^3-1/
2*e^2*d^3*A*i^3/g/b^2/(d*e/(d*x+c))*a-e/(d*x+c)*b*c)^2*a^3-2*e^3*d^5*B*i^3/g
/b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c))*a-e/(d*x+c)*b*c)^3*a^5/(d
*x+c)^3*c+5*e^3*d^4*B*i^3/g/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c
))*a-e/(d*x+c)*b*c)^3*a^4/(d*x+c)^3*c^2-20/3*e^3*d^3*B*i^3/g/b*ln(b*e/d+(a*d
```

$$\begin{aligned}
& -b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^3/(d*x+c)^3*c^3-4*e*d^3*B*i^3/g/b^3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c) \\
& *a^3/(d*x+c)*c+6*e*d^2*B*i^3/g/b^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c) \\
& *a^2/(d*x+c)*c^2-4*e*d*B*i^3/g/b*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c) \\
& *c^3/(d*x+c)*a-5/2*e^2*d^4*B*i^3/g/b^3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c) \\
& ^2*a^4/(d*x+c)^2*c+5*e^2*d^3*B*i^3/g/b^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c) \\
& ^2*a^3/(d*x+c)^2*c^2-5*e^2*d^2*B*i^3/g/b*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c) \\
& ^2*a^2/(d*x+c)^2*c^3-2*e^3*d*B*i^3/g*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c) \\
& ^3*c^5/(d*x+c)^3*a*b-e*B*i^3/g*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c) \\
& *c^3-B*i^3/g/b*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*\ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*c^3+1/2*e^2*A*i^3/g/(d*e/(d*x+c)*a-e/(d*x+c)*b*c) \\
& ^2*c^3*b-3*d^2*B*i^3/g/b^3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*\ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e) \\
& *a^2*c+3*d*B*i^3/g/b^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*\ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e) \\
& *a*c^2-1/2*e^2*d^2*B*i^3/g/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2*c+e^3*d*B*i^3/g*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)) \\
& /((d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^2*b+a+3/2*e^2*d^2*B*i^3/g/b*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)) \\
& /((d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2*c+5*e^3*d^2*B*i^3/g*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)) \\
& /((d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^4/(d*x+c)^3*a^2+e*d^4*B*i^3/g/b^4*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)) \\
& )/((d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^4/(d*x+c)^3*e*d^2*B*i^3/g/b^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)) \\
& /((d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2*c+3*e*d*B*i^3/g/b*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)) \\
& /((d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a*c^2+1/3*e^3*d^6*B*i^3/g/b^4*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)) \\
& /((d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^6/(d*x+c)^3+1/2*e^2*d^5*B*i^3/g/b^4*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)) \\
& )/((d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^5/(d*x+c)^2+5/2*e^2*d*B*i^3/g*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)) \\
& /((d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^4/(d*x+c)^2*a+5/2*e*d^2*B*i^3/g/b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c) \\
& *a^2*c-5/2*e*d*B*i^3/g/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a*c^2+e^3*d*A*i^3/g*b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c) \\
& ^3*c^2*a+3/2*e^2*d^2*A*i^3/g/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2*c-3*e*d^2*A*i^3/g/b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c) \\
& *a^2*c+3*e*d*A*i^3/g/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a*c^2+1/3*e^3*B*i^3/g*b^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)) \\
& /((d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^6/(d*x+c)^3+1/3*e^3*d^3*A*i^3/g/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c) \\
& ^3*a^3+1/2*e^2*d*B*i^3/g/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a*c^2-3*d*A*i^3/g/b^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)) \\
& *c^2*a-3*d^2*A*i^3/g/b^3*\ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^2*c+3*d*A*i^3/g/b^2*\ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e) \\
& *c^2*a+d^3*B*i^3/g/b^4*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*\ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e) \\
& *a^3+11/2*d^2*B*i^3/g/b^3*\ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^2*c+3*d^2*A*i^3/g/b^3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)) \\
& *a^2*c-11/2*d*B*i^3/g/b^2*\ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c^2*a+3/2*d^2*B*i^3/g/b^3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)) \\
& ^2*a^2*c+1/2*e^2*B*i^3/g*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c) \\
& ^2*c^3*b+e*B*i^3/g*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c) \\
& *c^4/(d*x+c)^3/2*d*B*i^3/g/b^2*\ln(b*e/d+(a*d-b*c)*e
\end{aligned}$$

$$\frac{1}{d(d*x+c)^2*c^2*a-3*d^2*B*i^3/g/b^3*\text{dilog}(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c)) - b*e)/b/e)*a^2*c-1/3*e^3*B*i^3/g*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^3*b^2-3/2*e^2*d*A*i^3/g/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^2*a+1/6*e^2*d^3*B*i^3/g/b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3-e^3*d^2*A*i^3/g/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^2*c$$

**Maxima [B]** time = 1.58277, size = 1148, normalized size = 3.22

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g),x, algorithm="maxima")

[Out]  $3*A*c^2*d*i^3*(x/(b*g) - a*\log(b*x + a)/(b^2*g)) - 1/6*A*d^3*i^3*(6*a^3*\log(b*x + a)/(b^4*g) - (2*b^2*x^3 - 3*a*b*x^2 + 6*a^2*x)/(b^3*g)) + 3/2*A*c*d^2*i^3*(2*a^2*\log(b*x + a)/(b^3*g) + (b*x^2 - 2*a*x)/(b^2*g)) + A*c^3*i^3*\log(b*g*x + a*g)/(b*g) - 1/6*(11*b^2*c^3*i^3 - 15*a*b*c^2*d*i^3 + 6*a^2*c*d^2*i^3)*B*\log(d*x + c)/(b^3*g) + (b^3*c^3*i^3 - 3*a*b^2*c^2*d*i^3 + 3*a^2*b*c*d^2*i^3 - a^3*d^3*i^3)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + \text{dilog}(-(b*d*x + a*d)/(b*c - a*d)))*B/(b^4*g) + 1/6*(2*B*b^3*d^3*i^3*x^3*\log(e) + ((9*i^3*\log(e) - i^3)*b^3*c*d^2 - (3*i^3*\log(e) - i^3)*a*b^2*d^3)*B*x^2 + 3*(b^3*c^3*i^3 - 3*a*b^2*c^2*d*i^3 + 3*a^2*b*c*d^2*i^3 - a^3*d^3*i^3)*B*\log(b*x + a)^2 + ((18*i^3*\log(e) - 7*i^3)*b^3*c^2*d - 6*(3*i^3*\log(e) - 2*i^3)*a*b^2*c*d^2 + (6*i^3*\log(e) - 5*i^3)*a^2*b*d^3)*B*x + (2*B*b^3*d^3*i^3*x^3 + 3*(3*b^3*c*d^2*i^3 - a*b^2*d^3*i^3)*B*x^2 + 6*(3*b^3*c^2*d*i^3 - 3*a*b^2*c*d^2*i^3 + a^2*b*d^3*i^3)*B*x + (6*b^3*c^3*i^3*\log(e) - 18*(i^3*\log(e) - i^3)*a*b^2*c^2*d + 9*(2*i^3*\log(e) - 3*i^3)*a^2*b*c*d^2 - (6*i^3*\log(e) - 11*i^3)*a^3*d^3)*B)*\log(b*x + a) - (2*B*b^3*d^3*i^3*x^3 + 3*(3*b^3*c*d^2*i^3 - a*b^2*d^3*i^3)*B*x^2 + 6*(3*b^3*c^2*d*i^3 - 3*a*b^2*c*d^2*i^3 + a^2*b*d^3*i^3)*B*x + 6*(b^3*c^3*i^3 - 3*a*b^2*c^2*d*i^3 + 3*a^2*b*c*d^2*i^3 - a^3*d^3*i^3)*B*\log(b*x + a))*\log(d*x + c))/(b^4*g)$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{Ad^3i^3x^3 + 3Acd^2i^3x^2 + 3Ac^2di^3x + Ac^3i^3 + (Bd^3i^3x^3 + 3Bcd^2i^3x^2 + 3Bc^2di^3x + Bc^3i^3) \log\left(\frac{bex+ae}{dx+c}\right)}{bgx + ag}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.



```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g),x, algorithm="fricas")
```

```
[Out] integral((A*d^3*i^3*x^3 + 3*A*c*d^2*i^3*x^2 + 3*A*c^2*d*i^3*x + A*c^3*i^3 + (B*d^3*i^3*x^3 + 3*B*c*d^2*i^3*x^2 + 3*B*c^2*d*i^3*x + B*c^3*i^3)*log((b*e*x + a*e)/(d*x + c)))/(b*g*x + a*g), x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g),x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3 \left( B \log \left( \frac{(bx+a)e}{dx+c} \right) + A \right)}{bgx + ag} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g),x, algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log((b*x + a)*e/(d*x + c)) + A)/(b*g*x + a*g), x)
```

$$3.25 \quad \int \frac{(ci+dx)^3 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{(ag+bgx)^2} dx$$

**Optimal.** Leaf size=373

$$\frac{3Bdi^3(bc-ad)^2 \text{PolyLog}\left(2, \frac{b(c+dx)}{d(a+bx)}\right)}{b^4g^2} + \frac{2d^2i^3(a+bx)(bc-ad) \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{b^4g^2} + \frac{di^3(c+dx)^2 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{2b^2g^2}$$

[Out]  $-(B*d^2*(b*c - a*d)*i^3*x)/(2*b^3*g^2) - (B*(b*c - a*d)^2*i^3*(c + d*x))/(b^3*g^2*(a + b*x)) - (B*d*(b*c - a*d)^2*i^3*\text{Log}[(a + b*x)/(c + d*x)]/(2*b^4*g^2) + (2*d^2*(b*c - a*d)*i^3*(a + b*x)*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(b^4*g^2) - ((b*c - a*d)^2*i^3*(c + d*x)*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(b^3*g^2*(a + b*x)) + (d*i^3*(c + d*x)^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(2*b^2*g^2) - (5*B*d*(b*c - a*d)^2*i^3*\text{Log}[c + d*x]/(2*b^4*g^2) - (3*d*(b*c - a*d)^2*i^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])*\text{Log}[1 - (b*(c + d*x))/(d*(a + b*x))]/(b^4*g^2) + (3*B*d*(b*c - a*d)^2*i^3*\text{PolyLog}[2, (b*(c + d*x))/(d*(a + b*x))]/(b^4*g^2)$

**Rubi [A]** time = 0.695625, antiderivative size = 521, normalized size of antiderivative = 1.4, number of steps used = 22, number of rules used = 14, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.35$ , Rules used = {2528, 2486, 31, 2525, 12, 72, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{3Bdi^3(bc-ad)^2 \text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{b^4g^2} - \frac{a^2Bd^3i^3 \log(a+bx)}{2b^4g^2} + \frac{d^3i^3x^2 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{2b^2g^2} + \frac{3di^3(bc-ad)^2 \log(a+bx)}{b^4g^2}$$

Antiderivative was successfully verified.

[In] Int[((c\*i + d\*i\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]]))/(a\*g + b\*g\*x)^2, x]

[Out]  $(A*d^2*(3*b*c - 2*a*d)*i^3*x)/(b^3*g^2) - (B*d^2*(b*c - a*d)*i^3*x)/(2*b^3*g^2) - (B*(b*c - a*d)^3*i^3)/(b^4*g^2*(a + b*x)) - (a^2*B*d^3*i^3*\text{Log}[a + b*x]/(2*b^4*g^2) - (B*d*(b*c - a*d)^2*i^3*\text{Log}[a + b*x]/(b^4*g^2) - (3*B*d*(b*c - a*d)^2*i^3*\text{Log}[a + b*x]^2)/(2*b^4*g^2) + (B*d^2*(3*b*c - 2*a*d)*i^3*(a + b*x)*\text{Log}[(e*(a + b*x))/(c + d*x)]/(b^4*g^2) + (d^3*i^3*x^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(2*b^2*g^2) - ((b*c - a*d)^3*i^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(b^4*g^2*(a + b*x)) + (3*d*(b*c - a*d)^2*i^3*\text{Log}[a + b*x]*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(b^4*g^2) + (B*c^2*d*i^3*\text{Log}[c + d*x]/(2*b^2*g^2) - (B*d*(3*b*c - 2*a*d)*(b*c - a*d)*i^3*\text{Log}[c + d*x]/($

$$b^4 g^2 + (B d (b c - a d)^{2i-3} \text{Log}[c + d x]) / (b^4 g^2) + (3 B d (b c - a d)^{2i-3} \text{Log}[a + b x] \text{Log}[(b(c + d x)) / (b c - a d)]) / (b^4 g^2) + (3 B d (b c - a d)^{2i-3} \text{PolyLog}[2, -(d(a + b x)) / (b c - a d)]) / (b^4 g^2)$$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q]^r]^s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

### Rule 31

```
Int[((a_) + (b_.)*(x_))^(n_), x_Symbol] := Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
x_Symbol] := Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
/; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 44

```
Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_) + Log[(c_)*(RFx_)^(p_)])*(b_)^(n_)/((d_) + (e_)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_))^(n_)])*(b_)^(p_)*(RFx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_))^(n_)])*(b_)^(p_)*((f_) + (g_
)*(x_))^(q_), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_) + Log[(c_)*(x_)^(n_)])*(b_)/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_))^(n_)])*(b_)/((f_) + (g_)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_))])*(b_)/((f_) + (g_)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
```

$(e*f - d*g), 0]$

### Rule 2391

$\text{Int}[\text{Log}[(c\_.)*((d\_)+(e\_)*(x\_)^{(n\_)})]/(x\_), x\_Symbol] :> -\text{Simp}[\text{PolyLog}[2, -(c*e*x^n)]/n, x] /; \text{FreeQ}\{c, d, e, n, x\} \ \&\& \ \text{EqQ}[c*d, 1]$

### Rubi steps

$$\begin{aligned}
 \int \frac{(25c + 25dx)^3 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{(ag + bgx)^2} dx &= \int \left( \frac{15625d^2(3bc - 2ad) \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{b^3g^2} + \frac{15625d^3x \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{b^2g^2} \right) dx \\
 &= \frac{(15625d^3) \int x \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right) dx}{b^2g^2} + \frac{(15625d^2(3bc - 2ad)) \int \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right) dx}{b^3g^2} \\
 &= \frac{15625Ad^2(3bc - 2ad)x}{b^3g^2} + \frac{15625d^3x^2 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{2b^2g^2} - \frac{15625(bc - ad)x \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{b^4g^2} \\
 &= \frac{15625Ad^2(3bc - 2ad)x}{b^3g^2} + \frac{15625Bd^2(3bc - 2ad)(a + bx) \log\left(\frac{e(a+bx)}{c+dx}\right)}{b^4g^2} + \frac{15625Bd^2(3bc - 2ad)(a + bx) \log\left(\frac{e(a+bx)}{c+dx}\right)}{b^4g^2} \\
 &= \frac{15625Ad^2(3bc - 2ad)x}{b^3g^2} + \frac{15625Bd^2(3bc - 2ad)(a + bx) \log\left(\frac{e(a+bx)}{c+dx}\right)}{b^4g^2} + \frac{15625Bd^2(3bc - 2ad)(a + bx) \log\left(\frac{e(a+bx)}{c+dx}\right)}{b^4g^2} \\
 &= \frac{15625Ad^2(3bc - 2ad)x}{b^3g^2} - \frac{15625Bd^2(bc - ad)x}{2b^3g^2} - \frac{15625B(bc - ad)^3}{b^4g^2(a + bx)} - \frac{15625B(bc - ad)^3}{b^4g^2(a + bx)} \\
 &= \frac{15625Ad^2(3bc - 2ad)x}{b^3g^2} - \frac{15625Bd^2(bc - ad)x}{2b^3g^2} - \frac{15625B(bc - ad)^3}{b^4g^2(a + bx)} - \frac{15625B(bc - ad)^3}{b^4g^2(a + bx)} \\
 &= \frac{15625Ad^2(3bc - 2ad)x}{b^3g^2} - \frac{15625Bd^2(bc - ad)x}{2b^3g^2} - \frac{15625B(bc - ad)^3}{b^4g^2(a + bx)} - \frac{15625B(bc - ad)^3}{b^4g^2(a + bx)} \\
 &= \frac{15625Ad^2(3bc - 2ad)x}{b^3g^2} - \frac{15625Bd^2(bc - ad)x}{2b^3g^2} - \frac{15625B(bc - ad)^3}{b^4g^2(a + bx)} - \frac{15625B(bc - ad)^3}{b^4g^2(a + bx)}
 \end{aligned}$$

**Mathematica [A]** time = 0.406583, size = 374, normalized size = 1.

$$i^3 \left( -3Bd(bc - ad)^2 \left( \log(a + bx) \left( \log(a + bx) - 2 \log\left(\frac{b(c+dx)}{bc-ad}\right) \right) - 2 \text{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) \right) - a^2 B d^3 \log(a + bx) + b^2 d^3 x^2 \left( B \right. \right.$$

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(a\*g + b\*g\*x)^2,x]

[Out] (i^3\*(2\*A\*b\*d^2\*(3\*b\*c - 2\*a\*d)\*x - b\*B\*d^2\*(b\*c - a\*d)\*x - (2\*B\*(b\*c - a\*d)^3)/(a + b\*x) - a^2\*B\*d^3\*Log[a + b\*x] - 2\*B\*d\*(b\*c - a\*d)^2\*Log[a + b\*x] + 2\*B\*d^2\*(3\*b\*c - 2\*a\*d)\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x)] + b^2\*d^3\*x^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) - (2\*(b\*c - a\*d)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(a + b\*x) + 6\*d\*(b\*c - a\*d)^2\*Log[a + b\*x]\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)] + b^2\*B\*c^2\*d\*Log[c + d\*x] + 2\*B\*d\*(b\*c - a\*d)^2\*Log[c + d\*x] - 2\*B\*d\*(-(b\*c) + a\*d)\*(-3\*b\*c + 2\*a\*d)\*Log[c + d\*x] - 3\*B\*d\*(b\*c - a\*d)^2\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d)])) - 2\*PolyLog[2, (d\*(a + b\*x))/(-(b\*c) + a\*d)]))/(2\*b^4\*g^2)

**Maple [B]** time = 0.179, size = 3141, normalized size = 8.4

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*i\*x+c\*i)^3\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)^2,x)

[Out] -3\*d\*B\*i^3/g^2/b^2\*dilog(-(d\*(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))-b\*e)/b/e)\*c^2-e\*B\*i^3/g^2/b/(b\*e/d+e/(d\*x+c)\*a-e/d/(d\*x+c)\*b\*c)\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))\*c^2-3\*d^3\*B\*i^3/g^2/b^4\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))\*ln(-(d\*(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))-b\*e)/b/e)\*a^2+6\*d^2\*A\*i^3/g^2/b^3\*ln(d\*(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))-b\*e)\*a\*c+1/2\*e^2\*d^3\*A\*i^3/g^2/b^2/(d\*e/(d\*x+c)\*a-e/(d\*x+c)\*b\*c)^2\*a^2-e\*d^2\*B\*i^3/g^2/b^3/(b\*e/d+e/(d\*x+c)\*a-e/d/(d\*x+c)\*b\*c)\*a^2+6\*e\*d^3\*B\*i^3/g^2/b^3\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))/(d\*e/(d\*x+c)\*a-e/(d\*x+c)\*b\*c)\*a^2/(d\*x+c)\*c-6\*e\*d^2\*B\*i^3/g^2/b^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))/(d\*e/(d\*x+c)\*a-e/(d\*x+c)\*b\*c)\*c^2/(d\*x+c)\*a+2\*e^2\*d^2\*B\*i^3/g^2/b\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))/(d\*e/(d\*x+c)\*a-e/(d\*x+c)\*b\*c)^2\*c^3/(d\*x+c)^2\*a+2\*e^2\*d^4\*B\*i^3/g^2/b^3\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))/(d\*e/(d\*x+c)\*a-e/(d\*x+c)\*b\*c)^2\*a^3/(d\*x+c)^2\*c-e\*d^2\*B\*i^3/g^2/b^2/(d\*e/(d\*x+c)\*a-e/(d\*x+c)\*b\*c)\*

$$\begin{aligned}
& a*c+1/2*e^2*d^3*B*i^3/g^2/b^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)* \\
& a-e/(d*x+c)*b*c)^2*a^2+1/2*e^2*d*A*i^3/g^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2* \\
& c^2+3*d*A*i^3/g^2/b^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c^2-3*d^3*B*i^3/g^2/b \\
& ^4*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a^2+3/2*d^3*B*i^3/g^2/ \\
& b^4*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a^2+3/2*d*B*i^3/g^2/b^2*\ln(b*e/d+(a*d \\
& -b*c)*e/d/(d*x+c))^2*c^2-3*d*A*i^3/g^2/b^2*\ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c) \\
& ))-b*e)*c^2+5/2*d^3*B*i^3/g^2/b^4*\ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a \\
& ^2+5/2*d*B*i^3/g^2/b^2*\ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c^2-3*d^3*A \\
& i^3/g^2/b^4*\ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^2-e*B*i^3/g^2/b/(b*e/ \\
& d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c^2-e*A*i^3/g^2/b/(b*e/d+e/(d*x+c)*a-e/d/(d \\
& x+c)*b*c)*c^2-e^2*d^2*B*i^3/g^2/b*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x \\
& +c)*a-e/(d*x+c)*b*c)^2*a*c+1/2*e*d^3*B*i^3/g^2/b^3/(d*e/(d*x+c)*a-e/(d*x+c) \\
& *b*c)*a^2+3*d^3*A*i^3/g^2/b^4*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a^2-e^2*d^2*A \\
& i^3/g^2/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a*c-1/2*e^2*d*B*i^3/g^2*\ln(b*e/d \\
& +(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^4/(d*x+c)^2-e*d^2 \\
& *B*i^3/g^2/b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*\ln(b*e/d+(a*d-b*c)*e/d/( \\
& d*x+c))*a^2-2*e*d^3*B*i^3/g^2/b^3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x \\
& +c)*a-e/(d*x+c)*b*c)*a^2-2*e*d*B*i^3/g^2/b*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/ \\
& (d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^2+6*d^2*B*i^3/g^2/b^3*\ln(b*e/d+(a*d-b*c)*e/ \\
& d/(d*x+c))*\ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a*c+4*e*d^2*A*i^3 \\
& /g^2/b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a*c+2*e*d*A*i^3/g^2/b^2/(b*e/d+e/(d \\
& x+c)*a-e/d/(d*x+c)*b*c)*a*c+2*e*d*B*i^3/g^2/b^2/(b*e/d+e/(d*x+c)*a-e/d/(d \\
& x+c)*b*c)*a*c-3*e^2*d^3*B*i^3/g^2/b^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/( \\
& d*x+c)*a-e/(d*x+c)*b*c)^2*a^2/(d*x+c)^2*c^2-1/2*e^2*d^5*B*i^3/g^2/b^4*\ln(b \\
& e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^4/(d*x+c)^2+4* \\
& e*d^2*B*i^3/g^2/b^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c) \\
& )*b*c)*a*c-2*e*d^4*B*i^3/g^2/b^4*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+ \\
& c)*a-e/(d*x+c)*b*c)*a^3/(d*x+c)+2*e*d*B*i^3/g^2/b*\ln(b*e/d+(a*d-b*c)*e/d/(d \\
& *x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^3/(d*x+c)+2*e*d*B*i^3/g^2/b^2/(b*e/d \\
& +e/(d*x+c)*a-e/d/(d*x+c)*b*c)*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a*c+1/2*e*d*B \\
& i^3/g^2/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^2-e*d^2*A*i^3/g^2/b^3/(b*e/d+e/( \\
& d*x+c)*a-e/d/(d*x+c)*b*c)*a^2-2*e*d^3*A*i^3/g^2/b^3/(d*e/(d*x+c)*a-e/(d*x+c) \\
& )*b*c)*a^2-2*e*d*A*i^3/g^2/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^2-3*d*B*i^3/g^ \\
& 2/b^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*\ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))- \\
& b*e)/b/e)*c^2+6*d^2*B*i^3/g^2/b^3*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b \\
& *e)/b/e)*a*c-6*d^2*A*i^3/g^2/b^3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c*a+1/2*e^ \\
& 2*d*B*i^3/g^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c) \\
& ^2*c^2-3*d^2*B*i^3/g^2/b^3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a*c-5*d^2*B*i^ \\
& 3/g^2/b^3*\ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a*c
\end{aligned}$$


---

**Maxima [B]** time = 1.70177, size = 2026, normalized size = 5.43

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2,x, algorith="maxima")
```

```
[Out] -3*A*(a^2/(b^4*g^2*x + a*b^3*g^2) - x/(b^2*g^2) + 2*a*log(b*x + a)/(b^3*g^2))
*c*d^2*i^3 + 1/2*(2*a^3/(b^5*g^2*x + a*b^4*g^2) + 6*a^2*log(b*x + a)/(b^4*g^2) + (b*x^2 - 4*a*x)/(b^3*g^2))*A*d^3*i^3 + 3*A*c^2*d*i^3*(a/(b^3*g^2*x + a*b^2*g^2) + log(b*x + a)/(b^2*g^2)) - B*c^3*i^3*(log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^2*g^2*x + a*b*g^2) + 1/(b^2*g^2*x + a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)*g^2) - d*log(d*x + c)/((b^2*c - a*b*d)*g^2)) - A*c^3*i^3/(b^2*g^2*x + a*b*g^2) - 1/2*(5*b^3*c^3*d*i^3 - 3*a*b^2*c^2*d^2*i^3 - 2*a^2*b*c*d^3*i^3 + 2*a^3*d^4*i^3)*B*log(d*x + c)/(b^5*c*g^2 - a*b^4*d*g^2) + 1/2*((b^4*c*d^3*i^3*log(e) - a*b^3*d^4*i^3*log(e))*B*x^3 + ((6*i^3*log(e) - i^3)*b^4*c^2*d^2 - (9*i^3*log(e) - 2*i^3)*a*b^3*c*d^3 + (3*i^3*log(e) - i^3)*a^2*b^2*d^4)*B*x^2 + ((6*i^3*log(e) - i^3)*a*b^3*c^2*d^2 - 2*(5*i^3*log(e) - i^3)*a^2*b^2*c*d^3 + (4*i^3*log(e) - i^3)*a^3*b*d^4)*B*x + 3*((b^4*c^3*d*i^3 - 3*a*b^3*c^2*d^2*i^3 + 3*a^2*b^2*c*d^3*i^3 - a^3*b*d^4*i^3)*B*x + (a*b^3*c^3*d*i^3 - 3*a^2*b^2*c^2*d^2*i^3 + 3*a^3*b*c*d^3*i^3 - a^4*d^4*i^3)*B)*log(b*x + a)^2 + 2*(3*(i^3*log(e) + i^3)*a*b^3*c^3*d - 6*(i^3*log(e) + i^3)*a^2*b^2*c^2*d^2 + 4*(i^3*log(e) + i^3)*a^3*b*c*d^3 - (i^3*log(e) + i^3)*a^4*d^4)*B + ((b^4*c*d^3*i^3 - a*b^3*d^4*i^3)*B*x^3 + 3*(2*b^4*c^2*d^2*i^3 - 3*a*b^3*c*d^3*i^3 + a^2*b^2*d^4*i^3)*B*x^2 + (6*b^4*c^3*d*i^3*log(e) - 18*(i^3*log(e) - i^3)*a*b^3*c^2*d^2 + 9*(2*i^3*log(e) - 3*i^3)*a^2*b^2*c*d^3 - (6*i^3*log(e) - 11*i^3)*a^3*b*d^4)*B*x - (18*a^2*b^2*c^2*d^2*i^3*log(e) - 6*(i^3*log(e) + i^3)*a*b^3*c^3*d - 9*(2*i^3*log(e) - i^3)*a^3*b*c*d^3 + (6*i^3*log(e) - 5*i^3)*a^4*d^4)*B)*log(b*x + a) - ((b^4*c*d^3*i^3 - a*b^3*d^4*i^3)*B*x^3 + 3*(2*b^4*c^2*d^2*i^3 - 3*a*b^3*c*d^3*i^3 + a^2*b^2*d^4*i^3)*B*x^2 + 2*(3*a*b^3*c^2*d^2*i^3 - 5*a^2*b^2*c*d^3*i^3 + 2*a^3*b*d^4*i^3)*B*x + 2*(3*a*b^3*c^3*d*i^3 - 6*a^2*b^2*c^2*d^2*i^3 + 4*a^3*b*c*d^3*i^3 - a^4*d^4*i^3)*B + 6*((b^4*c^3*d*i^3 - 3*a*b^3*c^2*d^2*i^3 + 3*a^2*b^2*c*d^3*i^3 - a^3*b*d^4*i^3)*B*x + (a*b^3*c^3*d*i^3 - 3*a^2*b^2*c^2*d^2*i^3 + 3*a^3*b*c*d^3*i^3 - a^4*d^4*i^3)*B)*log(b*x + a))*log(d*x + c))/(a*b^5*c*g^2 - a^2*b^4*d*g^2 + (b^6*c*g^2 - a*b^5*d*g^2)*x) + 3*(b^2*c^2*d*i^3 - 2*a*b*c*d^2*i^3 + a^2*d^3*i^3)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B/(b^4*g^2)
```

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{Ad^3i^3x^3 + 3Acd^2i^3x^2 + 3Ac^2di^3x + Ac^3i^3 + (Bd^3i^3x^3 + 3Bcd^2i^3x^2 + 3Bc^2di^3x + Bc^3i^3) \log\left(\frac{bex+ae}{dx+c}\right)}{b^2g^2x^2 + 2abg^2x + a^2g^2}, x \right)$$



Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2,x, algorithm="fricas")
```

```
[Out] integral((A*d^3*i^3*x^3 + 3*A*c*d^2*i^3*x^2 + 3*A*c^2*d*i^3*x + A*c^3*i^3 + (B*d^3*i^3*x^3 + 3*B*c*d^2*i^3*x^2 + 3*B*c^2*d*i^3*x + B*c^3*i^3)*log((b*e*x + a*e)/(d*x + c)))/(b^2*g^2*x^2 + 2*a*b*g^2*x + a^2*g^2), x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**2,x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3 \left( B \log\left(\frac{(bx+a)e}{dx+c}\right) + A \right)}{(bgx + ag)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2,x, algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log((b*x + a)*e/(d*x + c)) + A)/(b*g*x + a*g)^2, x)
```

$$3.26 \quad \int \frac{(ci+dx)^3 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{(ag+bgx)^3} dx$$

**Optimal.** Leaf size=345

$$\frac{3Bd^2i^3(bc-ad)\text{PolyLog}\left(2, \frac{b(c+dx)}{d(a+bx)}\right)}{b^4g^3} + \frac{d^3i^3(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{b^4g^3} - \frac{3d^2i^3(bc-ad)\log\left(1 - \frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^4g^3}$$

[Out]  $(-2*B*d*(b*c - a*d)*i^3*(c + d*x))/(b^3*g^3*(a + b*x)) - (B*(b*c - a*d)*i^3*(c + d*x)^2)/(4*b^2*g^3*(a + b*x)^2) + (d^3*i^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^4*g^3) - (2*d*(b*c - a*d)*i^3*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^3*g^3*(a + b*x)) - ((b*c - a*d)*i^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*b^2*g^3*(a + b*x)^2) - (B*d^2*(b*c - a*d)*i^3*Log[c + d*x]/(b^4*g^3) - (3*d^2*(b*c - a*d)*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]*Log[1 - (b*(c + d*x))/(d*(a + b*x)]))/(b^4*g^3) + (3*B*d^2*(b*c - a*d)*i^3*PolyLog[2, (b*(c + d*x))/(d*(a + b*x)]))/(b^4*g^3)$

**Rubi [A]** time = 0.717528, antiderivative size = 442, normalized size of antiderivative = 1.28, number of steps used = 22, number of rules used = 13, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.325$ , Rules used = {2528, 2486, 31, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{3Bd^2i^3(bc-ad)\text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{b^4g^3} + \frac{3d^2i^3(bc-ad)\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{b^4g^3} - \frac{3di^3(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^4g^3(a+bx)}$$

Antiderivative was successfully verified.

[In] Int[((c\*i + d\*i\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(a\*g + b\*g\*x)^3, x]

[Out]  $(A*d^3*i^3*x)/(b^3*g^3) - (B*(b*c - a*d)^3*i^3)/(4*b^4*g^3*(a + b*x)^2) - (5*B*d*(b*c - a*d)^2*i^3)/(2*b^4*g^3*(a + b*x)) - (5*B*d^2*(b*c - a*d)*i^3*Log[a + b*x]/(2*b^4*g^3) - (3*B*d^2*(b*c - a*d)*i^3*Log[a + b*x]^2)/(2*b^4*g^3) + (B*d^3*i^3*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)]/(b^4*g^3) - ((b*c - a*d)^3*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*b^4*g^3*(a + b*x)^2) - (3*d*(b*c - a*d)^2*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^4*g^3*(a + b*x)) + (3*d^2*(b*c - a*d)*i^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^4*g^3) + (3*B*d^2*(b*c - a*d)*i^3*Log[c + d*x]/(2*b^4*g^3) + (3*B*d^2*(b*c - a*d)*i^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)]/(b^4*g^3) + (3*B*d^2*(b*c - a*d)*i^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d)]))/(b^4*g^3)$

$b^4 g^3$ )

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*RFX^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFX, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q]^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

### Rule 31

```
Int[((a_) + (b_.)*(x_))^-1, x_Symbol] := Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol]
:> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e,
Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol]
:> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)
*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x],
x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)),
x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n]))/g, x] -
Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))])*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol]
:> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]/(x_), x_Symbol] :> -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rubi steps

$$\begin{aligned}
\int \frac{(26c + 26dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{(ag + bgx)^3} dx &= \int \left( \frac{17576d^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3g^3} + \frac{17576(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3g^3(a + bx)^3} \right) dx \\
&= \frac{(17576d^3) \int \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) dx}{b^3g^3} + \frac{(52728d^2(bc - ad)) \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{a+bx}}{b^3g^3} \\
&= \frac{17576Ad^3x}{b^3g^3} - \frac{8788(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^4g^3(a + bx)^2} - \frac{52728d(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^4g^3(a + bx)} \\
&= \frac{17576Ad^3x}{b^3g^3} + \frac{17576Bd^3(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^4g^3} - \frac{8788(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^4g^3(a + bx)^2} \\
&= \frac{17576Ad^3x}{b^3g^3} + \frac{17576Bd^3(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^4g^3} - \frac{8788(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^4g^3(a + bx)^2} \\
&= \frac{17576Ad^3x}{b^3g^3} - \frac{4394B(bc - ad)^3}{b^4g^3(a + bx)^2} - \frac{43940Bd(bc - ad)^2}{b^4g^3(a + bx)} - \frac{43940Bd^2(bc - ad)}{b^4g^3} \\
&= \frac{17576Ad^3x}{b^3g^3} - \frac{4394B(bc - ad)^3}{b^4g^3(a + bx)^2} - \frac{43940Bd(bc - ad)^2}{b^4g^3(a + bx)} - \frac{43940Bd^2(bc - ad)}{b^4g^3} \\
&= \frac{17576Ad^3x}{b^3g^3} - \frac{4394B(bc - ad)^3}{b^4g^3(a + bx)^2} - \frac{43940Bd(bc - ad)^2}{b^4g^3(a + bx)} - \frac{43940Bd^2(bc - ad)}{b^4g^3} \\
&= \frac{17576Ad^3x}{b^3g^3} - \frac{4394B(bc - ad)^3}{b^4g^3(a + bx)^2} - \frac{43940Bd(bc - ad)^2}{b^4g^3(a + bx)} - \frac{43940Bd^2(bc - ad)}{b^4g^3}
\end{aligned}$$

**Mathematica [A]** time = 0.439761, size = 314, normalized size = 0.91

$$i^3 \left( 6Bd^2(ad - bc) \left( \log(a + bx) \left( \log(a + bx) - 2 \log \left( \frac{b(c+dx)}{bc-ad} \right) \right) - 2 \text{PolyLog} \left( 2, \frac{d(a+bx)}{ad-bc} \right) \right) + 12d^2(bc - ad) \log(a + bx) \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) \right)$$

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])))/(a\*g + b\*g\*x)^3,x]

```
[Out] (i^3*(4*A*b*d^3*x - (B*(b*c - a*d)^3)/(a + b*x)^2 - (10*B*d*(b*c - a*d)^2)/
(a + b*x) + 10*B*d^2*(-(b*c) + a*d)*Log[a + b*x] + 4*B*d^3*(a + b*x)*Log[(e
*(a + b*x))/(c + d*x)] - (2*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x
)])))/(a + b*x)^2 - (12*d*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]
)/(a + b*x) + 12*d^2*(b*c - a*d)*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c +
d*x])) + 6*B*d^2*(b*c - a*d)*Log[c + d*x] + 6*B*d^2*(-(b*c) + a*d)*(Log[a
+ b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*
(a + b*x))/(-(b*c) + a*d)])))/(4*b^4*g^3)
```

---

**Maple [B]** time = 0.164, size = 1855, normalized size = 5.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3,x)
```

```
[Out] e*d^4*i^3/g^3*B/b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)
)*b*c)/(d*x+c)*a^2+e*d^2*i^3/g^3*B/b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e
/(d*x+c)*a-e/(d*x+c)*b*c)/(d*x+c)*c^2+1/4*e^2*d*i^3/g^3*B/b^2/(b*e/d+e/(d*x
+c)*a-e/d/(d*x+c)*b*c)^2*a+2*e*d^2*i^3/g^3*A/b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*
x+c)*b*c)*a-1/2*e^2*i^3/g^3*B/b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*
e/d+(a*d-b*c)*e/d/(d*x+c))*c+3*d^3*i^3/g^3*B/b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*
x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a-3*d^2*i^3/g^3*B/b^3*
ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b
/e)*c-2*e*d*i^3/g^3*A/b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c+e*d^3*i^3/g
^3*A/b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a-e*d^2*i^3/g^3*A/b^2/(d*e/(d*x+c)*a
-e/(d*x+c)*b*c)*c+2*e*d^2*i^3/g^3*B/b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)
*a-2*e*d*i^3/g^3*B/b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c+1/2*e^2*d*i^3/
g^3*A/b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a-2*e*d^3*i^3/g^3*B/b^3*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)/(d*x+c)*a*c-3*d^
3*i^3/g^3*A/b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+3*d^2*i^3/g^3*A/b^3*ln(b*
e/d+(a*d-b*c)*e/d/(d*x+c))*c+e*d^3*i^3/g^3*B/b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*
x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a-e*d^2*i^3/g^3*B/b^2*ln(b*e/d+(a*d-b*c)
)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c+2*e*d^2*i^3/g^3*B/b^3/(b*e/d
+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-2*e*d*i^3/g
^3*B/b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)*c+1/2*e^2*d*i^3/g^3*B/b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+
(a*d-b*c)*e/d/(d*x+c))*a-3*d^2*i^3/g^3*B/b^3*dilog(-(d*(b*e/d+(a*d-b*c)*e/d
/(d*x+c))-b*e)/b/e)*c-d^3*i^3/g^3*B/b^4*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-
b*e)*a+d^2*i^3/g^3*B/b^3*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c-1/4*e^2*
i^3/g^3*B/b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c-1/2*e^2*i^3/g^3*A/b/(b
```

$$\frac{e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^{2*c+3*d^3*i^3/g^3*A/b^4*\ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a-3*d^2*i^3/g^3*A/b^3*\ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c-3/2*d^3*i^3/g^3*B/b^4*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^{2*a+3/2*d^2*i^3/g^3*B/b^3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^{2*c+3*d^3*i^3/g^3*B/b^4*d\log(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a$$

**Maxima [B]** time = 1.88724, size = 3108, normalized size = 9.01

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3,x, algorith="maxima")
```

```
[Out] -3/4*B*c^2*d*i^3*(2*(2*b*x + a)*log(b*e*x/(d*x + c) + a*e/(d*x + c)))/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) + (3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*d)*x)/((b^5*c - a*b^4*d)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)*g^3) + 2*(2*b*c*d - a*d^2)*log(b*x + a)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3) - 2*(2*b*c*d - a*d^2)*log(d*x + c)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3) - 1/2*A*d^3*i^3*((6*a^2*b*x + 5*a^3)/(b^6*g^3*x^2 + 2*a*b^5*g^3*x + a^2*b^4*g^3) - 2*x/(b^3*g^3) + 6*a*log(b*x + a)/(b^4*g^3)) + 3/2*A*c*d^2*i^3*((4*a*b*x + 3*a^2)/(b^5*g^3*x^2 + 2*a*b^4*g^3*x + a^2*b^3*g^3) + 2*log(b*x + a)/(b^3*g^3)) + 1/4*B*c^3*i^3*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) - 2*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) + 2*d^2*log(b*x + a)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 3/2*(2*b*x + a)*A*c^2*d*i^3/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) - 1/2*A*c^3*i^3/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) - 1/2*(2*b^3*c^3*d^2*i^3 + 8*a*b^2*c^2*d^3*i^3 - 13*a^2*b*c*d^4*i^3 + 5*a^3*d^5*i^3)*B*log(d*x + c)/(b^6*c^2*g^3 - 2*a*b^5*c*d*g^3 + a^2*b^4*d^2*g^3) + 1/4*(4*(b^5*c^2*d^3*i^3*log(e) - 2*a*b^4*c*d^4*i^3*log(e) + a^2*b^3*d^5*i^3*log(e))*B*x^3 + 8*(a*b^4*c^2*d^3*i^3*log(e) - 2*a^2*b^3*c*d^4*i^3*log(e) + a^3*b^2*d^5*i^3*log(e))*B*x^2 + 2*(12*(i^3*log(e) + i^3)*a*b^4*c^3*d^2 - (28*i^3*log(e) + 27*i^3)*a^2*b^3*c^2*d^3 + 20*(i^3*log(e) + i^3)*a^3*b^2*c*d^4 - (4*i^3*log(e) + 5*i^3)*a^4*b*d^5)*B*x + 6*((b^5*c^3*d^2*i^3 - 3*a*b^4*c^2*d^3*i^3 + 3*a^2*b^3*c*d^4*i^3 - a^3*b^2*d^5*i^3)*B*x^2 + 2*(a*b^4*c^3*d^2*i^3 - 3*a^2*b^3*c^2*d^3*i^3 + 3*a^3*b^2*c*d^4*i^3 - a^4*b*d^5*i^3)*B*x + (a^2*b^3*c^3*d^2*i^3 - 3*a^3*b^2*c^2*d^3*i^3 + 3*a^4*b*c*d^4*i^3 - a^5*d^5*i^3)*B)*log(b*x + a)^2 + (3*(6*i^3*log(e) + 7*i^3)*a^2*b^3*c^3*d^2 - (46*i^3*log(e) + 47*i^3)*a^3*b^2*c^2*d^3 + (38*i^3*log(e) + 35*i^3)*a^4*b*c*d^4 - (10*i^3*
```

```

log(e) + 9*i^3*a^5*d^5)*B + 2*(2*(b^5*c^2*d^3*i^3 - 2*a*b^4*c*d^4*i^3 + a^
2*b^3*d^5*i^3)*B*x^3 + (6*b^5*c^3*d^2*i^3*log(e) - 18*(i^3*log(e) - i^3)*a*
b^4*c^2*d^3 + 9*(2*i^3*log(e) - 3*i^3)*a^2*b^3*c*d^4 - (6*i^3*log(e) - 11*i
^3)*a^3*b^2*d^5)*B*x^2 - 2*(18*a^2*b^3*c^2*d^3*i^3*log(e) - 6*(i^3*log(e) +
i^3)*a*b^4*c^3*d^2 - 9*(2*i^3*log(e) - i^3)*a^3*b^2*c*d^4 + (6*i^3*log(e)
- 5*i^3)*a^4*b*d^5)*B*x + (18*a^4*b*c*d^4*i^3*log(e) + 3*(2*i^3*log(e) + 3*
i^3)*a^2*b^3*c^3*d^2 - 9*(2*i^3*log(e) + i^3)*a^3*b^2*c^2*d^3 - 2*(3*i^3*lo
g(e) - i^3)*a^5*d^5)*B)*log(b*x + a) - 2*(2*(b^5*c^2*d^3*i^3 - 2*a*b^4*c*d^
4*i^3 + a^2*b^3*d^5*i^3)*B*x^3 + 4*(a*b^4*c^2*d^3*i^3 - 2*a^2*b^3*c*d^4*i^3
+ a^3*b^2*d^5*i^3)*B*x^2 + 4*(3*a*b^4*c^3*d^2*i^3 - 7*a^2*b^3*c^2*d^3*i^3
+ 5*a^3*b^2*c*d^4*i^3 - a^4*b*d^5*i^3)*B*x + (9*a^2*b^3*c^3*d^2*i^3 - 23*a^
3*b^2*c^2*d^3*i^3 + 19*a^4*b*c*d^4*i^3 - 5*a^5*d^5*i^3)*B + 6*((b^5*c^3*d^2
*i^3 - 3*a*b^4*c^2*d^3*i^3 + 3*a^2*b^3*c*d^4*i^3 - a^3*b^2*d^5*i^3)*B*x^2 +
2*(a*b^4*c^3*d^2*i^3 - 3*a^2*b^3*c^2*d^3*i^3 + 3*a^3*b^2*c*d^4*i^3 - a^4*b
*d^5*i^3)*B*x + (a^2*b^3*c^3*d^2*i^3 - 3*a^3*b^2*c^2*d^3*i^3 + 3*a^4*b*c*d^
4*i^3 - a^5*d^5*i^3)*B)*log(b*x + a))*log(d*x + c))/(a^2*b^6*c^2*g^3 - 2*a^
3*b^5*c*d*g^3 + a^4*b^4*d^2*g^3 + (b^8*c^2*g^3 - 2*a*b^7*c*d*g^3 + a^2*b^6*
d^2*g^3)*x^2 + 2*(a*b^7*c^2*g^3 - 2*a^2*b^6*c*d*g^3 + a^3*b^5*d^2*g^3)*x) +
3*(b*c*d^2*i^3 - a*d^3*i^3)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) +
1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B/(b^4*g^3)

```

---

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{Ad^3i^3x^3 + 3Acd^2i^3x^2 + 3Ac^2di^3x + Ac^3i^3 + (Bd^3i^3x^3 + 3Bcd^2i^3x^2 + 3Bc^2di^3x + Bc^3i^3) \log\left(\frac{bex+ae}{dx+c}\right)}{b^3g^3x^3 + 3ab^2g^3x^2 + 3a^2bg^3x + a^3g^3}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```

[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3,x, algor
ithm="fricas")

```

```

[Out] integral((A*d^3*i^3*x^3 + 3*A*c*d^2*i^3*x^2 + 3*A*c^2*d*i^3*x + A*c^3*i^3 +
(B*d^3*i^3*x^3 + 3*B*c*d^2*i^3*x^2 + 3*B*c^2*d*i^3*x + B*c^3*i^3)*log((b*e
*x + a*e)/(d*x + c)))/(b^3*g^3*x^3 + 3*a*b^2*g^3*x^2 + 3*a^2*b*g^3*x + a^3*
g^3), x)

```

---

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out



Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**3,x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3 \left( B \log\left(\frac{(bx+a)e}{dx+c}\right) + A \right)}{(bgx + ag)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3,x, algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log((b*x + a)*e/(d*x + c)) + A)/(b*g*x + a*g)^3, x)
```

$$3.27 \quad \int \frac{(ci+dx)^3 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{(ag+bgx)^4} dx$$

**Optimal.** Leaf size=310

$$\frac{Bd^3i^3 \text{PolyLog}\left(2, \frac{b(c+dx)}{d(a+bx)}\right)}{b^4g^4} - \frac{d^2i^3(c+dx)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{b^3g^4(a+bx)} - \frac{d^3i^3 \log\left(1 - \frac{b(c+dx)}{d(a+bx)}\right)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{b^4g^4} - \frac{di^3(c+dx)}{2}$$

[Out]  $-\left(\frac{B*d^2*i^3*(c+d*x)}{(b^3*g^4*(a+b*x))}\right) - \left(\frac{B*d*i^3*(c+d*x)^2}{(4*b^2*g^4*(a+b*x)^2)} - \frac{B*i^3*(c+d*x)^3}{(9*b*g^4*(a+b*x)^3)} - \frac{(d^2*i^3*(c+d*x)*(A+B*\text{Log}[(e*(a+b*x))/(c+d*x])))}{(b^3*g^4*(a+b*x))} - \frac{(d*i^3*(c+d*x)^2*(A+B*\text{Log}[(e*(a+b*x))/(c+d*x])))}{(2*b^2*g^4*(a+b*x)^2)} - \frac{(i^3*(c+d*x)^3*(A+B*\text{Log}[(e*(a+b*x))/(c+d*x])))}{(3*b*g^4*(a+b*x)^3)} - \frac{(d^3*i^3*(A+B*\text{Log}[(e*(a+b*x))/(c+d*x)])*\text{Log}[1 - (b*(c+d*x))/(d*(a+b*x))]}{(b^4*g^4)} + \frac{(B*d^3*i^3*\text{PolyLog}[2, (b*(c+d*x))/(d*(a+b*x))]}{(b^4*g^4)}\right)$

**Rubi [A]** time = 0.781886, antiderivative size = 424, normalized size of antiderivative = 1.37, number of steps used = 23, number of rules used = 11, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.275$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{Bd^3i^3 \text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{b^4g^4} + \frac{d^3i^3 \log(a+bx)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{b^4g^4} - \frac{3d^2i^3(bc-ad)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{b^4g^4(a+bx)} - \frac{3di^3(bc-a)}{2}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[\left(\frac{(c*i + d*i*x)^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])}{(a*g + b*g*x)^4}, x\right]$

[Out]  $-\left(\frac{B*(b*c - a*d)^3*i^3}{(9*b^4*g^4*(a + b*x)^3)} - \frac{(7*B*d*(b*c - a*d)^2*i^3)}{(12*b^4*g^4*(a + b*x)^2)} - \frac{(11*B*d^2*(b*c - a*d)*i^3)}{(6*b^4*g^4*(a + b*x))} - \frac{(11*B*d^3*i^3*\text{Log}[a + b*x])}{(6*b^4*g^4)} - \frac{(B*d^3*i^3*\text{Log}[a + b*x]^2)}{(2*b^4*g^4)} - \frac{((b*c - a*d)^3*i^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x]))}{(3*b^4*g^4*(a + b*x)^3)} - \frac{(3*d*(b*c - a*d)^2*i^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x])]}{(2*b^4*g^4*(a + b*x)^2)} - \frac{(3*d^2*(b*c - a*d)*i^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x])]}{(b^4*g^4*(a + b*x))} + \frac{(d^3*i^3*\text{Log}[a + b*x]*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x])]}{(b^4*g^4)} + \frac{(11*B*d^3*i^3*\text{Log}[c + d*x])}{(6*b^4*g^4)} + \frac{(B*d^3*i^3*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)])}{(b^4*g^4)} + \frac{(B*d^3*i^3*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d)])}{(b^4*g^4)}\right)$

Rule 2528

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(Rfx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, Rfx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
Rfx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
```

```
)*(x_)^(q_), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_) + Log[(c_)*(x_)^(n_)])*(b_)/(x_), x_Symbol] := Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rule 2394

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_)^(n_))])*(b_)/((f_) + (g_)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

### Rule 2393

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_))])*(b_)/((f_) + (g_)*(x_)), x_Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_)*((d_) + (e_)*(x_)^(n_))]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rubi steps

$$\begin{aligned}
\int \frac{(27c + 27dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{(ag + bgx)^4} dx &= \int \left( \frac{19683(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^4 (a + bx)^4} + \frac{59049d(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^4 (a + bx)^3} \right) dx \\
&= \frac{(19683d^3) \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{a+bx} dx}{b^3 g^4} + \frac{(59049d^2(bc - ad)) \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{(a+bx)^2} dx}{b^3 g^4} + \dots \\
&= -\frac{6561(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^4 g^4 (a + bx)^3} - \frac{59049d(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{2b^4 g^4 (a + bx)^2} \\
&= -\frac{6561(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^4 g^4 (a + bx)^3} - \frac{59049d(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{2b^4 g^4 (a + bx)^2} \\
&= -\frac{6561(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^4 g^4 (a + bx)^3} - \frac{59049d(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{2b^4 g^4 (a + bx)^2} \\
&= -\frac{2187B(bc - ad)^3}{b^4 g^4 (a + bx)^3} - \frac{45927Bd(bc - ad)^2}{4b^4 g^4 (a + bx)^2} - \frac{72171Bd^2(bc - ad)}{2b^4 g^4 (a + bx)} - \frac{72171Bd^3}{2b^4 g^4} \\
&= -\frac{2187B(bc - ad)^3}{b^4 g^4 (a + bx)^3} - \frac{45927Bd(bc - ad)^2}{4b^4 g^4 (a + bx)^2} - \frac{72171Bd^2(bc - ad)}{2b^4 g^4 (a + bx)} - \frac{72171Bd^3}{2b^4 g^4} \\
&= -\frac{2187B(bc - ad)^3}{b^4 g^4 (a + bx)^3} - \frac{45927Bd(bc - ad)^2}{4b^4 g^4 (a + bx)^2} - \frac{72171Bd^2(bc - ad)}{2b^4 g^4 (a + bx)} - \frac{72171Bd^3}{2b^4 g^4} \\
&= -\frac{2187B(bc - ad)^3}{b^4 g^4 (a + bx)^3} - \frac{45927Bd(bc - ad)^2}{4b^4 g^4 (a + bx)^2} - \frac{72171Bd^2(bc - ad)}{2b^4 g^4 (a + bx)} - \frac{72171Bd^3}{2b^4 g^4}
\end{aligned}$$

**Mathematica [A]** time = 0.496521, size = 308, normalized size = 0.99

$$i^3 \left( -18Bd^3 \left( \log(a + bx) \left( \log(a + bx) - 2 \log \left( \frac{b(c+dx)}{bc-ad} \right) \right) - 2 \text{PolyLog} \left( 2, \frac{d(a+bx)}{ad-bc} \right) \right) + 36d^3 \log(a + bx) \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right) \right)$$

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])))/(a\*g + b\*g\*x)^4, x]

```
[Out] (i^3*((-4*B*(b*c - a*d)^3)/(a + b*x)^3 - (21*B*d*(b*c - a*d)^2)/(a + b*x)^2
+ (66*B*d^2*(-(b*c) + a*d))/(a + b*x) - 66*B*d^3*Log[a + b*x] - (12*(b*c -
a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])))/(a + b*x)^3 - (54*d*(b*c - a*
d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])))/(a + b*x)^2 + (108*d^2*(-(b*c) +
a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)])))/(a + b*x) + 36*d^3*Log[a + b*x]
*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 66*B*d^3*Log[c + d*x] - 18*B*d^3*(L
og[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2
, (d*(a + b*x))/(-(b*c) + a*d)])))/(36*b^4*g^4)
```

---

**Maple [B]** time = 0.067, size = 1929, normalized size = 6.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4,x)
```

```
[Out] -d^4*i^3/(a*d-b*c)/g^4*A/b^4*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a+d^3*
i^3/(a*d-b*c)/g^4*A/b^3*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c+1/2*d^4*i
^3/(a*d-b*c)/g^4*B/b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a-1/2*d^3*i^3/(a*d
-b*c)/g^4*B/b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-d^4*i^3/(a*d-b*c)/g^4*B
/b^4*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a+d^4*i^3/(a*d-b*c)/
g^4*A/b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-d^3*i^3/(a*d-b*c)/g^4*A/b^3*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+d^3*i^3/(a*d-b*c)/g^4*B/b^3*dilog(-(d*(b*e/d
+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*c+1/3*e^3*i^3/(a*d-b*c)/g^4*B/(b*e/d+e/(d
*x+c))*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+1/3*e^3*i^3/(a
*d-b*c)/g^4*A/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^3*c+1/9*e^3*i^3/(a*d-b*c)
/g^4*B/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^3*c+1/2*e^2*d*i^3/(a*d-b*c)/g^4*
B/b/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c
+1/2*e^2*d*i^3/(a*d-b*c)/g^4*A/b/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^2*c-1/
9*e^3*d*i^3/(a*d-b*c)/g^4*B/b/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^3*a-1/4*e
^2*d^2*i^3/(a*d-b*c)/g^4*B/b^2/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^2*a+1/4*
e^2*d*i^3/(a*d-b*c)/g^4*B/b/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^2*c-e*d^3*i
^3/(a*d-b*c)/g^4*A/b^3/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)*a+e*d^2*i^3/(a*d
-b*c)/g^4*A/b^2/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)*c-e*d^3*i^3/(a*d-b*c)/g
^4*B/b^3/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)*a+e*d^2*i^3/(a*d-b*c)/g^4*B/b^
2/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)*c-d^4*i^3/(a*d-b*c)/g^4*B/b^4*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a+d
^3*i^3/(a*d-b*c)/g^4*B/b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a
*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*c-1/2*e^2*d^2*i^3/(a*d-b*c)/g^4*A/b^2/(b*e/d
+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^2*a-1/3*e^3*d*i^3/(a*d-b*c)/g^4*A/b/(b*e/d+e/
(d*x+c))*a-e/d/(d*x+c)*b*c)^3*a-e*d^3*i^3/(a*d-b*c)/g^4*B/b^3/(b*e/d+e/(d*x+
```

$$c) * a - e/d / (d*x+c) * b*c) * \ln(b*e/d + (a*d-b*c)*e/d / (d*x+c)) * a + e*d^2*i^3 / (a*d-b*c) / g^4*B/b^2 / (b*e/d + e/(d*x+c) * a - e/d / (d*x+c) * b*c) * \ln(b*e/d + (a*d-b*c)*e/d / (d*x+c)) * c - 1/3 * e^3*d*i^3 / (a*d-b*c) / g^4*B/b / (b*e/d + e/(d*x+c) * a - e/d / (d*x+c) * b*c)^3 * \ln(b*e/d + (a*d-b*c)*e/d / (d*x+c)) * a - 1/2 * e^2*d^2*i^3 / (a*d-b*c) / g^4*B/b^2 / (b*e/d + e/(d*x+c) * a - e/d / (d*x+c) * b*c)^2 * \ln(b*e/d + (a*d-b*c)*e/d / (d*x+c)) * a$$

**Maxima [F]** time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)^4,x, algorithm="maxima")

[Out] 
$$-1/6*B*d^3*i^3*((18*a*b^2*x^2 + 27*a^2*b*x + 11*a^3 + 6*(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3)*\log(b*x + a))*\log(d*x + c)/(b^7*g^4*x^3 + 3*a*b^6*g^4*x^2 + 3*a^2*b^5*g^4*x + a^3*b^4*g^4) - 6*\integrate(1/6*(6*b^4*d*x^4*\log(e) + 45*a^2*b^2*d*x^2 + 38*a^3*b*d*x + 11*a^4*d + 6*(b^4*c*\log(e) + 3*a*b^3*d)*x^3 + 6*(2*b^4*d*x^4 + 6*a^2*b^2*d*x^2 + 4*a^3*b*d*x + a^4*d + (b^4*c + 4*a*b^3*d)*x^3)*\log(b*x + a))/(b^8*d*g^4*x^5 + a^4*b^4*c*g^4 + (b^8*c*g^4 + 4*a*b^7*d*g^4)*x^4 + 2*(2*a*b^7*c*g^4 + 3*a^2*b^6*d*g^4)*x^3 + 2*(3*a^2*b^6*c*g^4 + 2*a^3*b^5*d*g^4)*x^2 + (4*a^3*b^5*c*g^4 + a^4*b^4*d*g^4)*x), x) - 1/6*B*c*d^2*i^3*(6*(3*b^2*x^2 + 3*a*b*x + a^2)*\log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^6*g^4*x^3 + 3*a*b^5*g^4*x^2 + 3*a^2*b^4*g^4*x + a^3*b^3*g^4) + (11*a^2*b^2*c^2 - 7*a^3*b*c*d + 2*a^4*d^2 + 6*(3*b^4*c^2 - 3*a*b^3*c*d + a^2*b^2*d^2)*x^2 + 3*(9*a*b^3*c^2 - 7*a^2*b^2*c*d + 2*a^3*b*d^2)*x)/((b^8*c^2 - 2*a*b^7*c*d + a^2*b^6*d^2)*g^4*x^3 + 3*(a*b^7*c^2 - 2*a^2*b^6*c*d + a^3*b^5*d^2)*g^4*x^2 + 3*(a^2*b^6*c^2 - 2*a^3*b^5*c*d + a^4*b^4*d^2)*g^4*x + (a^3*b^5*c^2 - 2*a^4*b^4*c*d + a^5*b^3*d^2)*g^4) + 6*(3*b^2*c^2*d - 3*a*b*c*d^2 + a^2*d^3)*\log(b*x + a)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^4) - 6*(3*b^2*c^2*d - 3*a*b*c*d^2 + a^2*d^3)*\log(d*x + c)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^4)) - 1/12*B*c^2*d*i^3*(6*(3*b*x + a)*\log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) + (5*a*b^2*c^2 - 22*a^2*b*c*d + 5*a^3*d^2 - 6*(3*b^3*c*d - a*b^2*d^2)*x^2 + 3*(3*b^3*c^2 - 16*a*b^2*c*d + 5*a^2*b*d^2)*x)/((b^7*c^2 - 2*a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3*(a*b^6*c^2 - 2*a^2*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*c*d + a^4*b^3*d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4) - 6*(3*b*c*d^2 - a*d^3)*\log(b*x + a)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4) + 6*(3*b*c*d^2 - a*d^3)*\log(d*x + c)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4)) - 1/18*B*c^3*i^3*((6*$$

$$\begin{aligned} & b^2 d^2 x^2 + 2 b^2 c^2 - 7 a b c d + 11 a^2 d^2 - 3 (b^2 c d - 5 a b d^2) x \\ & x) / ((b^6 c^2 - 2 a b^5 c d + a^2 b^4 d^2) g^4 x^3 + 3 (a b^5 c^2 - 2 a^2 b^4 \\ & 4 c d + a^3 b^3 d^2) g^4 x^2 + 3 (a^2 b^4 c^2 - 2 a^3 b^3 c d + a^4 b^2 d^2) \\ & ) g^4 x + (a^3 b^3 c^2 - 2 a^4 b^2 c d + a^5 b d^2) g^4) + 6 \log(b e x / (d x \\ & + c) + a e / (d x + c)) / (b^4 g^4 x^3 + 3 a b^3 g^4 x^2 + 3 a^2 b^2 g^4 x + a \\ & ^3 b g^4) + 6 d^3 \log(b x + a) / ((b^4 c^3 - 3 a b^3 c^2 d + 3 a^2 b^2 c d^2 \\ & - a^3 b d^3) g^4) - 6 d^3 \log(d x + c) / ((b^4 c^3 - 3 a b^3 c^2 d + 3 a^2 b^2 \\ & 2 c d^2 - a^3 b d^3) g^4) + 1 / 6 A d^3 i^3 ((18 a b^2 x^2 + 27 a^2 b x + 11 \\ & a^3) / (b^7 g^4 x^3 + 3 a b^6 g^4 x^2 + 3 a^2 b^5 g^4 x + a^3 b^4 g^4) + 6 \log \\ & (b x + a) / (b^4 g^4) - 1 / 2 (3 b x + a) A c^2 d i^3 / (b^5 g^4 x^3 + 3 a b^4 \\ & g^4 x^2 + 3 a^2 b^3 g^4 x + a^3 b^2 g^4) - (3 b^2 x^2 + 3 a b x + a^2) A c \\ & d^2 i^3 / (b^6 g^4 x^3 + 3 a b^5 g^4 x^2 + 3 a^2 b^4 g^4 x + a^3 b^3 g^4) - \\ & 1 / 3 A c^3 i^3 / (b^4 g^4 x^3 + 3 a b^3 g^4 x^2 + 3 a^2 b^2 g^4 x + a^3 b g^4) \end{aligned}$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{A d^3 i^3 x^3 + 3 A c d^2 i^3 x^2 + 3 A c^2 d i^3 x + A c^3 i^3 + (B d^3 i^3 x^3 + 3 B c d^2 i^3 x^2 + 3 B c^2 d i^3 x + B c^3 i^3) \log\left(\frac{b e x + a e}{d x + c}\right)}{b^4 g^4 x^4 + 4 a b^3 g^4 x^3 + 6 a^2 b^2 g^4 x^2 + 4 a^3 b g^4 x + a^4 g^4}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)^4,x, algorithm="fricas")

[Out] integral((A\*d^3\*i^3\*x^3 + 3\*A\*c\*d^2\*i^3\*x^2 + 3\*A\*c^2\*d\*i^3\*x + A\*c^3\*i^3 + (B\*d^3\*i^3\*x^3 + 3\*B\*c\*d^2\*i^3\*x^2 + 3\*B\*c^2\*d\*i^3\*x + B\*c^3\*i^3)\*log((b\*e\*x + a\*e)/(d\*x + c)))/(b^4\*g^4\*x^4 + 4\*a\*b^3\*g^4\*x^3 + 6\*a^2\*b^2\*g^4\*x^2 + 4\*a^3\*b\*g^4\*x + a^4\*g^4), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*\*3\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)\*\*4,x)

[Out] Timed out



---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3 \left( B \log \left( \frac{(bx+a)e}{dx+c} \right) + A \right)}{(bgx + ag)^4} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4,x, algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log((b*x + a)*e/(d*x + c)) + A)/(b*g*x + a*g)^4, x)
```

$$3.28 \quad \int \frac{(ci+dx)^3 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{(ag+bgx)^5} dx$$

**Optimal.** Leaf size=89

$$\frac{i^3(c+dx)^4 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{4g^5(a+bx)^4(bc-ad)} - \frac{Bi^3(c+dx)^4}{16g^5(a+bx)^4(bc-ad)}$$

[Out]  $-(B*i^3*(c+d*x)^4)/(16*(b*c-a*d)*g^5*(a+b*x)^4) - (i^3*(c+d*x)^4*(A+B*Log[(e*(a+b*x))/(c+d*x]]))/(4*(b*c-a*d)*g^5*(a+b*x)^4)$

**Rubi [B]** time = 0.72228, antiderivative size = 373, normalized size of antiderivative = 4.19, number of steps used = 18, number of rules used = 4, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.1$ , Rules used = {2528, 2525, 12, 44}

$$\frac{d^3 i^3 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{b^4 g^5 (a+bx)} - \frac{3d^2 i^3 (bc-ad) \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{2b^4 g^5 (a+bx)^2} - \frac{di^3 (bc-ad)^2 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{b^4 g^5 (a+bx)^3} - \frac{i^3 (bc-ad)^3 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{4b^4 g^5 (a+bx)^4}$$

Antiderivative was successfully verified.

[In] `Int[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x]]))/(a*g + b*g*x)^5, x]`

[Out]  $-(B*(b*c-a*d)^3*i^3)/(16*b^4*g^5*(a+b*x)^4) - (B*d*(b*c-a*d)^2*i^3)/(4*b^4*g^5*(a+b*x)^3) - (3*B*d^2*(b*c-a*d)*i^3)/(8*b^4*g^5*(a+b*x)^2) - (B*d^3*i^3)/(4*b^4*g^5*(a+b*x)) - (B*d^4*i^3*Log[a+b*x])/(4*b^4*(b*c-a*d)*g^5) - ((b*c-a*d)^3*i^3*(A+B*Log[(e*(a+b*x))/(c+d*x]]))/(4*b^4*g^5*(a+b*x)^4) - (d*(b*c-a*d)^2*i^3*(A+B*Log[(e*(a+b*x))/(c+d*x]]))/(b^4*g^5*(a+b*x)^3) - (3*d^2*(b*c-a*d)*i^3*(A+B*Log[(e*(a+b*x))/(c+d*x]]))/(2*b^4*g^5*(a+b*x)^2) - (d^3*i^3*(A+B*Log[(e*(a+b*x))/(c+d*x]]))/(b^4*g^5*(a+b*x)) + (B*d^4*i^3*Log[c+d*x])/(4*b^4*(b*c-a*d)*g^5)$

### Rule 2528

`Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]`

Rule 2525

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*((d\_.) + (e\_.)\*(x\_.))^(m\_.), x\_Symbol] := Simp[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^n)/(e\*(m + 1)), x] - Dist[(b\*n\*p)/(e\*(m + 1)), Int[SimplifyIntegrand[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

Rule 12

Int[(a\_)\*(u\_), x\_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b\_)\*(v\_) /; FreeQ[b, x]]

Rule 44

Int[((a\_) + (b\_.)\*(x\_.))^(m\_.)\*((c\_.) + (d\_.)\*(x\_.))^(n\_.), x\_Symbol] := Int[ExpandIntegrand[(a + b\*x)^m\*(c + d\*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b\*c - a\*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])

Rubi steps

$$\begin{aligned}
 \int \frac{(28c + 28dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{(ag + bgx)^5} dx &= \int \left( \frac{21952(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^5 (a + bx)^5} + \frac{65856d(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^5 (a + bx)^4} \right) dx \\
 &= \frac{(21952d^3) \int \frac{A + B \log \left( \frac{e(a+bx)}{c+dx} \right)}{(a+bx)^2} dx}{b^3 g^5} + \frac{(65856d^2(bc - ad)) \int \frac{A + B \log \left( \frac{e(a+bx)}{c+dx} \right)}{(a+bx)^3} dx}{b^3 g^5} + \dots \\
 &= -\frac{5488(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^4 g^5 (a + bx)^4} - \frac{21952d(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^4 g^5 (a + bx)^3} \\
 &= -\frac{5488(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^4 g^5 (a + bx)^4} - \frac{21952d(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^4 g^5 (a + bx)^3} \\
 &= -\frac{5488(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^4 g^5 (a + bx)^4} - \frac{21952d(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^4 g^5 (a + bx)^3} \\
 &= -\frac{1372B(bc - ad)^3}{b^4 g^5 (a + bx)^4} - \frac{5488Bd(bc - ad)^2}{b^4 g^5 (a + bx)^3} - \frac{8232Bd^2(bc - ad)}{b^4 g^5 (a + bx)^2} - \frac{5488Bd^3}{b^4 g^5 (a + bx)}
 \end{aligned}$$

**Mathematica [B]** time = 0.495376, size = 427, normalized size = 4.8

$$i^3 \left( -24a^2Ab^2d^4x^2 - 16a^3Abd^4x - 4a^4Ad^4 + 4B \left( -6a^2b^2d^4x^2 - 4a^3bd^4x - a^4d^4 - 4ab^3d^4x^3 + b^4c \left( 4c^2dx + c^3 + 6cd^2x^2 + \right. \right. \right.$$

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(a\*g + b\*g\*x)^5,x]

[Out] 
$$-(i^3*(4*A*b^4*c^4 + b^4*B*c^4 - 4*a^4*A*d^4 - a^4*B*d^4 + 16*A*b^4*c^3*d*x + 4*b^4*B*c^3*d*x - 16*a^3*A*b*d^4*x - 4*a^3*b*B*d^4*x + 24*A*b^4*c^2*d^2*x^2 + 6*b^4*B*c^2*d^2*x^2 - 24*a^2*A*b^2*d^4*x^2 - 6*a^2*b^2*B*d^4*x^2 + 16*A*b^4*c*d^3*x^3 + 4*b^4*B*c*d^3*x^3 - 16*a*A*b^3*d^4*x^3 - 4*a*b^3*B*d^4*x^3 + 4*B*d^4*(a + b*x)^4*\text{Log}[a + b*x] + 4*B*(-(a^4*d^4) - 4*a^3*b*d^4*x - 6*a^2*b^2*d^4*x^2 - 4*a*b^3*d^4*x^3 + b^4*c*(c^3 + 4*c^2*d*x + 6*c*d^2*x^2 + 4*d^3*x^3))*\text{Log}[(e*(a + b*x))/(c + d*x)] - 4*a^4*B*d^4*\text{Log}[c + d*x] - 16*a^3*b*B*d^4*x*\text{Log}[c + d*x] - 24*a^2*b^2*B*d^4*x^2*\text{Log}[c + d*x] - 16*a*b^3*B*d^4*x^3*\text{Log}[c + d*x] - 4*b^4*B*d^4*x^4*\text{Log}[c + d*x]))/(16*b^4*(b*c - a*d)*g^5*(a + b*x)^4)$$

**Maple [B]** time = 0.052, size = 406, normalized size = 4.6

$$\frac{e^4 d i^3 A a}{4 (a d - b c)^2 g^5} \left( \frac{b e}{d} + \frac{a e}{d x + c} - \frac{b e c}{(d x + c) d} \right)^{-4} - \frac{e^4 i^3 A b c}{4 (a d - b c)^2 g^5} \left( \frac{b e}{d} + \frac{a e}{d x + c} - \frac{b e c}{(d x + c) d} \right)^{-4} + \frac{e^4 d i^3 B a}{4 (a d - b c)^2 g^5} \ln \left( \frac{b e}{d} + \frac{a e}{d x + c} - \frac{b e c}{(d x + c) d} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*i\*x+c\*i)^3\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)^5,x)

[Out] 
$$\frac{1}{4} e^4 d i^3 / (a d - b c)^2 / g^5 A / (b e / d + e / (d x + c) * a - e / d / (d x + c) * b c)^4 a - 1 / 4 e^4 i^3 / (a d - b c)^2 / g^5 A / (b e / d + e / (d x + c) * a - e / d / (d x + c) * b c)^4 b c + 1 / 4 e^4 d i^3 / (a d - b c)^2 / g^5 B / (b e / d + e / (d x + c) * a - e / d / (d x + c) * b c)^4 \ln(b e / d + (a d - b c) * e / d / (d x + c)) * a - 1 / 4 e^4 i^3 / (a d - b c)^2 / g^5 B / (b e / d + e / (d x + c) * a - e / d / (d x + c) * b c)^4 \ln(b e / d + (a d - b c) * e / d / (d x + c)) * b c + 1 / 16 e^4 d i^3 / (a d - b c)^2 / g^5 B / (b e / d + e / (d x + c) * a - e / d / (d x + c) * b c)^4 a - 1 / 16 e^4 i^3 / (a d - b c)^2 / g^5 B / (b e / d + e / (d x + c) * a - e / d / (d x + c) * b c)^4 b c$$

**Maxima [B]** time = 1.99735, size = 4194, normalized size = 47.12

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5,x, algorithm="maxima")
```

```
[Out] -1/48*B*d^3*i^3*(12*(4*b^3*x^3 + 6*a*b^2*x^2 + 4*a^2*b*x + a^3)*log(b*e*x/(d*x + c) + a*e/(d*x + c)))/(b^8*g^5*x^4 + 4*a*b^7*g^5*x^3 + 6*a^2*b^6*g^5*x^2 + 4*a^3*b^5*g^5*x + a^4*b^4*g^5) + (25*a^3*b^3*c^3 - 23*a^4*b^2*c^2*d + 13*a^5*b*c*d^2 - 3*a^6*d^3 + 12*(4*b^6*c^3 - 6*a*b^5*c^2*d + 4*a^2*b^4*c*d^2 - a^3*b^3*d^3)*x^3 + 6*(18*a*b^5*c^3 - 22*a^2*b^4*c^2*d + 13*a^3*b^3*c*d^2 - 3*a^4*b^2*d^3)*x^2 + 4*(22*a^2*b^4*c^3 - 23*a^3*b^3*c^2*d + 13*a^4*b^2*c*d^2 - 3*a^5*b*d^3)*x)/(b^11*c^3 - 3*a*b^10*c^2*d + 3*a^2*b^9*c*d^2 - a^3*b^8*d^3)*g^5*x^4 + 4*(a*b^10*c^3 - 3*a^2*b^9*c^2*d + 3*a^3*b^8*c*d^2 - a^4*b^7*d^3)*g^5*x^3 + 6*(a^2*b^9*c^3 - 3*a^3*b^8*c^2*d + 3*a^4*b^7*c*d^2 - a^5*b^6*d^3)*g^5*x^2 + 4*(a^3*b^8*c^3 - 3*a^4*b^7*c^2*d + 3*a^5*b^6*c*d^2 - a^6*b^5*d^3)*g^5*x + (a^4*b^7*c^3 - 3*a^5*b^6*c^2*d + 3*a^6*b^5*c*d^2 - a^7*b^4*d^3)*g^5) + 12*(4*b^3*c^3*d - 6*a*b^2*c^2*d^2 + 4*a^2*b*c*d^3 - a^3*d^4)*log(b*x + a)/((b^8*c^4 - 4*a*b^7*c^3*d + 6*a^2*b^6*c^2*d^2 - 4*a^3*b^5*c*d^3 + a^4*b^4*d^4)*g^5) - 12*(4*b^3*c^3*d - 6*a*b^2*c^2*d^2 + 4*a^2*b*c*d^3 - a^3*d^4)*log(d*x + c)/((b^8*c^4 - 4*a*b^7*c^3*d + 6*a^2*b^6*c^2*d^2 - 4*a^3*b^5*c*d^3 + a^4*b^4*d^4)*g^5)) - 1/48*B*c*d^2*i^3*(12*(6*b^2*x^2 + 4*a*b*x + a^2)*log(b*e*x/(d*x + c) + a*e/(d*x + c)))/(b^7*g^5*x^4 + 4*a*b^6*g^5*x^3 + 6*a^2*b^5*g^5*x^2 + 4*a^3*b^4*g^5*x + a^4*b^3*g^5) + (13*a^2*b^3*c^3 - 75*a^3*b^2*c^2*d + 33*a^4*b*c*d^2 - 7*a^5*d^3 - 12*(6*b^5*c^2*d - 4*a*b^4*c*d^2 + a^2*b^3*d^3)*x^3 + 6*(6*b^5*c^3 - 46*a*b^4*c^2*d + 29*a^2*b^3*c*d^2 - 7*a^3*b^2*d^3)*x^2 + 4*(10*a*b^4*c^3 - 63*a^2*b^3*c^2*d + 33*a^3*b^2*c*d^2 - 7*a^4*b*d^3)*x)/(b^10*c^3 - 3*a*b^9*c^2*d + 3*a^2*b^8*c*d^2 - a^3*b^7*d^3)*g^5*x^4 + 4*(a*b^9*c^3 - 3*a^2*b^8*c^2*d + 3*a^3*b^7*c*d^2 - a^4*b^6*d^3)*g^5*x^3 + 6*(a^2*b^8*c^3 - 3*a^3*b^7*c^2*d + 3*a^4*b^6*c*d^2 - a^5*b^5*d^3)*g^5*x^2 + 4*(a^3*b^7*c^3 - 3*a^4*b^6*c^2*d + 3*a^5*b^5*c*d^2 - a^6*b^4*d^3)*g^5*x + (a^4*b^6*c^3 - 3*a^5*b^5*c^2*d + 3*a^6*b^4*c*d^2 - a^7*b^3*d^3)*g^5) - 12*(6*b^2*c^2*d^2 - 4*a*b*c*d^3 + a^2*d^4)*log(b*x + a)/((b^7*c^4 - 4*a*b^6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4*a^3*b^4*c*d^3 + a^4*b^3*d^4)*g^5) + 12*(6*b^2*c^2*d^2 - 4*a*b*c*d^3 + a^2*d^4)*log(d*x + c)/((b^7*c^4 - 4*a*b^6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4*a^3*b^4*c*d^3 + a^4*b^3*d^4)*g^5)) - 1/48*B*c^2*d*i^3*(12*(4*b*x + a)*log(b*e*x/(d*x + c) + a*e/(d*x + c)))/(b^6*g^5*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g^5) + (7*a*b^3*c^3 - 33*a^2*b^2*c^2*d + 75*a^3*b*c*d^2 - 13*a^4*d^3 + 12*(4*b^4*c*d^2 - a*b^3*d^3)*x^3 - 6*(4*b^4*c^2*d - 29*a*b^3*c*d^2 + 7*a^2*b^2*d^3)*x^2 + 4*(4*b^4*c^3 - 21*a*b^3*c^2*d + 57*a^2*b^2*c*d^2 - 13*a^3*b*d^3)*x)/(
```

$$\begin{aligned}
& (b^9c^3 - 3a^2b^8c^2d + 3a^2b^7c^2d^2 - a^3b^6d^3)g^5x^4 + 4(a^8b^8c^3 - 3a^2b^7c^2d + 3a^3b^6c^2d^2 - a^4b^5d^3)g^5x^3 + 6(a^2b^7c^3 - 3a^3b^6c^2d + 3a^4b^5c^2d^2 - a^5b^4d^3)g^5x^2 + 4(a^3b^6c^3 - 3a^4b^5c^2d + 3a^5b^4c^2d^2 - a^6b^3d^3)g^5x + (a^4b^5c^3 - 3a^5b^4c^2d + 3a^6b^3c^2d^2 - a^7b^2d^3)g^5 \\
& + 12(4b^3c^2d^3 - a^4d^4)\log(bx + a)/((b^6c^4 - 4a^2b^5c^3d + 6a^2b^4c^2d^2 - 4a^3b^3c^2d^3 + a^4b^2d^4)g^5) - 12(4b^3c^2d^3 - a^4d^4)\log(dx + c)/((b^6c^4 - 4a^2b^5c^3d + 6a^2b^4c^2d^2 - 4a^3b^3c^2d^3 + a^4b^2d^4)g^5) \\
& + 1/48Bc^3i^3((12b^3d^3x^3 - 3b^3c^3 + 13a^2b^2c^2d - 23a^2b^2c^2d^2 + 25a^3d^3 - 6(b^3c^2d^2 - 7a^2b^2d^3))x^2 + 4(b^3c^2d - 5a^2b^2c^2d^2 + 13a^2b^2d^3)x)/((b^8c^3 - 3a^2b^7c^2d + 3a^2b^6c^2d^2 - a^3b^5d^3)g^5x^4 + 4(a^2b^7c^3 - 3a^2b^6c^2d + 3a^3b^5c^2d^2 - a^4b^4d^3)g^5x^3 + 6(a^2b^6c^3 - 3a^3b^5c^2d + 3a^4b^4c^2d^2 - a^5b^3d^3)g^5x^2 + 4(a^3b^5c^3 - 3a^4b^4c^2d + 3a^5b^3c^2d^2 - a^6b^2d^3)g^5x + (a^4b^4c^3 - 3a^5b^3c^2d + 3a^6b^2c^2d^2 - a^7b^2d^3)g^5) - 12\log(bex/(dx + c) + ae/(dx + c))/(b^5g^5x^4 + 4a^2b^4g^5x^3 + 6a^2b^3g^5x^2 + 4a^3b^2g^5x + a^4bg^5) + 12d^4\log(bx + a)/((b^5c^4 - 4a^2b^4c^3d + 6a^2b^3c^2d^2 - 4a^3b^2c^2d^3 + a^4bd^4)g^5) - 12d^4\log(dx + c)/((b^5c^4 - 4a^2b^4c^3d + 6a^2b^3c^2d^2 - 4a^3b^2c^2d^3 + a^4bd^4)g^5) - 1/4(4b^2x^2 + 4abx + a^2)A^2c^2di^3/(b^6g^5x^4 + 4a^2b^5g^5x^3 + 6a^2b^4g^5x^2 + 4a^3b^3g^5x + a^4b^2g^5) - 1/4(6b^2x^2 + 4abx + a^2)A^2cd^2i^3/(b^7g^5x^4 + 4a^2b^6g^5x^3 + 6a^2b^5g^5x^2 + 4a^3b^4g^5x + a^4b^3g^5) - 1/4(4b^3x^3 + 6a^2b^2x^2 + 4a^2bx + a^3)A^3d^3i^3/(b^8g^5x^4 + 4a^2b^7g^5x^3 + 6a^2b^6g^5x^2 + 4a^3b^5g^5x + a^4b^4g^5) - 1/4A^3c^3i^3/(b^5g^5x^4 + 4a^2b^4g^5x^3 + 6a^2b^3g^5x^2 + 4a^3b^2g^5x + a^4bg^5)
\end{aligned}$$

**Fricas [B]** time = 0.542133, size = 710, normalized size = 7.98

$$\frac{4((4A + B)b^4cd^3 - (4A + B)ab^3d^4)i^3x^3 + 6((4A + B)b^4c^2d^2 - (4A + B)a^2b^2d^4)i^3x^2 + 4((4A + B)b^4c^3d - (4A + B)ab^3c^3)g^5x^4 + 4((4A + B)b^4c^3d - (4A + B)ab^3c^3)g^5x^3 + 6((4A + B)b^4c^3d - (4A + B)ab^3c^3)g^5x^2 + 4((4A + B)b^4c^3d - (4A + B)ab^3c^3)g^5x + 4((4A + B)b^4c^3d - (4A + B)ab^3c^3)g^5}{16((b^9c - ab^8d)g^5x^4 + 4(ab^8c - a^2b^7d)g^5x^3 + 6(a^2b^7c - ab^6d)g^5x^2 + 4(ab^6c - a^2b^5d)g^5x + 4(ab^5c - a^2b^4d)g^5}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)^5,x, algothm="fricas")

[Out] -1/16\*(4\*((4\*A + B)\*b^4\*c\*d^3 - (4\*A + B)\*a\*b^3\*d^4)\*i^3\*x^3 + 6\*((4\*A + B)\*b^4\*c^2\*d^2 - (4\*A + B)\*a^2\*b^2\*d^4)\*i^3\*x^2 + 4\*((4\*A + B)\*b^4\*c^3\*d - (4\*A + B)\*a^3\*b\*d^4)\*i^3\*x + ((4\*A + B)\*b^4\*c^4 - (4\*A + B)\*a^4\*d^4)\*i^3 + 4\*

$$(B*b^4*d^4*i^3*x^4 + 4*B*b^4*c*d^3*i^3*x^3 + 6*B*b^4*c^2*d^2*i^3*x^2 + 4*B*b^4*c^3*d*i^3*x + B*b^4*c^4*i^3)*log((b*e*x + a*e)/(d*x + c))/((b^9*c - a*b^8*d)*g^5*x^4 + 4*(a*b^8*c - a^2*b^7*d)*g^5*x^3 + 6*(a^2*b^7*c - a^3*b^6*d)*g^5*x^2 + 4*(a^3*b^6*c - a^4*b^5*d)*g^5*x + (a^4*b^5*c - a^5*b^4*d)*g^5)$$

**Sympy [B]** time = 157.452, size = 864, normalized size = 9.71

$$\frac{Bd^4i^3 \log \left( x + \frac{\frac{Ba^2d^6i^3}{ad-bc} + \frac{2Babcd^5i^3}{ad-bc} + Bad^5i^3 - \frac{Bb^2c^2d^4i^3}{ad-bc} + Bbcd^4i^3}{2Bbd^5i^3} \right)}{4b^4g^5(ad-bc)} + \frac{Bd^4i^3 \log \left( x + \frac{\frac{Ba^2d^6i^3}{ad-bc} - \frac{2Babcd^5i^3}{ad-bc} + Bad^5i^3 + \frac{Bb^2c^2d^4i^3}{ad-bc} + Bbcd^4i^3}{2Bbd^5i^3} \right)}{4b^4g^5(ad-bc)} - \frac{4Aa^3d}{4b^4g^5(ad-bc)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*\*3\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)\*\*5,x)

[Out] 
$$\begin{aligned} & -B*d**4*i**3*log(x + (-B*a**2*d**6*i**3/(a*d - b*c) + 2*B*a*b*c*d**5*i**3/(a*d - b*c) + B*a*d**5*i**3 - B*b**2*c**2*d**4*i**3/(a*d - b*c) + B*b*c*d**4*i**3)/(2*B*b*d**5*i**3))/(4*b**4*g**5*(a*d - b*c)) + B*d**4*i**3*log(x + (B*a**2*d**6*i**3/(a*d - b*c) - 2*B*a*b*c*d**5*i**3/(a*d - b*c) + B*a*d**5*i**3 + B*b**2*c**2*d**4*i**3/(a*d - b*c) + B*b*c*d**4*i**3)/(2*B*b*d**5*i**3)))/(4*b**4*g**5*(a*d - b*c)) - (4*A*a**3*d**3*i**3 + 4*A*a**2*b*c*d**2*i**3 + 4*A*a*b**2*c**2*d*i**3 + 4*A*b**3*c**3*i**3 + B*a**3*d**3*i**3 + B*a**2*b*c*d**2*i**3 + B*a*b**2*c**2*d*i**3 + B*b**3*c**3*i**3 + x**3*(16*A*b**3*d**3*i**3 + 4*B*b**3*d**3*i**3) + x**2*(24*A*a*b**2*d**3*i**3 + 24*A*b**3*c*d**2*i**3 + 6*B*a*b**2*d**3*i**3 + 6*B*b**3*c*d**2*i**3) + x*(16*A*a**2*b*d**3*i**3 + 16*A*a*b**2*c*d**2*i**3 + 16*A*b**3*c**2*d*i**3 + 4*B*a**2*b*d**3*i**3 + 4*B*a*b**2*c*d**2*i**3 + 4*B*b**3*c**2*d*i**3))/(16*a**4*b**4*g**5 + 64*a**3*b**5*g**5*x + 96*a**2*b**6*g**5*x**2 + 64*a*b**7*g**5*x**3 + 16*b**8*g**5*x**4) + (-B*a**3*d**3*i**3 - B*a**2*b*c*d**2*i**3 - 4*B*a**2*b*d**3*i**3*x - B*a*b**2*c**2*d*i**3 - 4*B*a*b**2*c*d**2*i**3*x - 6*B*a*b**2*d**3*i**3*x**2 - B*b**3*c**3*i**3 - 4*B*b**3*c**2*d*i**3*x - 6*B*b**3*c*d**2*i**3*x**2 - 4*B*b**3*d**3*i**3*x**3)*log(e*(a + b*x)/(c + d*x))/(4*a**4*b**4*g**5 + 16*a**3*b**5*g**5*x + 24*a**2*b**6*g**5*x**2 + 16*a*b**7*g**5*x**3 + 4*b**8*g**5*x**4)$$

**Giac [B]** time = 1.32788, size = 776, normalized size = 8.72

$$-\frac{Bd^4 \log(bx+a)}{4(b^5cg^5i-ab^4dg^5i)} + \frac{Bd^4 \log(dx+c)}{4(b^5cg^5i-ab^4dg^5i)} + \frac{(4Bb^3d^3ix^3 + 6Bb^3cd^2ix^2 + 6Bab^2d^3ix^2 + 4Bb^3c^2dix + 4Bab^2cd^2ix + 4Aa^3d)}{4(b^8g^5x^4 + 4ab^7g^5x^3 + 6a^2b^6g^5x^2 + 4ab^7g^5x^3 + 6a^2b^6g^5x^2 + 4a^3d)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5,x, algorithm="giac")
```

```
[Out] -1/4*B*d^4*log(b*x + a)/(b^5*c*g^5*i - a*b^4*d*g^5*i) + 1/4*B*d^4*log(d*x + c)/(b^5*c*g^5*i - a*b^4*d*g^5*i) + 1/4*(4*B*b^3*d^3*i*x^3 + 6*B*b^3*c*d^2*i*x^2 + 6*B*a*b^2*d^3*i*x^2 + 4*B*b^3*c^2*d*i*x + 4*B*a*b^2*c*d^2*i*x + 4*B*a^2*b*d^3*i*x + B*b^3*c^3*i + B*a*b^2*c^2*d*i + B*a^2*b*c*d^2*i + B*a^3*d^3*i)*log((b*x + a)/(d*x + c))/(b^8*g^5*x^4 + 4*a*b^7*g^5*x^3 + 6*a^2*b^6*g^5*x^2 + 4*a^3*b^5*g^5*x + a^4*b^4*g^5) + 1/16*(16*A*b^3*d^3*i*x^3 + 20*B*b^3*d^3*i*x^3 + 24*A*b^3*c*d^2*i*x^2 + 30*B*b^3*c*d^2*i*x^2 + 24*A*a*b^2*d^3*i*x^2 + 30*B*a*b^2*d^3*i*x^2 + 16*A*b^3*c^2*d*i*x + 20*B*b^3*c^2*d*i*x + 16*A*a*b^2*c*d^2*i*x + 20*B*a*b^2*c*d^2*i*x + 16*A*a^2*b*d^3*i*x + 20*B*a^2*b*d^3*i*x + 4*A*b^3*c^3*i + 5*B*b^3*c^3*i + 4*A*a*b^2*c^2*d*i + 5*B*a*b^2*c^2*d*i + 4*A*a^2*b*c*d^2*i + 5*B*a^2*b*c*d^2*i + 4*A*a^3*d^3*i + 5*B*a^3*d^3*i)/(b^8*g^5*x^4 + 4*a*b^7*g^5*x^3 + 6*a^2*b^6*g^5*x^2 + 4*a^3*b^5*g^5*x + a^4*b^4*g^5)
```



$$3.29 \quad \int \frac{(ci+dx)^3 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{(ag+bgx)^6} dx$$

**Optimal.** Leaf size=181

$$-\frac{bi^3(c+dx)^5 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{5g^6(a+bx)^5(bc-ad)^2} + \frac{di^3(c+dx)^4 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{4g^6(a+bx)^4(bc-ad)^2} - \frac{bBi^3(c+dx)^5}{25g^6(a+bx)^5(bc-ad)^2} + \frac{Bdi^3(c+dx)}{16g^6(a+bx)^4(bc-ad)}$$

[Out] (B\*d\*i^3\*(c + d\*x)^4)/(16\*(b\*c - a\*d)^2\*g^6\*(a + b\*x)^4) - (b\*B\*i^3\*(c + d\*x)^5)/(25\*(b\*c - a\*d)^2\*g^6\*(a + b\*x)^5) + (d\*i^3\*(c + d\*x)^4\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])))/(4\*(b\*c - a\*d)^2\*g^6\*(a + b\*x)^4) - (b\*i^3\*(c + d\*x)^5\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])))/(5\*(b\*c - a\*d)^2\*g^6\*(a + b\*x)^5)

**Rubi [B]** time = 0.865167, antiderivative size = 409, normalized size of antiderivative = 2.26, number of steps used = 18, number of rules used = 4, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.1$ , Rules used = {2528, 2525, 12, 44}

$$\frac{d^3i^3 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{2b^4g^6(a+bx)^2} - \frac{d^2i^3(bc-ad) \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{b^4g^6(a+bx)^3} - \frac{3di^3(bc-ad)^2 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{4b^4g^6(a+bx)^4} - \frac{i^3(bc-ad)^3}{5b^4g^6}$$

Antiderivative was successfully verified.

[In] Int[((c\*i + d\*i\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]]))/(a\*g + b\*g\*x)^6, x]

[Out] -(B\*(b\*c - a\*d)^3\*i^3)/(25\*b^4\*g^6\*(a + b\*x)^5) - (11\*B\*d\*(b\*c - a\*d)^2\*i^3)/(80\*b^4\*g^6\*(a + b\*x)^4) - (3\*B\*d^2\*(b\*c - a\*d)\*i^3)/(20\*b^4\*g^6\*(a + b\*x)^3) - (B\*d^3\*i^3)/(40\*b^4\*g^6\*(a + b\*x)^2) + (B\*d^4\*i^3)/(20\*b^4\*(b\*c - a\*d)\*g^6\*(a + b\*x)) + (B\*d^5\*i^3\*Log[a + b\*x])/(20\*b^4\*(b\*c - a\*d)^2\*g^6) - ((b\*c - a\*d)^3\*i^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]]))/(5\*b^4\*g^6\*(a + b\*x)^5) - (3\*d\*(b\*c - a\*d)^2\*i^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]]))/(4\*b^4\*g^6\*(a + b\*x)^4) - (d^2\*(b\*c - a\*d)\*i^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]]))/(b^4\*g^6\*(a + b\*x)^3) - (d^3\*i^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]]))/(2\*b^4\*g^6\*(a + b\*x)^2) - (B\*d^5\*i^3\*Log[c + d\*x])/(20\*b^4\*(b\*c - a\*d)^2\*g^6)

**Rule 2528**

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*(RGx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u

```
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

### Rubi steps

$$\begin{aligned}
\int \frac{(29c + 29dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{(ag + bgx)^6} dx &= \int \left( \frac{24389(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^6 (a + bx)^6} + \frac{73167d(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^6 (a + bx)^5} \right) dx \\
&= \frac{(24389d^3) \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{(a+bx)^3} dx}{b^3 g^6} + \frac{(73167d^2(bc - ad)) \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{(a+bx)^4} dx}{b^3 g^6} + \dots \\
&= -\frac{24389(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{5b^4 g^6 (a + bx)^5} - \frac{73167d(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{4b^4 g^6 (a + bx)^4} \\
&= -\frac{24389(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{5b^4 g^6 (a + bx)^5} - \frac{73167d(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{4b^4 g^6 (a + bx)^4} \\
&= -\frac{24389(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{5b^4 g^6 (a + bx)^5} - \frac{73167d(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{4b^4 g^6 (a + bx)^4} \\
&= -\frac{24389B(bc - ad)^3}{25b^4 g^6 (a + bx)^5} - \frac{268279Bd(bc - ad)^2}{80b^4 g^6 (a + bx)^4} - \frac{73167Bd^2(bc - ad)}{20b^4 g^6 (a + bx)^3} - \frac{24389Bd^3}{40b^4 g^6}
\end{aligned}$$

**Mathematica [B]** time = 0.621215, size = 608, normalized size = 3.36

$$i^3 \left( 200a^2 Ab^3 d^5 x^3 + 200a^3 Ab^2 d^5 x^2 + 100a^4 Abd^5 x + 20a^5 Ad^5 + 20B(bc - ad)^2 (a^2 bd^2(2c + 5dx) + a^3 d^3 + ab^2 d(3c^2 + \dots) \right)$$

Antiderivative was successfully verified.

[In] Integrate[(((c\*i + d\*i\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])))/(a\*g + b\*g\*x)^6,x]

[Out] -(i^3\*(80\*A\*b^5\*c^5 + 16\*b^5\*B\*c^5 - 100\*a\*A\*b^4\*c^4\*d - 25\*a\*b^4\*B\*c^4\*d + 20\*a^5\*A\*d^5 + 9\*a^5\*B\*d^5 + 300\*A\*b^5\*c^4\*d\*x + 55\*b^5\*B\*c^4\*d\*x - 400\*a\*A\*b^4\*c^3\*d^2\*x - 100\*a\*b^4\*B\*c^3\*d^2\*x + 100\*a^4\*A\*b\*d^5\*x + 45\*a^4\*b\*B\*d^5\*x + 400\*A\*b^5\*c^3\*d^2\*x^2 + 60\*b^5\*B\*c^3\*d^2\*x^2 - 600\*a\*A\*b^4\*c^2\*d^3\*x^2 - 150\*a\*b^4\*B\*c^2\*d^3\*x^2 + 200\*a^3\*A\*b^2\*d^5\*x^2 + 90\*a^3\*b^2\*B\*d^5\*x^2 + 200\*A\*b^5\*c^2\*d^3\*x^3 + 10\*b^5\*B\*c^2\*d^3\*x^3 - 400\*a\*A\*b^4\*c\*d^4\*x^3 - 100\*a\*b^4\*B\*c\*d^4\*x^3 + 200\*a^2\*A\*b^3\*d^5\*x^3 + 90\*a^2\*b^3\*B\*d^5\*x^3 - 20\*b^5\*B\*c\*d^4\*x^4 + 20\*a\*b^4\*B\*d^5\*x^4 - 20\*B\*d^5\*(a + b\*x)^5\*Log[a + b\*x] + 20\*B\*(b\*c - a\*d)^2\*(a^3\*d^3 + a^2\*b\*d^2\*(2\*c + 5\*d\*x) + a\*b^2\*d\*(3\*c^2 + 10\*c\*d\*x + 10\*d^2\*x^2) + b^3\*(4\*c^3 + 15\*c^2\*d\*x + 20\*c\*d^2\*x^2 + 10\*d^3\*x^3))\*Log[(e\*(a + b\*x))/(c + d\*x)] + 20\*a^5\*B\*d^5\*Log[c + d\*x] + 100\*a^4\*b\*B\*d^5\*x

$$\frac{*Log[c + d*x] + 200*a^3*b^2*B*d^5*x^2*Log[c + d*x] + 200*a^2*b^3*B*d^5*x^3*Log[c + d*x] + 100*a*b^4*B*d^5*x^4*Log[c + d*x] + 20*b^5*B*d^5*x^5*Log[c + d*x])}{(400*b^4*(b*c - a*d)^2*g^6*(a + b*x)^5}$$

**Maple [B]** time = 0.049, size = 828, normalized size = 4.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^6,x)`

[Out]  $\frac{1}{4}e^{4d^2i^3/(ad-bc)^3/g^6A/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c}^{4a-1} / 4e^{4d^2i^3/(ad-bc)^3/g^6A/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c}^{4b^c-1} / 5e^{5d^2i^3/(ad-bc)^3/g^6A*b/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c}^{5a+1/5} * e^{5i^3/(ad-bc)^3/g^6A*b^2/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c}^{5c+1/4} * e^{4d^2i^3/(ad-bc)^3/g^6B/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c}^{4*ln(b^e/d+(ad-bc)*e/d/(d*x+c))^a-1/4} * e^{4d^2i^3/(ad-bc)^3/g^6B/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c}^{4*ln(b^e/d+(ad-bc)*e/d/(d*x+c))^b^c+1/16} * e^{4d^2i^3/(ad-bc)^3/g^6B/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c}^{4a-1/16} * e^{4d^2i^3/(ad-bc)^3/g^6B/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c}^{4b^c-1/5} * e^{5d^2i^3/(ad-bc)^3/g^6B*b/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c}^{5*ln(b^e/d+(ad-bc)*e/d/(d*x+c))^a+1/5} * e^{5i^3/(ad-bc)^3/g^6B*b^2/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c}^{5*ln(b^e/d+(ad-bc)*e/d/(d*x+c))^c-1/25} * e^{5d^2i^3/(ad-bc)^3/g^6B*b/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c}^{5a+1/25} * e^{5i^3/(ad-bc)^3/g^6B*b^2/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c}^{5c}$

**Maxima [B]** time = 2.5098, size = 5694, normalized size = 31.46

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^6,x, algorithm="maxima")`

[Out]  $-1/1200*B*d^3*i^3*(60*(10*b^3*x^3 + 10*a*b^2*x^2 + 5*a^2*b*x + a^3)*log(b^e*x/(d*x + c) + a^e/(d*x + c)))/(b^9*g^6*x^5 + 5*a*b^8*g^6*x^4 + 10*a^2*b^7*g^6*x^3 + 10*a^3*b^6*g^6*x^2 + 5*a^4*b^5*g^6*x + a^5*b^4*g^6) + (77*a^3*b^4*$

$$\begin{aligned}
& c^4 - 548a^4b^3c^3d + 352a^5b^2c^2d^2 - 148a^6b^3cd^3 + 27a^7d^4 - 60(10b^7c^3d - 10ab^6c^2d^2 + 5a^2b^5c^3d - a^3b^4d^4)x^4 \\
& + 30(10b^7c^4 - 100ab^6c^3d + 95a^2b^5c^2d^2 - 46a^3b^4c^3d^3 + 9a^4b^3d^4)x^3 + 10(50ab^6c^4 - 410a^2b^5c^3d + 337a^3b^4 \\
& *c^2d^2 - 148a^4b^3cd^3 + 27a^5b^2d^4)x^2 + 5(65a^2b^5c^4 - 488a^3b^4c^3d + 352a^4b^3c^2d^2 - 148a^5b^2cd^3 + 27a^6bd^4)x \\
& ) / ((b^{13}c^4 - 4ab^{12}c^3d + 6a^2b^{11}c^2d^2 - 4a^3b^{10}c^3d + a^4 \\
& *b^9d^4)g^6x^5 + 5(ab^{12}c^4 - 4a^2b^{11}c^3d + 6a^3b^{10}c^2d^2 - 4a^4b^9cd^3 + a^5b^8d^4)g^6x^4 + 10(a^2b^{11}c^4 - 4a^3b^{10}c^3 \\
& *d + 6a^4b^9c^2d^2 - 4a^5b^8cd^3 + a^6b^7d^4)g^6x^3 + 10(a^3b^{10}c^4 - 4a^4b^9c^3d + 6a^5b^8c^2d^2 - 4a^6b^7cd^3 + a^7b^6d^4) \\
& *g^6x^2 + 5(a^4b^9c^4 - 4a^5b^8c^3d + 6a^6b^7c^2d^2 - 4a^7b^6cd^3 + a^8b^5d^4)g^6x + (a^5b^8c^4 - 4a^6b^7c^3d + 6a^7b^6 \\
& *c^2d^2 - 4a^8b^5cd^3 + a^9b^4d^4)g^6) - 60(10b^3c^3d^2 - 10ab^2c^2d^3 + 5a^2b^3cd^4 - a^3d^5) * \log(bx + a) / ((b^9c^5 - 5ab^8c^4 \\
& *d + 10a^2b^7c^3d^2 - 10a^3b^6c^2d^3 + 5a^4b^5cd^4 - a^5b^4d^5) * g^6) + 60(10b^3c^3d^2 - 10ab^2c^2d^3 + 5a^2b^3cd^4 - a^3d^5) * \\
& \log(dx + c) / ((b^9c^5 - 5ab^8c^4d + 10a^2b^7c^3d^2 - 10a^3b^6c^2d^3 + 5a^4b^5cd^4 - a^5b^4d^5) * g^6)) - 1/600B^3cd^2i^3(60(10b^2 \\
& *x^2 + 5ab^2x + a^2) * \log(b^2x^2 / (dx + c) + a^2e / (dx + c))) / (b^8g^6x^5 + 5ab^7g^6x^4 + 10a^2b^6g^6x^3 + 10a^3b^5g^6x^2 + 5a^4b^4g^6x \\
& + a^5b^3g^6) + (47a^2b^4c^4 - 278a^3b^3c^3d + 822a^4b^2c^2d^2 - 278a^5b^3cd^3 + 47a^6d^4 + 60(10b^6c^2d^2 - 5ab^5cd^3 + a^2b^4d^4) \\
& *x^4 - 30(10b^6c^3d - 95ab^5c^2d^2 + 46a^2b^4cd^3 - 9a^3b^3d^4) * x^3 + 10(20b^6c^4 - 140ab^5c^3d + 537a^2b^4c^2d^2 - 248a^3b^3cd^3 + 47a^4b^2d^4) \\
& *x^2 + 5(35ab^5c^4 - 218a^2b^4cd^3 * d + 702a^3b^3c^2d^2 - 278a^4b^2cd^3 + 47a^5bd^4) * x) / ((b^{12}c^4 - 4ab^{11}c^3d + 6a^2b^{10}c^2d^2 - 4a^3b^9cd^3 + a^4b^8d^4) \\
& *g^6x^5 + 5(ab^{11}c^4 - 4a^2b^{10}c^3d + 6a^3b^9c^2d^2 - 4a^4b^8cd^3 + a^5b^7d^4) * g^6x^4 + 10(a^2b^{10}c^4 - 4a^3b^9c^3d + 6a^4b^8c^2d^2 - 4a^5b^7cd^3 + a^6b^6d^4) \\
& *g^6x^3 + 10(a^3b^9c^4 - 4a^4b^8c^3d + 6a^5b^7c^2d^2 - 4a^6b^6cd^3 + a^7b^5d^4) * g^6x^2 + 5(a^4b^8c^4 - 4a^5b^7c^3d + 6a^6b^6c^2d^2 - 4a^7b^5cd^3 + a^8b^4d^4) \\
& *g^6x + (a^5b^7c^4 - 4a^6b^6c^3d + 6a^7b^5c^2d^2 - 4a^8b^4cd^3 + a^9b^3d^4) * g^6) + 60(10b^2c^2d^3 - 5ab^3cd^4 + a^2d^5) * \log(bx + a) / ((b^8c^5 - 5ab^7c^4d + 10a^2b^6c^3d^2 - 10a^3b^5c^2d^3 + 5a^4b^4cd^4 - a^5b^3d^5) * g^6) - 60(10b^2c^2d^3 - 5ab^3cd^4 + a^2d^5) * \log(dx + c) / ((b^8c^5 - 5ab^7c^4d + 10a^2b^6c^3d^2 - 10a^3b^5c^2d^3 + 5a^4b^4cd^4 - a^5b^3d^5) * g^6)) - 1/400B^3cd^2d^2i^3(60(5b^2x + a) * \log(b^2x^2 / (dx + c) + a^2e / (dx + c))) / (b^7g^6x^5 + 5ab^6g^6x^4 + 10a^2b^5g^6x^3 + 10a^3b^4g^6x^2 + 5a^4b^3g^6x + a^5b^2g^6) + (27ab^4c^4 - 148a^2b^3c^3d + 352a^3b^2c^2d^2 - 548a^4b^3cd^3 + 77a^5d^4 - 60(5b^5cd^3 - ab^4d^4) * x^4 + 30(5b^5c^2d^2 - 46ab^4cd^3 + 9a^2b^3d^4) * x^3 - 10(10b^5c^3d - 67ab^4c^2d^2 + 248a^2b^3cd^3 - 47a^3b^2d^4) * x^2 + 5(15b^5c^4 - 88a^4b^4c^3d^2 + 248a^5b^3cd^3 - 47a^6b^2d^4) * x + 5(15b^5c^4 - 88a^4b^4c^3d^2 + 248a^5b^3cd^3 - 47a^6b^2d^4) * x^2 + 5(15b^5c^4 - 88a^4b^4c^3d^2 + 248a^5b^3cd^3 - 47a^6b^2d^4) * x^3 + 5(15b^5c^4 - 88a^4b^4c^3d^2 + 248a^5b^3cd^3 - 47a^6b^2d^4) * x^4 + 5(15b^5c^4 - 88a^4b^4c^3d^2 + 248a^5b^3cd^3 - 47a^6b^2d^4) * x^5)
\end{aligned}$$

$$\begin{aligned}
& b^4c^3d + 232a^2b^3c^2d^2 - 428a^3b^2c^2d^3 + 77a^4b^2d^4)x)/((b^11c^4 - 4a^2b^10c^3d + 6a^2b^9c^2d^2 - 4a^3b^8c^2d^3 + a^4b^7d^4) \\
& ) * g^6x^5 + 5(a^2b^10c^4 - 4a^2b^9c^3d + 6a^3b^8c^2d^2 - 4a^4b^7c^2d^3 + a^5b^6d^4) * g^6x^4 + 10(a^2b^9c^4 - 4a^3b^8c^3d + 6a^4b^7c^2d^2 - 4a^5b^6c^2d^3 + a^6b^5d^4) * g^6x^3 + 10(a^3b^8c^4 - 4a^4b^7c^3d + 6a^5b^6c^2d^2 - 4a^6b^5c^2d^3 + a^7b^4d^4) * g^6x^2 + \\
& 5(a^4b^7c^4 - 4a^5b^6c^3d + 6a^6b^5c^2d^2 - 4a^7b^4c^2d^3 + a^8b^3d^4) * g^6x + (a^5b^6c^4 - 4a^6b^5c^3d + 6a^7b^4c^2d^2 - 4a^8b^3c^2d^3 + a^9b^2d^4) * g^6) - 60(5b^5c^4d - a^5d^5) * \log(bx + a) / ((b^7c^5 - 5a^2b^6c^4d + 10a^2b^5c^3d^2 - 10a^3b^4c^2d^3 + 5a^4b^3c^2d^4 - a^5b^2d^5) * g^6) + 60(5b^5c^4d - a^5d^5) * \log(dx + c) / ((b^7c^5 - 5a^2b^6c^4d + 10a^2b^5c^3d^2 - 10a^3b^4c^2d^3 + 5a^4b^3c^2d^4 - a^5b^2d^5) * g^6) - 1/300 * B * c^3 * i^3 * ((60b^4d^4x^4 + 12b^4c^4 - 63a^2b^3c^3d + 137a^2b^2c^2d^2 - 163a^3b^2c^2d^3 + 137a^4d^4 - 30(b^4c^3d^3 - 9a^2b^3d^4) * x^3 + 10(2b^4c^2d^2 - 13a^2b^3c^2d^3 + 47a^2b^2d^4) * x^2 - 5(3b^4c^3d - 17a^2b^3c^2d^2 + 43a^2b^2c^2d^3 - 77a^3b^2d^4) * x) / ((b^10c^4 - 4a^2b^9c^3d + 6a^2b^8c^2d^2 - 4a^3b^7c^2d^3 + a^4b^6d^4) * g^6x^5 + 5(a^2b^9c^4 - 4a^2b^8c^3d + 6a^3b^7c^2d^2 - 4a^4b^6c^2d^3 + a^5b^5d^4) * g^6x^4 + 10(a^2b^8c^4 - 4a^3b^7c^3d + 6a^4b^6c^2d^2 - 4a^5b^5c^2d^3 + a^6b^4d^4) * g^6x^3 + 10(a^3b^7c^4 - 4a^4b^6c^3d + 6a^5b^5c^2d^2 - 4a^6b^4c^2d^3 + a^7b^3d^4) * g^6x^2 + 5(a^4b^6c^4 - 4a^5b^5c^3d + 6a^6b^4c^2d^2 - 4a^7b^3c^2d^3 + a^8b^2d^4) * g^6x + (a^5b^5c^4 - 4a^6b^4c^3d + 6a^7b^3c^2d^2 - 4a^8b^2c^2d^3 + a^9b^2d^4) * g^6) + 60 * \log(b * e * x / (d * x + c)) + a * e / (d * x + c) / (b^6 * g^6 * x^5 + 5 * a * b^5 * g^6 * x^4 + 10 * a^2 * b^4 * g^6 * x^3 + 10 * a^3 * b^3 * g^6 * x^2 + 5 * a^4 * b^2 * g^6 * x + a^5 * b * g^6) + 60 * d^5 * \log(b * x + a) / ((b^6 * c^5 - 5 * a * b^5 * c^4 * d + 10 * a^2 * b^4 * c^3 * d^2 - 10 * a^3 * b^3 * c^2 * d^3 + 5 * a^4 * b^2 * c * d^4 - a^5 * b * d^5) * g^6) - 60 * d^5 * \log(dx + c) / ((b^6 * c^5 - 5 * a * b^5 * c^4 * d + 10 * a^2 * b^4 * c^3 * d^2 - 10 * a^3 * b^3 * c^2 * d^3 + 5 * a^4 * b^2 * c * d^4 - a^5 * b * d^5) * g^6) - 3/20 * (5 * b * x + a) * A * c^2 * d * i^3 / (b^7 * g^6 * x^5 + 5 * a * b^6 * g^6 * x^4 + 10 * a^2 * b^5 * g^6 * x^3 + 10 * a^3 * b^4 * g^6 * x^2 + 5 * a^4 * b^3 * g^6 * x + a^5 * b^2 * g^6) - 1/10 * (10 * b^2 * x^2 + 5 * a * b * x + a^2) * A * c * d^2 * i^3 / (b^8 * g^6 * x^5 + 5 * a * b^7 * g^6 * x^4 + 10 * a^2 * b^6 * g^6 * x^3 + 10 * a^3 * b^5 * g^6 * x^2 + 5 * a^4 * b^4 * g^6 * x + a^5 * b^3 * g^6) - 1/20 * (10 * b^3 * x^3 + 10 * a * b^2 * x^2 + 5 * a^2 * b * x + a^3) * A * d^3 * i^3 / (b^9 * g^6 * x^5 + 5 * a * b^8 * g^6 * x^4 + 10 * a^2 * b^7 * g^6 * x^3 + 10 * a^3 * b^6 * g^6 * x^2 + 5 * a^4 * b^5 * g^6 * x + a^5 * b^4 * g^6) - 1/5 * A * c^3 * i^3 / (b^6 * g^6 * x^5 + 5 * a * b^5 * g^6 * x^4 + 10 * a^2 * b^4 * g^6 * x^3 + 10 * a^3 * b^3 * g^6 * x^2 + 5 * a^4 * b^2 * g^6 * x + a^5 * b * g^6)
\end{aligned}$$

**Fricas [B]** time = 0.52562, size = 1337, normalized size = 7.39

$$20(Bb^5cd^4 - Bab^4d^5)i^3x^4 - 10((20A + B)b^5c^2d^3 - 10(4A + B)ab^4cd^4 + (20A + 9B)a^2b^3d^5)i^3x^3 - 10(2(20A + 3B)b^5c^2d^3 - 10(4A + B)ab^4cd^4 + (20A + 9B)a^2b^3d^5)i^3x^2 - 10(2(20A + 3B)b^5c^2d^3 - 10(4A + B)ab^4cd^4 + (20A + 9B)a^2b^3d^5)i^3x - 10(2(20A + 3B)b^5c^2d^3 - 10(4A + B)ab^4cd^4 + (20A + 9B)a^2b^3d^5)i^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^6,x, algorithm="fricas")
```

```
[Out] 1/400*(20*(B*b^5*c*d^4 - B*a*b^4*d^5)*i^3*x^4 - 10*((20*A + B)*b^5*c^2*d^3 - 10*(4*A + B)*a*b^4*c*d^4 + (20*A + 9*B)*a^2*b^3*d^5)*i^3*x^3 - 10*(2*(20*A + 3*B)*b^5*c^3*d^2 - 15*(4*A + B)*a*b^4*c^2*d^3 + (20*A + 9*B)*a^3*b^2*d^5)*i^3*x^2 - 5*((60*A + 11*B)*b^5*c^4*d - 20*(4*A + B)*a*b^4*c^3*d^2 + (20*A + 9*B)*a^4*b*d^5)*i^3*x - (16*(5*A + B)*b^5*c^5 - 25*(4*A + B)*a*b^4*c^4*d + (20*A + 9*B)*a^5*d^5)*i^3 + 20*(B*b^5*d^5*i^3*x^5 + 5*B*a*b^4*d^5*i^3*x^4 - 10*(B*b^5*c^2*d^3 - 2*B*a*b^4*c*d^4)*i^3*x^3 - 10*(2*B*b^5*c^3*d^2 - 3*B*a*b^4*c^2*d^3)*i^3*x^2 - 5*(3*B*b^5*c^4*d - 4*B*a*b^4*c^3*d^2)*i^3*x - (4*B*b^5*c^5 - 5*B*a*b^4*c^4*d)*i^3)*log((b*e*x + a*e)/(d*x + c)))/(b^11*c^2 - 2*a*b^10*c*d + a^2*b^9*d^2)*g^6*x^5 + 5*(a*b^10*c^2 - 2*a^2*b^9*c*d + a^3*b^8*d^2)*g^6*x^4 + 10*(a^2*b^9*c^2 - 2*a^3*b^8*c*d + a^4*b^7*d^2)*g^6*x^3 + 10*(a^3*b^8*c^2 - 2*a^4*b^7*c*d + a^5*b^6*d^2)*g^6*x^2 + 5*(a^4*b^7*c^2 - 2*a^5*b^6*c*d + a^6*b^5*d^2)*g^6*x + (a^5*b^6*c^2 - 2*a^6*b^5*c*d + a^7*b^4*d^2)*g^6)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**6,x)
```

```
[Out] Timed out
```

**Giac [B]** time = 1.37452, size = 1183, normalized size = 6.54

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^6,x, algorithm="giac")
```

```
[Out] 1/20*B*d^5*log(b*x + a)/(b^6*c^2*g^6*i - 2*a*b^5*c*d*g^6*i + a^2*b^4*d^2*g^
6*i) - 1/20*B*d^5*log(d*x + c)/(b^6*c^2*g^6*i - 2*a*b^5*c*d*g^6*i + a^2*b^4
*d^2*g^6*i) + 1/20*(10*B*b^3*d^3*i*x^3 + 20*B*b^3*c*d^2*i*x^2 + 10*B*a*b^2*
d^3*i*x^2 + 15*B*b^3*c^2*d*i*x + 10*B*a*b^2*c*d^2*i*x + 5*B*a^2*b*d^3*i*x +
4*B*b^3*c^3*i + 3*B*a*b^2*c^2*d*i + 2*B*a^2*b*c*d^2*i + B*a^3*d^3*i)*log((
b*x + a)/(d*x + c))/(b^9*g^6*x^5 + 5*a*b^8*g^6*x^4 + 10*a^2*b^7*g^6*x^3 + 1
0*a^3*b^6*g^6*x^2 + 5*a^4*b^5*g^6*x + a^5*b^4*g^6) - 1/400*(20*B*b^4*d^4*i*
x^4 - 200*A*b^4*c*d^3*i*x^3 - 210*B*b^4*c*d^3*i*x^3 + 200*A*a*b^3*d^4*i*x^3
+ 290*B*a*b^3*d^4*i*x^3 - 400*A*b^4*c^2*d^2*i*x^2 - 460*B*b^4*c^2*d^2*i*x^
2 + 200*A*a*b^3*c*d^3*i*x^2 + 290*B*a*b^3*c*d^3*i*x^2 + 200*A*a^2*b^2*d^4*i
*x^2 + 290*B*a^2*b^2*d^4*i*x^2 - 300*A*b^4*c^3*d*i*x - 355*B*b^4*c^3*d*i*x
+ 100*A*a*b^3*c^2*d^2*i*x + 145*B*a*b^3*c^2*d^2*i*x + 100*A*a^2*b^2*c*d^3*i
*x + 145*B*a^2*b^2*c*d^3*i*x + 100*A*a^3*b*d^4*i*x + 145*B*a^3*b*d^4*i*x -
80*A*b^4*c^4*i - 96*B*b^4*c^4*i + 20*A*a*b^3*c^3*d*i + 29*B*a*b^3*c^3*d*i +
20*A*a^2*b^2*c^2*d^2*i + 29*B*a^2*b^2*c^2*d^2*i + 20*A*a^3*b*c*d^3*i + 29*
B*a^3*b*c*d^3*i + 20*A*a^4*d^4*i + 29*B*a^4*d^4*i)/(b^10*c*g^6*x^5 - a*b^9*
d*g^6*x^5 + 5*a*b^9*c*g^6*x^4 - 5*a^2*b^8*d*g^6*x^4 + 10*a^2*b^8*c*g^6*x^3
- 10*a^3*b^7*d*g^6*x^3 + 10*a^3*b^7*c*g^6*x^2 - 10*a^4*b^6*d*g^6*x^2 + 5*a^
4*b^6*c*g^6*x - 5*a^5*b^5*d*g^6*x + a^5*b^5*c*g^6 - a^6*b^4*d*g^6)
```



$$3.30 \quad \int \frac{(ci+dx)^3 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{(ag+bgx)^7} dx$$

**Optimal.** Leaf size=281

$$\frac{b^2 i^3 (c+dx)^6 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{6g^7 (a+bx)^6 (bc-ad)^3} - \frac{d^2 i^3 (c+dx)^4 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{4g^7 (a+bx)^4 (bc-ad)^3} + \frac{2bd i^3 (c+dx)^5 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{5g^7 (a+bx)^5 (bc-ad)^3} - \frac{36g^7 (a+bx)^6 (bc-ad)^3}{36g^7 (a+bx)^6 (bc-ad)^3}$$

[Out]  $-(B*d^2*i^3*(c+d*x)^4)/(16*(b*c-a*d)^3*g^7*(a+b*x)^4) + (2*b*B*d*i^3*(c+d*x)^5)/(25*(b*c-a*d)^3*g^7*(a+b*x)^5) - (b^2*B*i^3*(c+d*x)^6)/(36*(b*c-a*d)^3*g^7*(a+b*x)^6) - (d^2*i^3*(c+d*x)^4*(A+B*Log[(e*(a+b*x))/(c+d*x)]))/(4*(b*c-a*d)^3*g^7*(a+b*x)^4) + (2*b*d*i^3*(c+d*x)^5*(A+B*Log[(e*(a+b*x))/(c+d*x)]))/(5*(b*c-a*d)^3*g^7*(a+b*x)^5) - (b^2*i^3*(c+d*x)^6*(A+B*Log[(e*(a+b*x))/(c+d*x)]))/(6*(b*c-a*d)^3*g^7*(a+b*x)^6)$

**Rubi [A]** time = 0.975718, antiderivative size = 445, normalized size of antiderivative = 1.58, number of steps used = 18, number of rules used = 4, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.1$ , Rules used = {2528, 2525, 12, 44}

$$\frac{d^3 i^3 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{3b^4 g^7 (a+bx)^3} - \frac{3d^2 i^3 (bc-ad) \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{4b^4 g^7 (a+bx)^4} - \frac{3d i^3 (bc-ad)^2 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{5b^4 g^7 (a+bx)^5} - \frac{i^3 (bc-ad)^3}{6b^4 g^7 (a+bx)^6}$$

Antiderivative was successfully verified.

[In] Int[((c\*i + d\*i\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(a\*g + b\*g\*x)^7, x]

[Out]  $-(B*(b*c-a*d)^3*i^3)/(36*b^4*g^7*(a+b*x)^6) - (13*B*d*(b*c-a*d)^2*i^3)/(150*b^4*g^7*(a+b*x)^5) - (19*B*d^2*(b*c-a*d)*i^3)/(240*b^4*g^7*(a+b*x)^4) - (B*d^3*i^3)/(180*b^4*g^7*(a+b*x)^3) + (B*d^4*i^3)/(120*b^4*(b*c-a*d)*g^7*(a+b*x)^2) - (B*d^5*i^3)/(60*b^4*(b*c-a*d)^2*g^7*(a+b*x)) - (B*d^6*i^3*Log[a+b*x])/(60*b^4*(b*c-a*d)^3*g^7) - ((b*c-a*d)^3*i^3*(A+B*Log[(e*(a+b*x))/(c+d*x]]))/(6*b^4*g^7*(a+b*x)^6) - (3*d*(b*c-a*d)^2*i^3*(A+B*Log[(e*(a+b*x))/(c+d*x]]))/(5*b^4*g^7*(a+b*x)^5) - (3*d^2*(b*c-a*d)*i^3*(A+B*Log[(e*(a+b*x))/(c+d*x]]))/(4*b^4*g^7*(a+b*x)^4) - (d^3*i^3*(A+B*Log[(e*(a+b*x))/(c+d*x]]))/(3*b^4*g^7*(a+b*x)^3) + (B*d^6*i^3*Log[c+d*x])/(60*b^4*(b*c-a*d)^3*g^7)$

**Rule 2528**

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[ {u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x] }, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*
(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

### Rubi steps

$$\begin{aligned}
\int \frac{(30c + 30dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{(ag + bgx)^7} dx &= \int \left( \frac{27000(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^7 (a + bx)^7} + \frac{81000d(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^7 (a + bx)^6} \right) dx \\
&= \frac{(27000d^3) \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{(a+bx)^4} dx}{b^3 g^7} + \frac{(81000d^2(bc - ad)) \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{(a+bx)^5} dx}{b^3 g^7} + \dots \\
&= -\frac{4500(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^4 g^7 (a + bx)^6} - \frac{16200d(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^4 g^7 (a + bx)^5} \\
&= -\frac{4500(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^4 g^7 (a + bx)^6} - \frac{16200d(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^4 g^7 (a + bx)^5} \\
&= -\frac{4500(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^4 g^7 (a + bx)^6} - \frac{16200d(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^4 g^7 (a + bx)^5} \\
&= -\frac{750B(bc - ad)^3}{b^4 g^7 (a + bx)^6} - \frac{2340Bd(bc - ad)^2}{b^4 g^7 (a + bx)^5} - \frac{4275Bd^2(bc - ad)}{2b^4 g^7 (a + bx)^4} - \frac{150Bd^3}{b^4 g^7 (a + bx)^3}
\end{aligned}$$

**Mathematica [B]** time = 1.09176, size = 642, normalized size = 2.28

$$i^3 \left( 1200d^3(a + bx)^3(ad - bc)^3 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right) - 2700d^2(a + bx)^2(bc - ad)^4 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right) + 2160d(a + bx)(a + b^2x^2) \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right) \right)$$

Antiderivative was successfully verified.

[In] Integrate[(((c\*i + d\*i\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])))/(a\*g + b\*g\*x)^7, x]

[Out] (i^3\*(-100\*B\*(b\*c - a\*d)^6 + 432\*a\*B\*d\*(-(b\*c) + a\*d)^5 - 432\*b\*B\*d\*(b\*c - a\*d)^5\*x + 540\*a\*B\*d^2\*(b\*c - a\*d)^4\*(a + b\*x) + 120\*B\*d\*(b\*c - a\*d)^5\*(a + b\*x) + 540\*b\*B\*d^2\*(b\*c - a\*d)^4\*x\*(a + b\*x) - 825\*B\*d^2\*(b\*c - a\*d)^4\*(a + b\*x)^2 + 720\*a\*B\*d^3\*(-(b\*c) + a\*d)^3\*(a + b\*x)^2 - 720\*b\*B\*d^3\*(b\*c - a\*d)^3\*x\*(a + b\*x)^2 + 1080\*a\*B\*d^4\*(b\*c - a\*d)^2\*(a + b\*x)^3 + 700\*B\*d^3\*(b\*c - a\*d)^3\*(a + b\*x)^3 + 1080\*b\*B\*d^4\*(b\*c - a\*d)^2\*x\*(a + b\*x)^3 - 1050\*B\*d^4\*(b\*c - a\*d)^2\*(a + b\*x)^4 + 2160\*a\*B\*d^5\*(-(b\*c) + a\*d)\*(a + b\*x)^4 - 2160\*b\*B\*d^5\*(b\*c - a\*d)\*x\*(a + b\*x)^4 + 2100\*B\*d^5\*(b\*c - a\*d)\*(a + b\*x)^5 - 2160\*a\*B\*d^6\*(a + b\*x)^5\*Log[a + b\*x] - 2160\*b\*B\*d^6\*x\*(a + b\*x)^5\*Log[a + b\*x] + 2100\*B\*d^6\*(a + b\*x)^6\*Log[a + b\*x] - 600\*(b\*c - a\*d)^6\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) + 2160\*d\*(-(b\*c) + a\*d)^5\*(a + b\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])

$$\frac{e*(a + b*x))/(c + d*x)] - 2700*d^2*(b*c - a*d)^4*(a + b*x)^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]) + 1200*d^3*(-(b*c) + a*d)^3*(a + b*x)^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]) + 2160*a*B*d^6*(a + b*x)^5*\text{Log}[c + d*x] + 2160*b*B*d^6*x*(a + b*x)^5*\text{Log}[c + d*x] - 2100*B*d^6*(a + b*x)^6*\text{Log}[c + d*x])]/(600*b^4*(b*c - a*d)^3*g^7*(a + b*x)^6)$$

**Maple [B]** time = 0.053, size = 1262, normalized size = 4.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In]  $\text{int}((d*i*x+c*i)^3*(A+B*\ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^7, x)$

[Out]  $\frac{1}{4}e^4d^3i^3/(a*d-b*c)^4/g^7A/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4a-1/4e^4d^2i^3/(a*d-b*c)^4/g^7A/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4b*c-2/5e^5d^2i^3/(a*d-b*c)^4/g^7A*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5a+2/5e^5d^2i^3/(a*d-b*c)^4/g^7A*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5c+1/6e^6d^2i^3/(a*d-b*c)^4/g^7A*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^6a-1/6e^6i^3/(a*d-b*c)^4/g^7A*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^6c+1/4e^4d^3i^3/(a*d-b*c)^4/g^7B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-1/4e^4d^2i^3/(a*d-b*c)^4/g^7B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+1/16e^4d^3i^3/(a*d-b*c)^4/g^7B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4a-1/16e^4d^2i^3/(a*d-b*c)^4/g^7B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4b*c-2/5e^5d^2i^3/(a*d-b*c)^4/g^7B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+2/5e^5d^2i^3/(a*d-b*c)^4/g^7B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-2/25e^5d^2i^3/(a*d-b*c)^4/g^7B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5a+2/25e^5d^2i^3/(a*d-b*c)^4/g^7B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5c+1/6e^6d^2i^3/(a*d-b*c)^4/g^7B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^6*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-1/6e^6i^3/(a*d-b*c)^4/g^7B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^6*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+1/36e^6d^2i^3/(a*d-b*c)^4/g^7B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^6a-1/36e^6i^3/(a*d-b*c)^4/g^7B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^6c$

**Maxima [B]** time = 3.32622, size = 7457, normalized size = 26.54

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)^7,x, algorithm="maxima")

[Out] 
$$-1/3600*B*d^3*i^3*(60*(20*b^3*x^3 + 15*a*b^2*x^2 + 6*a^2*b*x + a^3)*\log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^10*g^7*x^6 + 6*a*b^9*g^7*x^5 + 15*a^2*b^8*g^7*x^4 + 20*a^3*b^7*g^7*x^3 + 15*a^4*b^6*g^7*x^2 + 6*a^5*b^5*g^7*x + a^6*b^4*g^7) + (57*a^3*b^5*c^5 - 405*a^4*b^4*c^4*d + 1470*a^5*b^3*c^3*d^2 - 730*a^6*b^2*c^2*d^3 + 245*a^7*b*c*d^4 - 37*a^8*d^5 + 60*(20*b^8*c^3*d^2 - 15*a*b^7*c^2*d^3 + 6*a^2*b^6*c*d^4 - a^3*b^5*d^5)*x^5 - 30*(20*b^8*c^4*d - 235*a*b^7*c^3*d^2 + 171*a^2*b^6*c^2*d^3 - 67*a^3*b^5*c*d^4 + 11*a^4*b^4*d^5)*x^4 + 20*(20*b^8*c^5 - 175*a*b^7*c^4*d + 866*a^2*b^6*c^3*d^2 - 604*a^3*b^5*c^2*d^3 + 230*a^4*b^4*c*d^4 - 37*a^5*b^3*d^5)*x^3 + 15*(35*a*b^7*c^5 - 271*a^2*b^6*c^4*d + 1128*a^3*b^5*c^3*d^2 - 700*a^4*b^4*c^2*d^3 + 245*a^5*b^3*c*d^4 - 37*a^6*b^2*d^5)*x^2 + 6*(47*a^2*b^6*c^5 - 345*a^3*b^5*c^4*d + 1320*a^4*b^4*c^3*d^2 - 730*a^5*b^3*c^2*d^3 + 245*a^6*b^2*c*d^4 - 37*a^7*b*d^5)*x)/((b^15*c^5 - 5*a*b^14*c^4*d + 10*a^2*b^13*c^3*d^2 - 10*a^3*b^12*c^2*d^3 + 5*a^4*b^11*c*d^4 - a^5*b^10*d^5)*g^7*x^6 + 6*(a*b^14*c^5 - 5*a^2*b^13*c^4*d + 10*a^3*b^12*c^3*d^2 - 10*a^4*b^11*c^2*d^3 + 5*a^5*b^10*c*d^4 - a^6*b^9*d^5)*g^7*x^5 + 15*(a^2*b^13*c^5 - 5*a^3*b^12*c^4*d + 10*a^4*b^11*c^3*d^2 - 10*a^5*b^10*c^2*d^3 + 5*a^6*b^9*c*d^4 - a^7*b^8*d^5)*g^7*x^4 + 20*(a^3*b^12*c^5 - 5*a^4*b^11*c^4*d + 10*a^5*b^10*c^3*d^2 - 10*a^6*b^9*c^2*d^3 + 5*a^7*b^8*c*d^4 - a^8*b^7*d^5)*g^7*x^3 + 15*(a^4*b^11*c^5 - 5*a^5*b^10*c^4*d + 10*a^6*b^9*c^3*d^2 - 10*a^7*b^8*c^2*d^3 + 5*a^8*b^7*c*d^4 - a^9*b^6*d^5)*g^7*x^2 + 6*(a^5*b^10*c^5 - 5*a^6*b^9*c^4*d + 10*a^7*b^8*c^3*d^2 - 10*a^8*b^7*c^2*d^3 + 5*a^9*b^6*c*d^4 - a^10*b^5*d^5)*g^7*x + (a^6*b^9*c^5 - 5*a^7*b^8*c^4*d + 10*a^8*b^7*c^3*d^2 - 10*a^9*b^6*c^2*d^3 + 5*a^10*b^5*c*d^4 - a^11*b^4*d^5)*g^7) + 60*(20*b^3*c^3*d^3 - 15*a*b^2*c^2*d^4 + 6*a^2*b*c*d^5 - a^3*d^6)*\log(b*x + a)/((b^10*c^6 - 6*a*b^9*c^5*d + 15*a^2*b^8*c^4*d^2 - 20*a^3*b^7*c^3*d^3 + 15*a^4*b^6*c^2*d^4 - 6*a^5*b^5*c*d^5 + a^6*b^4*d^6)*g^7) - 60*(20*b^3*c^3*d^3 - 15*a*b^2*c^2*d^4 + 6*a^2*b*c*d^5 - a^3*d^6)*\log(d*x + c)/((b^10*c^6 - 6*a*b^9*c^5*d + 15*a^2*b^8*c^4*d^2 - 20*a^3*b^7*c^3*d^3 + 15*a^4*b^6*c^2*d^4 - 6*a^5*b^5*c*d^5 + a^6*b^4*d^6)*g^7)) - 1/1200*B*c*d^2*i^3*(60*(15*b^2*x^2 + 6*a*b*x + a^2)*\log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^9*g^7*x^6 + 6*a*b^8*g^7*x^5 + 15*a^2*b^7*g^7*x^4 + 20*a^3*b^6*g^7*x^3 + 15*a^4*b^5*g^7*x^2 + 6*a^5*b^4*g^7*x + a^6*b^3*g^7) + (37*a^2*b^5*c^5 - 245*a^3*b^4*c^4*d + 730*a^4*b^3*c^3*d^2 - 1470*a^5*b^2*c^2*d^3 + 405*a^6*b*c*d^4 - 57*a^7*d^5 - 60*(15*b^7*c^2*d^3 - 6*a*b^6*c*d^4 + a^2*b^5*d^5)*x^5 + 30*(15*b^7*c^3*d^2 - 171*a*b^6*c^2*d^3 + 67*a^2*b^5*c*d^4 - 11*a^3*b^4*d^5)*x^4 - 20*(15*b^7*c^4*d - 126*a*b^6*c^3*d^2 + 604*a^2*b^5*c^2*d^3 - 230*a^3*b^4*c*d^4 + 37*a^4*b^3*d^5)*x^3 + 15*(15*b^7*c^5 - 111*a*b^6*c^4*d + 388*a^2*b^5*c^3*d^2 - 1000*a^3*b^4*c^2*d^3 + 365*a^4*b^3*c*d^4 - 57*a^5*b^2*d^5)*x^2 + 6*(27*a*b^6*c^5 - 185*a^2*b^5*c^4*d + 580*a^3*b^4*c^3*d^2 - 1270*a^4*b^3*c^2*d^3 + 405*a^5*b^2*c*d^4 - 57*a^6*b*d^5)*x)/((b^14*c^5 - 5*a*b^13*c^4*d + 10*a^2*b^12*c^3*d^2 - 10*a^3*b^11*c^2*d^3 + 5*a^4*b^10*c*d^4 - a^5*b^9*d^5)*g^7$$

$$\begin{aligned}
& *x^6 + 6*(a*b^{13}*c^5 - 5*a^2*b^{12}*c^4*d + 10*a^3*b^{11}*c^3*d^2 - 10*a^4*b^{10} \\
& *c^2*d^3 + 5*a^5*b^9*c*d^4 - a^6*b^8*d^5)*g^7*x^5 + 15*(a^2*b^{12}*c^5 - 5*a^3 \\
& *b^{11}*c^4*d + 10*a^4*b^{10}*c^3*d^2 - 10*a^5*b^9*c^2*d^3 + 5*a^6*b^8*c*d^4 - \\
& a^7*b^7*d^5)*g^7*x^4 + 20*(a^3*b^{11}*c^5 - 5*a^4*b^{10}*c^4*d + 10*a^5*b^9*c^3 \\
& *d^2 - 10*a^6*b^8*c^2*d^3 + 5*a^7*b^7*c*d^4 - a^8*b^6*d^5)*g^7*x^3 + 15*(a^4 \\
& *b^{10}*c^5 - 5*a^5*b^9*c^4*d + 10*a^6*b^8*c^3*d^2 - 10*a^7*b^7*c^2*d^3 + 5 \\
& *a^8*b^6*c*d^4 - a^9*b^5*d^5)*g^7*x^2 + 6*(a^5*b^9*c^5 - 5*a^6*b^8*c^4*d + \\
& 10*a^7*b^7*c^3*d^2 - 10*a^8*b^6*c^2*d^3 + 5*a^9*b^5*c*d^4 - a^{10}*b^4*d^5)*g \\
& ^7*x + (a^6*b^8*c^5 - 5*a^7*b^7*c^4*d + 10*a^8*b^6*c^3*d^2 - 10*a^9*b^5*c^2 \\
& *d^3 + 5*a^{10}*b^4*c*d^4 - a^{11}*b^3*d^5)*g^7) - 60*(15*b^2*c^2*d^4 - 6*a*b*c \\
& *d^5 + a^2*d^6)*\log(b*x + a)/((b^9*c^6 - 6*a*b^8*c^5*d + 15*a^2*b^7*c^4*d^2 \\
& - 20*a^3*b^6*c^3*d^3 + 15*a^4*b^5*c^2*d^4 - 6*a^5*b^4*c*d^5 + a^6*b^3*d^6) \\
& *g^7) + 60*(15*b^2*c^2*d^4 - 6*a*b*c*d^5 + a^2*d^6)*\log(d*x + c)/((b^9*c^6 \\
& - 6*a*b^8*c^5*d + 15*a^2*b^7*c^4*d^2 - 20*a^3*b^6*c^3*d^3 + 15*a^4*b^5*c^2* \\
& d^4 - 6*a^5*b^4*c*d^5 + a^6*b^3*d^6)*g^7)) - 1/600*B*c^2*d*i^3*(60*(6*b*x + \\
& a)*\log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^8*g^7*x^6 + 6*a*b^7*g^7*x^5 + 1 \\
& 5*a^2*b^6*g^7*x^4 + 20*a^3*b^5*g^7*x^3 + 15*a^4*b^4*g^7*x^2 + 6*a^5*b^3*g^7 \\
& *x + a^6*b^2*g^7) + (22*a*b^5*c^5 - 140*a^2*b^4*c^4*d + 385*a^3*b^3*c^3*d^2 \\
& - 615*a^4*b^2*c^2*d^3 + 735*a^5*b*c*d^4 - 87*a^6*d^5 + 60*(6*b^6*c*d^4 - a \\
& *b^5*d^5)*x^5 - 30*(6*b^6*c^2*d^3 - 67*a*b^5*c*d^4 + 11*a^2*b^4*d^5)*x^4 + \\
& 20*(6*b^6*c^3*d^2 - 49*a*b^5*c^2*d^3 + 230*a^2*b^4*c*d^4 - 37*a^3*b^3*d^5)* \\
& x^3 - 15*(6*b^6*c^4*d - 43*a*b^5*c^3*d^2 + 145*a^2*b^4*c^2*d^3 - 365*a^3*b^3 \\
& *c*d^4 + 57*a^4*b^2*d^5)*x^2 + 6*(12*b^6*c^5 - 80*a*b^5*c^4*d + 235*a^2*b^4 \\
& *c^3*d^2 - 415*a^3*b^3*c^2*d^3 + 585*a^4*b^2*c*d^4 - 87*a^5*b*d^5)*x)/((b^13 \\
& *c^5 - 5*a*b^{12}*c^4*d + 10*a^2*b^{11}*c^3*d^2 - 10*a^3*b^{10}*c^2*d^3 + 5*a^4 \\
& *b^9*c*d^4 - a^5*b^8*d^5)*g^7*x^6 + 6*(a*b^{12}*c^5 - 5*a^2*b^{11}*c^4*d + 10*a^3 \\
& *b^{10}*c^3*d^2 - 10*a^4*b^9*c^2*d^3 + 5*a^5*b^8*c*d^4 - a^6*b^7*d^5)*g^7*x^5 \\
& + 15*(a^2*b^{11}*c^5 - 5*a^3*b^{10}*c^4*d + 10*a^4*b^9*c^3*d^2 - 10*a^5*b^8*c^2 \\
& *d^3 + 5*a^6*b^7*c*d^4 - a^7*b^6*d^5)*g^7*x^4 + 20*(a^3*b^{10}*c^5 - 5*a^4 \\
& *b^9*c^4*d + 10*a^5*b^8*c^3*d^2 - 10*a^6*b^7*c^2*d^3 + 5*a^7*b^6*c*d^4 - a^8 \\
& *b^5*d^5)*g^7*x^3 + 15*(a^4*b^9*c^5 - 5*a^5*b^8*c^4*d + 10*a^6*b^7*c^3*d^2 \\
& - 10*a^7*b^6*c^2*d^3 + 5*a^8*b^5*c*d^4 - a^9*b^4*d^5)*g^7*x^2 + 6*(a^5*b^8 \\
& *c^5 - 5*a^6*b^7*c^4*d + 10*a^7*b^6*c^3*d^2 - 10*a^8*b^5*c^2*d^3 + 5*a^9*b^4 \\
& *c*d^4 - a^{10}*b^3*d^5)*g^7*x + (a^6*b^7*c^5 - 5*a^7*b^6*c^4*d + 10*a^8*b^5 \\
& *c^3*d^2 - 10*a^9*b^4*c^2*d^3 + 5*a^{10}*b^3*c*d^4 - a^{11}*b^2*d^5)*g^7) + 60* \\
& (6*b*c*d^5 - a*d^6)*\log(b*x + a)/((b^8*c^6 - 6*a*b^7*c^5*d + 15*a^2*b^6*c^4 \\
& *d^2 - 20*a^3*b^5*c^3*d^3 + 15*a^4*b^4*c^2*d^4 - 6*a^5*b^3*c*d^5 + a^6*b^2* \\
& d^6)*g^7) - 60*(6*b*c*d^5 - a*d^6)*\log(d*x + c)/((b^8*c^6 - 6*a*b^7*c^5*d + \\
& 15*a^2*b^6*c^4*d^2 - 20*a^3*b^5*c^3*d^3 + 15*a^4*b^4*c^2*d^4 - 6*a^5*b^3*c \\
& *d^5 + a^6*b^2*d^6)*g^7)) + 1/360*B*c^3*i^3*((60*b^5*d^5*x^5 - 10*b^5*c^5 + \\
& 62*a*b^4*c^4*d - 163*a^2*b^3*c^3*d^2 + 237*a^3*b^2*c^2*d^3 - 213*a^4*b*c*d^4 \\
& + 147*a^5*d^5 - 30*(b^5*c*d^4 - 11*a*b^4*d^5)*x^4 + 20*(b^5*c^2*d^3 - 8* \\
& a*b^4*c*d^4 + 37*a^2*b^3*d^5)*x^3 - 15*(b^5*c^3*d^2 - 7*a*b^4*c^2*d^3 + 23* \\
& a^2*b^3*c*d^4 - 57*a^3*b^2*d^5)*x^2 + 6*(2*b^5*c^4*d - 13*a*b^4*c^3*d^2 + 3 \\
& 7*a^2*b^3*c^2*d^3 - 63*a^3*b^2*c*d^4 + 87*a^4*b*d^5)*x)/((b^{12}*c^5 - 5*a*b^
\end{aligned}$$

$$\begin{aligned}
& 11c^4d + 10a^2b^{10}c^3d^2 - 10a^3b^9c^2d^3 + 5a^4b^8cd^4 - a^5b^7d^5)g^7x^6 + 6(a^2b^{11}c^5 - 5a^2b^{10}c^4d + 10a^3b^9c^3d^2 - \\
& 10a^4b^8c^2d^3 + 5a^5b^7cd^4 - a^6b^6d^5)g^7x^5 + 15(a^2b^{10}c^5 - 5a^3b^9c^4d + 10a^4b^8c^3d^2 - 10a^5b^7c^2d^3 + 5a^6b^6c^d^4 - a^7b^5d^5)g^7x^4 + 20(a^3b^9c^5 - 5a^4b^8c^4d + 10a^5b^7c^3d^2 - 10a^6b^6c^2d^3 + 5a^7b^5cd^4 - a^8b^4d^5)g^7x^3 \\
& + 15(a^4b^8c^5 - 5a^5b^7c^4d + 10a^6b^6c^3d^2 - 10a^7b^5c^2d^3 + 5a^8b^4cd^4 - a^9b^3d^5)g^7x^2 + 6(a^5b^7c^5 - 5a^6b^6c^4d + 10a^7b^5c^3d^2 - 10a^8b^4c^2d^3 + 5a^9b^3cd^4 - a^{10}b^2d^5)g^7x + (a^6b^6c^5 - 5a^7b^5c^4d + 10a^8b^4c^3d^2 - 10a^9b^3c^2d^3 + 5a^{10}b^2cd^4 - a^{11}bd^5)g^7) - 60\log(bex/(dx + c) + \\
& a/(dx + c))/(b^7g^7x^6 + 6ab^6g^7x^5 + 15a^2b^5g^7x^4 + 20a^3b^4g^7x^3 + 15a^4b^3g^7x^2 + 6a^5b^2g^7x + a^6bg^7) + 60d^6\log(bx + a)/((b^7c^6 - 6ab^6c^5d + 15a^2b^5c^4d^2 - 20a^3b^4c^3d^3 + 15a^4b^3c^2d^4 - 6a^5b^2cd^5 + a^6bd^6)g^7) - 60d^6\log(dx + c)/((b^7c^6 - 6ab^6c^5d + 15a^2b^5c^4d^2 - 20a^3b^4c^3d^3 + 15a^4b^3c^2d^4 - 6a^5b^2cd^5 + a^6bd^6)g^7) - 1/10(6b^6x + a)A^c^2d^i^3/(b^8g^7x^6 + 6ab^7g^7x^5 + 15a^2b^6g^7x^4 + 20a^3b^5g^7x^3 + 15a^4b^4g^7x^2 + 6a^5b^3g^7x + a^6b^2g^7) - 1/20(15b^2x^2 + 6abx + a^2)A^cd^2i^3/(b^9g^7x^6 + 6ab^8g^7x^5 + 15a^2b^7g^7x^4 + 20a^3b^6g^7x^3 + 15a^4b^5g^7x^2 + 6a^5b^4g^7x + a^6b^3g^7) - 1/60(20b^3x^3 + 15ab^2x^2 + 6a^2bx + a^3)A^d^3i^3/(b^{10}g^7x^6 + 6ab^9g^7x^5 + 15a^2b^8g^7x^4 + 20a^3b^7g^7x^3 + 15a^4b^6g^7x^2 + 6a^5b^5g^7x + a^6b^4g^7) - 1/6A^c^3i^3/(b^7g^7x^6 + 6ab^6g^7x^5 + 15a^2b^5g^7x^4 + 20a^3b^4g^7x^3 + 15a^4b^3g^7x^2 + 6a^5b^2g^7x + a^6bg^7)
\end{aligned}$$

**Fricas [B]** time = 0.59535, size = 2057, normalized size = 7.32

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)^7,x, algorithm="fricas")

[Out]  $-1/3600(60(Bb^6cd^5 - B^2ab^5d^6)i^3x^5 - 30(Bb^6c^2d^4 - 12B^2ab^5cd^5 + 11B^2a^2b^4d^6)i^3x^4 + 20((60A + B)b^6c^3d^3 - 9(20A + B)ab^5c^2d^4 + 45(4A + B)a^2b^4cd^5 - (60A + 37B)a^3b^3d^6)i^3x^3 + 15((180A + 19B)b^6c^4d^2 - 24(20A + 3B)ab^5c^3d^3 + 90(4A + B)a^2b^4c^2d^4 - (60A + 37B)a^4b^2d^6)i^3x^2 + 6(4(90A + 13B)b^6c^5d - 15(60A + 11B)ab^5c^4d^2 + 150(4A + B$

```

)*a^2*b^4*c^3*d^3 - (60*A + 37*B)*a^5*b*d^6)*i^3*x + (100*(6*A + B)*b^6*c^6
- 288*(5*A + B)*a*b^5*c^5*d + 225*(4*A + B)*a^2*b^4*c^4*d^2 - (60*A + 37*B
)*a^6*d^6)*i^3 + 60*(B*b^6*d^6*i^3*x^6 + 6*B*a*b^5*d^6*i^3*x^5 + 15*B*a^2*b
^4*d^6*i^3*x^4 + 20*(B*b^6*c^3*d^3 - 3*B*a*b^5*c^2*d^4 + 3*B*a^2*b^4*c*d^5)
*i^3*x^3 + 15*(3*B*b^6*c^4*d^2 - 8*B*a*b^5*c^3*d^3 + 6*B*a^2*b^4*c^2*d^4)*i
^3*x^2 + 6*(6*B*b^6*c^5*d - 15*B*a*b^5*c^4*d^2 + 10*B*a^2*b^4*c^3*d^3)*i^3*
x + (10*B*b^6*c^6 - 24*B*a*b^5*c^5*d + 15*B*a^2*b^4*c^4*d^2)*i^3)*log((b*e*
x + a*e)/(d*x + c)))/((b^13*c^3 - 3*a*b^12*c^2*d + 3*a^2*b^11*c*d^2 - a^3*b
^10*d^3)*g^7*x^6 + 6*(a*b^12*c^3 - 3*a^2*b^11*c^2*d + 3*a^3*b^10*c*d^2 - a^
4*b^9*d^3)*g^7*x^5 + 15*(a^2*b^11*c^3 - 3*a^3*b^10*c^2*d + 3*a^4*b^9*c*d^2
- a^5*b^8*d^3)*g^7*x^4 + 20*(a^3*b^10*c^3 - 3*a^4*b^9*c^2*d + 3*a^5*b^8*c*d
^2 - a^6*b^7*d^3)*g^7*x^3 + 15*(a^4*b^9*c^3 - 3*a^5*b^8*c^2*d + 3*a^6*b^7*c
*d^2 - a^7*b^6*d^3)*g^7*x^2 + 6*(a^5*b^8*c^3 - 3*a^6*b^7*c^2*d + 3*a^7*b^6*
c*d^2 - a^8*b^5*d^3)*g^7*x + (a^6*b^7*c^3 - 3*a^7*b^6*c^2*d + 3*a^8*b^5*c*d
^2 - a^9*b^4*d^3)*g^7)

```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**7,x)
```

```
[Out] Timed out
```

**Giac [B]** time = 1.41452, size = 1678, normalized size = 5.97

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^7,x, algo
rithm="giac")
```

```
[Out] -1/60*B*d^6*log(b*x + a)/(b^7*c^3*g^7*i - 3*a*b^6*c^2*d*g^7*i + 3*a^2*b^5*c
*d^2*g^7*i - a^3*b^4*d^3*g^7*i) + 1/60*B*d^6*log(d*x + c)/(b^7*c^3*g^7*i -
3*a*b^6*c^2*d*g^7*i + 3*a^2*b^5*c*d^2*g^7*i - a^3*b^4*d^3*g^7*i) + 1/60*(20
*B*b^3*d^3*i*x^3 + 45*B*b^3*c*d^2*i*x^2 + 15*B*a*b^2*d^3*i*x^2 + 36*B*b^3*c
```



$$\begin{aligned}
& ^2*d*i*x + 18*B*a*b^2*c*d^2*i*x + 6*B*a^2*b*d^3*i*x + 10*B*b^3*c^3*i + 6*B* \\
& a*b^2*c^2*d*i + 3*B*a^2*b*c*d^2*i + B*a^3*d^3*i)*\log((b*x + a)/(d*x + c))/ \\
& (b^{10}*g^7*x^6 + 6*a*b^9*g^7*x^5 + 15*a^2*b^8*g^7*x^4 + 20*a^3*b^7*g^7*x^3 + \\
& 15*a^4*b^6*g^7*x^2 + 6*a^5*b^5*g^7*x + a^6*b^4*g^7) - 1/3600*(60*B*b^5*d^5* \\
& x^5 - 30*B*b^5*c*d^4*x^4 + 330*B*a*b^4*d^5*x^4 + 1200*A*b^5*c^2*d^3*x^3 + 1 \\
& 220*B*b^5*c^2*d^3*x^3 - 2400*A*a*b^4*c*d^4*x^3 - 2560*B*a*b^4*c*d^4*x^3 + 1 \\
& 200*A*a^2*b^3*d^5*x^3 + 1940*B*a^2*b^3*d^5*x^3 + 2700*A*b^5*c^3*d^2*x^2 + 2 \\
& 985*B*b^5*c^3*d^2*x^2 - 4500*A*a*b^4*c^2*d^3*x^2 - 5295*B*a*b^4*c^2*d^3*x^2 \\
& + 900*A*a^2*b^3*c*d^4*x^2 + 1455*B*a^2*b^3*c*d^4*x^2 + 900*A*a^3*b^2*d^5*x \\
& ^2 + 1455*B*a^3*b^2*d^5*x^2 + 2160*A*b^5*c^4*d*x + 2472*B*b^5*c^4*d*x - 324 \\
& 0*A*a*b^4*c^3*d^2*x - 3918*B*a*b^4*c^3*d^2*x + 360*A*a^2*b^3*c^2*d^3*x + 58 \\
& 2*B*a^2*b^3*c^2*d^3*x + 360*A*a^3*b^2*c*d^4*x + 582*B*a^3*b^2*c*d^4*x + 360 \\
& *A*a^4*b*d^5*x + 582*B*a^4*b*d^5*x + 600*A*b^5*c^5 + 700*B*b^5*c^5 - 840*A* \\
& a*b^4*c^4*d - 1028*B*a*b^4*c^4*d + 60*A*a^2*b^3*c^3*d^2 + 97*B*a^2*b^3*c^3* \\
& d^2 + 60*A*a^3*b^2*c^2*d^3 + 97*B*a^3*b^2*c^2*d^3 + 60*A*a^4*b*c*d^4 + 97*B \\
& *a^4*b*c*d^4 + 60*A*a^5*d^5 + 97*B*a^5*d^5)/(b^{12}*c^2*g^7*i*x^6 - 2*a*b^{11}* \\
& c*d*g^7*i*x^6 + a^2*b^{10}*d^2*g^7*i*x^6 + 6*a*b^{11}*c^2*g^7*i*x^5 - 12*a^2*b^{10}* \\
& c*d*g^7*i*x^5 + 6*a^3*b^9*d^2*g^7*i*x^5 + 15*a^2*b^{10}*c^2*g^7*i*x^4 - 30 \\
& *a^3*b^9*c*d*g^7*i*x^4 + 15*a^4*b^8*d^2*g^7*i*x^4 + 20*a^3*b^9*c^2*g^7*i*x^3 \\
& - 40*a^4*b^8*c*d*g^7*i*x^3 + 20*a^5*b^7*d^2*g^7*i*x^3 + 15*a^4*b^8*c^2*g^7 \\
& *i*x^2 - 30*a^5*b^7*c*d*g^7*i*x^2 + 15*a^6*b^6*d^2*g^7*i*x^2 + 6*a^5*b^7*c^2 \\
& *g^7*i*x - 12*a^6*b^6*c*d*g^7*i*x + 6*a^7*b^5*d^2*g^7*i*x + a^6*b^6*c^2*g^7 \\
& *i - 2*a^7*b^5*c*d*g^7*i + a^8*b^4*d^2*g^7*i)
\end{aligned}$$

$$3.31 \quad \int \frac{(ag+bgx)^3 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{ci+dx} dx$$

**Optimal.** Leaf size=252

$$\frac{Bg^3(bc-ad)^3 \text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)}{d^4i} - \frac{g^3(a+bx)^2(bc-ad) \left( 3B \log\left(\frac{e(a+bx)}{c+dx}\right) + 3A + B \right)}{6d^2i} + \frac{g^3(a+bx)(bc-ad)^2 \left( 6B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{6d^3i}$$

[Out]  $(g^3(a+bx)^3(A+B \text{Log}[(e(a+bx))/(c+dx)]))/(3d^3i) - ((b^3c - a^3d)g^3(a+bx)^2(3A+B+3B \text{Log}[(e(a+bx))/(c+dx)]))/(6d^2i) + ((b^3c - a^3d)^2g^3(a+bx)(6A+5B+6B \text{Log}[(e(a+bx))/(c+dx)]))/(6d^3i) + ((b^3c - a^3d)^3g^3 \text{Log}[(b^3c - a^3d)/(b(c+dx))](6A+11B+6B \text{Log}[(e(a+bx))/(c+dx)]))/(6d^4i) + (B(b^3c - a^3d)^3g^3 \text{PolyLog}[2, (d(a+bx))/(b(c+dx))])/(d^4i)$

**Rubi [A]** time = 0.625548, antiderivative size = 408, normalized size of antiderivative = 1.62, number of steps used = 23, number of rules used = 13, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.325$ , Rules used = {2528, 2486, 31, 2525, 12, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{Bg^3(bc-ad)^3 \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{d^4i} - \frac{g^3(a+bx)^2(bc-ad) \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{2d^2i} - \frac{g^3(bc-ad)^3 \log(ci+dx) \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{d^4i}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[(a*g + b*g*x)^3(A + B*\text{Log}[(e*(a + b*x))/(c + d*x]))/(c*i + d*i*x), x]$

[Out]  $(A*b*(b^3c - a^3d)^2g^3x)/(d^3i) + (5*b*B*(b^3c - a^3d)^2g^3x)/(6d^3i) - (B*(b^3c - a^3d)g^3(a+bx)^2)/(6d^2i) + (B*(b^3c - a^3d)^2g^3(a+bx) \text{Log}[(e(a+bx))/(c+dx)])/(d^3i) - ((b^3c - a^3d)g^3(a+bx)^2(A + B \text{Log}[(e(a+bx))/(c+dx)]))/(2d^2i) + (g^3(a+bx)^3(A + B \text{Log}[(e(a+bx))/(c+dx)]))/(3d^3i) - (11*B*(b^3c - a^3d)^3g^3 \text{Log}[c+dx])/(6d^4i) - (B*(b^3c - a^3d)^3g^3 \text{Log}[i*(c+dx)]^2)/(2d^4i) + (B*(b^3c - a^3d)^3g^3 \text{Log}[-((d(a+bx))/(b^3c - a^3d))] \text{Log}[c*i + d*i*x])/(d^4i) - ((b^3c - a^3d)^3g^3(A + B \text{Log}[(e(a+bx))/(c+dx)]) \text{Log}[c*i + d*i*x])/(d^4i) + (B*(b^3c - a^3d)^3g^3 \text{PolyLog}[2, (b(c+dx))/(b^3c - a^3d)])/(d^4i)$

**Rule 2528**

$\text{Int}[(a_. + \text{Log}[c_.*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x\_Symbol] := \text{With}[\{u = \text{ExpandIntegrand}[(a + b*\text{Log}[c*Rfx^p])^n, RGx, x]\}, \text{Int}[u, x] /; \text{SumQ}[u]] /; \text{FreeQ}\{a, b, c, p, x\} \&\& \text{RationalFunctionQ}[Rfx, x] \&\& \text{RationalFunctionQ}[RGx, x]$

onQ[RGx, x] && IGtQ[n, 0]

### Rule 2486

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.))  
^(r\_.)]^(s\_.), x\_Symbol] := Simp[((a + b\*x)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)  
^q]^r]^s)/b, x] + Dist[(q\*r\*s\*(b\*c - a\*d))/b, Int[Log[e\*(f\*(a + b\*x)^p\*(c +  
d\*x)^q]^r]^(s - 1)/(c + d\*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s  
, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]

### Rule 31

Int[((a\_.) + (b\_.)\*(x\_))^-1), x\_Symbol] := Simp[Log[RemoveContent[a + b\*x,  
x]]/b, x] /; FreeQ[{a, b}, x]

### Rule 2525

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.))\*((d\_.) + (e\_.)\*(x\_))^(m\_.  
) , x\_Symbol] := Simp[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^n)/(e\*(m + 1))  
, x] - Dist[(b\*n\*p)/(e\*(m + 1)), Int[SimplifyIntegrand[((d + e\*x)^(m + 1)\*(  
a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d  
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||  
IntegerQ[m]) && NeQ[m, -1]

### Rule 12

Int[(a\_)\*(u\_), x\_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match  
Q[u, (b\_)\*(v\_)] /; FreeQ[b, x]

### Rule 43

Int[((a\_.) + (b\_.)\*(x\_))^(m\_.))\*((c\_.) + (d\_.)\*(x\_))^(n\_.), x\_Symbol] := Int  
[ExpandIntegrand[(a + b\*x)^m\*(c + d\*x)^n, x], x] /; FreeQ[{a, b, c, d, n},  
x] && NeQ[b\*c - a\*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && Le  
Q[7\*m + 4\*n + 4, 0]) || LtQ[9\*m + 5\*(n + 1), 0] || GtQ[m + n + 2, 0])

### Rule 2524

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.))/((d\_.) + (e\_.)\*(x\_)), x\_S  
ymbol] := Simp[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^n)/e, x] - Dist[(b\*n\*p)/e  
, Int[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x] /;  
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

### Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)
]^n))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)]^(n_.)]*(b_.)/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rubi steps

$$\begin{aligned}
\int \frac{(ag + bgx)^3 \left( A + B \log \left( \frac{e^{(a+bx)}}{c+dx} \right) \right)}{31c + 31dx} dx &= \int \left( \frac{b(bc - ad)^2 g^3 \left( A + B \log \left( \frac{e^{(a+bx)}}{c+dx} \right) \right)}{31d^3} + \frac{(-bc + ad)^3 g^3 \left( A + B \log \left( \frac{e^{(a+bx)}}{c+dx} \right) \right)}{d^3(31c + 31dx)} \right) dx \\
&= \frac{(bg) \int (ag + bgx)^2 \left( A + B \log \left( \frac{e^{(a+bx)}}{c+dx} \right) \right) dx}{31d} - \frac{(b(bc - ad)g^2) \int (ag + bgx) \left( A + B \log \left( \frac{e^{(a+bx)}}{c+dx} \right) \right) dx}{31d^2} \\
&= \frac{Ab(bc - ad)^2 g^3 x}{31d^3} - \frac{(bc - ad)g^3 (a + bx)^2 \left( A + B \log \left( \frac{e^{(a+bx)}}{c+dx} \right) \right)}{62d^2} + \frac{g^3 (a + bx)^3 \left( A + B \log \left( \frac{e^{(a+bx)}}{c+dx} \right) \right)}{62d^2} \\
&= \frac{Ab(bc - ad)^2 g^3 x}{31d^3} + \frac{B(bc - ad)^2 g^3 (a + bx) \log \left( \frac{e^{(a+bx)}}{c+dx} \right)}{31d^3} - \frac{(bc - ad)g^3 (a + bx)^2}{62d^2} + \frac{g^3 (a + bx)^3}{62d^2} \\
&= \frac{Ab(bc - ad)^2 g^3 x}{31d^3} + \frac{B(bc - ad)^2 g^3 (a + bx) \log \left( \frac{e^{(a+bx)}}{c+dx} \right)}{31d^3} - \frac{(bc - ad)g^3 (a + bx)^2}{62d^2} + \frac{g^3 (a + bx)^3}{62d^2} \\
&= \frac{Ab(bc - ad)^2 g^3 x}{31d^3} + \frac{5bB(bc - ad)^2 g^3 x}{186d^3} - \frac{B(bc - ad)g^3 (a + bx)^2}{186d^2} + \frac{B(bc - ad)^2 g^3 (a + bx)^3}{186d^2} \\
&= \frac{Ab(bc - ad)^2 g^3 x}{31d^3} + \frac{5bB(bc - ad)^2 g^3 x}{186d^3} - \frac{B(bc - ad)g^3 (a + bx)^2}{186d^2} + \frac{B(bc - ad)^2 g^3 (a + bx)^3}{186d^2} \\
&= \frac{Ab(bc - ad)^2 g^3 x}{31d^3} + \frac{5bB(bc - ad)^2 g^3 x}{186d^3} - \frac{B(bc - ad)g^3 (a + bx)^2}{186d^2} + \frac{B(bc - ad)^2 g^3 (a + bx)^3}{186d^2} \\
&= \frac{Ab(bc - ad)^2 g^3 x}{31d^3} + \frac{5bB(bc - ad)^2 g^3 x}{186d^3} - \frac{B(bc - ad)g^3 (a + bx)^2}{186d^2} + \frac{B(bc - ad)^2 g^3 (a + bx)^3}{186d^2}
\end{aligned}$$

**Mathematica [A]** time = 0.284686, size = 354, normalized size = 1.4

$$\frac{g^3 \left( 3B(bc - ad)^3 \left( 2 \text{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right) + \log(i(c + dx)) \left( 2 \log \left( \frac{d(a+bx)}{ad-bc} \right) - \log(i(c + dx)) \right) \right) + 2d^3 (a + bx)^3 \left( B \log \left( \frac{e^{(a+bx)}}{c+dx} \right) \right) \right)}{186d^2}$$

Antiderivative was successfully verified.

[In] Integrate[((a\*g + b\*g\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(c\*i + d\*i\*x), x]

[Out] (g^3\*(6\*A\*b\*d\*(b\*c - a\*d)^2\*x + 6\*B\*d\*(b\*c - a\*d)^2\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x)] + 3\*d^2\*(-(b\*c) + a\*d)\*(a + b\*x)^2\*(A + B\*Log[(e\*(a + b\*x))]))/186d^2

$$\begin{aligned} & / (c + d*x)) + 2*d^3*(a + b*x)^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]) - 6*B \\ & *(b*c - a*d)^3*\text{Log}[c + d*x] + B*(b*c - a*d)*(2*b*d*(b*c - a*d)*x - d^2*(a + \\ & b*x)^2 - 2*(b*c - a*d)^2*\text{Log}[c + d*x]) + 3*B*(b*c - a*d)^2*(b*d*x + (-b*c \\ & ) + a*d)*\text{Log}[c + d*x] - 6*(b*c - a*d)^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x \\ & )]*\text{Log}[i*(c + d*x)] + 3*B*(b*c - a*d)^3*((2*\text{Log}[(d*(a + b*x))/(-b*c) + a*d \\ & )] - \text{Log}[i*(c + d*x)])*\text{Log}[i*(c + d*x)] + 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - \\ & a*d)])))/(6*d^4*i) \end{aligned}$$

**Maple [B]** time = 0.187, size = 4297, normalized size = 17.1

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((b*g*x+a*g)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i), x)`

[Out] `-11/6/d*B*g^3/i*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^3-1/d*B*g^3/i*dilog(-d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a^3-1/d*A*g^3/i*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^3+1/d^4*B*g^3/i*dilog(-d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*b^3*c^3-1/d*B*g^3/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a^3+11/6/d^4*B*g^3/i*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*b^3*c^3+1/d^4*A*g^3/i*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*b^3*c^3+3/2*e^2/d*B*g^3/i*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3-3*e/d^4*B*g^3/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*b^4*c^3+1/3*e^3*d^2*B*g^3/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^6/(d*x+c)^3-3*e/d^4*A*g^3/i*b^4/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^3+7/6*e/d*B*g^3/i*b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^3+11/2/d^2*B*g^3/i*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^2*b*c+3*e*B*g^3/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^4/(d*x+c)+3/d^2*B*g^3/i*dilog(-d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a^2*b*c+1/3*e^3/d*A*g^3/i*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^3-3/d^3*B*g^3/i*dilog(-d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*b^2*c^2*a+1/d^4*B*g^3/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*b^3*c^3-11/2/d^3*B*g^3/i*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*b^2*c^2*a+5*e^3/d^2*B*g^3/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*b^4*c^4/(d*x+c)^3*a^2+18*e/d^2*B*g^3/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*b^2*c^2/(d*x+c)*a^2-20/3*e^3/d*B*g^3/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*b^3*c^3/(d*x+c)^3*a^3-12*e/d*B*g^3/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^3/(d*x+c)*b*c-12*e/d^3*B*g^3/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*b^3*c^3/(d*x+c)*a+15*e^2/d^2*B*g^3/i*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)`

$$\begin{aligned}
& c) * b * c)^2 * b^3 * c^3 / (d * x + c)^2 * a^2 - 2 * e^3 * d * B * g^3 / i * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^3 * a^5 / (d * x + c)^3 * b * c - 15 * e^2 / d * B * g^3 / i * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^2 * a^3 / (d * x + c)^2 * b^2 * c^2 - 2 * e^3 / d^3 * B * g^3 / i * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^3 * b^5 * c^5 / (d * x + c)^3 * a - 15 / 2 * e^2 / d^3 * B * g^3 / i * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^2 * b^4 * c^4 / (d * x + c)^2 * a - 3 / 2 * e^2 / d^4 * B * g^3 / i * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^2 * b^5 * c^3 - 9 / 2 * e^2 / d^2 * A * g^3 / i * b^3 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^2 * a^2 * c + 9 / 2 * e^2 / d^3 * A * g^3 / i * b^4 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^2 * c^2 * a - 9 / 2 * e^2 / d^2 * B * g^3 / i * b^3 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^2 * a^2 * c + 9 * e / d^3 * B * g^3 / i * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c) * a * b^3 * c^2 + 3 * e / d^4 * B * g^3 / i * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c) * b^4 * c^4 / (d * x + c) + 1 / 3 * e^3 / d^4 * B * g^3 / i * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^3 * b^6 * c^6 / (d * x + c)^3 + 9 / 2 * e^2 / d^3 * B * g^3 / i * b^4 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^2 * a * c^2 + 3 / 2 * e^2 / d^4 * B * g^3 / i * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^2 * b^5 * c^5 / (d * x + c)^2 - e^3 / d^2 * B * g^3 / i * b^4 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^3 * a^2 * c + e^3 / d^3 * B * g^3 / i * b^5 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^3 * a * c^2 + 15 / 2 * e^2 * B * g^3 / i * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^2 * a^4 / (d * x + c)^2 * b * c + 5 * e^3 * B * g^3 / i * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^3 * a^4 / (d * x + c)^3 * b^2 * c^2 - 9 * e / d^2 * B * g^3 / i * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c) * a^2 * b^2 * c - 3 / 2 * e^2 * d * B * g^3 / i * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^2 * a^5 / (d * x + c)^2 - 1 / 3 * e^3 / d^4 * B * g^3 / i * b^6 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^3 * c^3 + 3 * e / d * B * g^3 / i * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c) * a^3 * b + 3 / d^2 * B * g^3 / i * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) * \ln(-(d * (b * e / d + (a * d - b * c) * e / d / (d * x + c)) - b * e) / b * e) * a^2 * b * c + 1 / 2 * e^2 / d^3 * B * g^3 / i * b^4 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^2 * c^2 * a - 7 / 2 * e / d^2 * B * g^3 / i * b^2 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c) * a^2 * c - 1 / 2 * e^2 / d^2 * B * g^3 / i * b^3 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^2 * a^2 * c + 7 / 2 * e / d^3 * B * g^3 / i * b^3 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c) * c^2 * a - 3 / d^3 * B * g^3 / i * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) * \ln(-(d * (b * e / d + (a * d - b * c) * e / d / (d * x + c)) - b * e) / b * e) * a * b^2 * c^2 + 1 / 3 * e^3 / d * B * g^3 / i * b^3 * \ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^3 * a^3 + e^3 / d^3 * A * g^3 / i * b^5 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^3 * c^2 * a - 9 * e / d^2 * A * g^3 / i * b^2 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c) * a^2 * c + 9 * e / d^3 * A * g^3 / i * b^3 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c) * a * c^2 - e^3 / d^2 * A * g^3 / i * b^4 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^3 * a^2 * c - 7 / 6 * e / d^4 * B * g^3 / i * b^4 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c) * c^3 - 3 / d^3 * A * g^3 / i * \ln(d * (b * e / d + (a * d - b * c) * e / d / (d * x + c)) - b * e) * b^2 * c^2 * a + 3 / d^2 * A * g^3 / i * \ln(d * (b * e / d + (a * d - b * c) * e / d / (d * x + c)) - b * e) * a^2 * b * c - 3 / 2 * e^2 / d^4 * A * g^3 / i * b^5 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^2 * c^3 - 1 / 3 * e^3 / d^4 * A * g^3 / i * b^6 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^3 * c^3 + 3 / 2 * e^2 / d * A * g^3 / i * b^2 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c) * b * c)^2 * a^3 - 1 / 6 * e^2 / d^4 * B * g^3 / i * b^5 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^2 * c^3 + 3 * e / d * A * g^3 / i * b / (d * e / (d * x + c) * a - e / (d * x + c) * b * c) * a^3 + 1 / 6 * e^2 / d * B * g^3 / i * b^2 / (d * e / (d * x + c) * a - e / (d * x + c) * b * c)^2 * a^3
\end{aligned}$$

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**Maxima [B]** time = 1.5426, size = 1067, normalized size = 4.23

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(d\*i\*x+c\*i),x, algorithm="maxima")

[Out] 
$$3*A*a^2*b*g^3*(x/(d*i) - c*\log(d*x + c)/(d^2*i)) - 1/6*A*b^3*g^3*(6*c^3*\log(d*x + c)/(d^4*i) - (2*d^2*x^3 - 3*c*d*x^2 + 6*c^2*x)/(d^3*i)) + 3/2*A*a*b^2*g^3*(2*c^2*\log(d*x + c)/(d^3*i) + (d*x^2 - 2*c*x)/(d^2*i)) + A*a^3*g^3*\log(d*i*x + c*i)/(d*i) - (b^3*c^3*g^3 - 3*a*b^2*c^2*d*g^3 + 3*a^2*b*c*d^2*g^3 - a^3*d^3*g^3)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B/(d^4*i) + 1/6*(6*a^3*d^3*g^3*\log(e) - (6*g^3*\log(e) + 11*g^3)*b^3*c^3 + 9*(2*g^3*\log(e) + 3*g^3)*a*b^2*c^2*d - 18*(g^3*\log(e) + g^3)*a^2*b*c*d^2)*B*\log(d*x + c)/(d^4*i) + 1/6*(2*B*b^3*d^3*g^3*x^3*\log(e) - ((3*g^3*\log(e) + g^3)*b^3*c*d^2 - (9*g^3*\log(e) + g^3)*a*b^2*d^3)*B*x^2 + 3*(b^3*c^3*g^3 - 3*a*b^2*c^2*d*g^3 + 3*a^2*b*c*d^2*g^3 - a^3*d^3*g^3)*B*\log(d*x + c)^2 + ((6*g^3*\log(e) + 5*g^3)*b^3*c^2*d - 6*(3*g^3*\log(e) + 2*g^3)*a*b^2*c*d^2 + (18*g^3*\log(e) + 7*g^3)*a^2*b*d^3)*B*x + (2*B*b^3*d^3*g^3*x^3 - 3*(b^3*c*d^2*g^3 - 3*a*b^2*d^3*g^3)*B*x^2 + 6*(b^3*c^2*d*g^3 - 3*a*b^2*c*d^2*g^3 + 3*a^2*b*d^3*g^3)*B*x + (6*a*b^2*c^2*d*g^3 - 15*a^2*b*c*d^2*g^3 + 11*a^3*d^3*g^3)*B)*\log(b*x + a) - (2*B*b^3*d^3*g^3*x^3 - 3*(b^3*c*d^2*g^3 - 3*a*b^2*d^3*g^3)*B*x^2 + 6*(b^3*c^2*d*g^3 - 3*a*b^2*c*d^2*g^3 + 3*a^2*b*d^3*g^3)*B*x)*\log(d*x + c))/(d^4*i)$$

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**Fricas [F]** time = 0., size = 0, normalized size = 0.

integral  $\left( \frac{Ab^3g^3x^3 + 3Aab^2g^3x^2 + 3Aa^2bg^3x + Aa^3g^3 + (Bb^3g^3x^3 + 3Bab^2g^3x^2 + 3Ba^2bg^3x + Ba^3g^3) \log\left(\frac{bex+ae}{dx+c}\right)}{dix + ci}, x \right)$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(d\*i\*x+c\*i),x, algorithm="fricas")

[Out] integral((A\*b^3\*g^3\*x^3 + 3\*A\*a\*b^2\*g^3\*x^2 + 3\*A\*a^2\*b\*g^3\*x + A\*a^3\*g^3 + (B\*b^3\*g^3\*x^3 + 3\*B\*a\*b^2\*g^3\*x^2 + 3\*B\*a^2\*b\*g^3\*x + B\*a^3\*g^3)\*log((b\*e



```
*x + a*e)/(d*x + c)))/(d*i*x + c*i), x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^3 \left( B \log \left( \frac{(bx+a)e}{dx+c} \right) + A \right)}{dix + ci} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i),x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(B*log((b*x + a)*e/(d*x + c)) + A)/(d*i*x + c*i), x)
```

$$3.32 \quad \int \frac{(ag+bgx)^2 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{ci+dx} dx$$

**Optimal.** Leaf size=198

$$\frac{Bg^2(bc-ad)^2 \text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)}{d^3i} - \frac{g^2(a+bx)(bc-ad) \left( 2B \log\left(\frac{e(a+bx)}{c+dx}\right) + 2A + B \right)}{2d^2i} - \frac{g^2(bc-ad)^2 \log\left(\frac{bc-ad}{b(c+dx)}\right) \left( 2B \log\left(\frac{e(a+bx)}{c+dx}\right) + 2A + B \right)}{2d^3i}$$

[Out]  $(g^2(a+bx)^2(A+B \log[(e(a+bx))/(c+dx)]))/(2di) - ((b^2c - a^2d)g^2(a+bx)(2A+B+2B \log[(e(a+bx))/(c+dx)]))/(2d^2i) - ((b^2c - a^2d)^2g^2 \log[(b^2c - a^2d)/(b(c+dx))](2A+3B+2B \log[(e(a+bx))/(c+dx)]))/(2d^3i) - (B(b^2c - a^2d)^2g^2 \text{PolyLog}[2, (d(a+bx))/(b(c+dx))])/(d^3i)$

**Rubi [A]** time = 0.487327, antiderivative size = 329, normalized size of antiderivative = 1.66, number of steps used = 19, number of rules used = 13, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.325$ , Rules used = {2528, 2486, 31, 2525, 12, 43, 2524, 2418, 2394, 2393, 2391, 2301}

$$\frac{Bg^2(bc-ad)^2 \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{d^3i} + \frac{g^2(bc-ad)^2 \log(ci+dx) \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{d^3i} + \frac{g^2(a+bx)^2 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{2di}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[(a+bx)^2(A+B \log[(e(a+bx))/(c+dx)])/(c+dx), x]$

[Out]  $-((A*b*(b^2c - a^2d)g^2x)/(d^2i)) - (b^2B*(b^2c - a^2d)g^2x)/(2d^2i) - (B*(b^2c - a^2d)g^2(a+bx) \log[(e(a+bx))/(c+dx)]/(d^2i) + (g^2(a+bx)^2(A+B \log[(e(a+bx))/(c+dx)]))/(2di) + (3*B*(b^2c - a^2d)^2g^2 \log[c+dx])/(2d^3i) + (B*(b^2c - a^2d)^2g^2 \log[(c+dx)^2])/(2d^3i) - (B*(b^2c - a^2d)^2g^2 \log[-((d(a+bx))/(b^2c - a^2d))] \log[c+dx])/(d^3i) + ((b^2c - a^2d)^2g^2(A+B \log[(e(a+bx))/(c+dx)]) \log[c+dx])/(d^3i) - (B*(b^2c - a^2d)^2g^2 \text{PolyLog}[2, (b(c+dx))/(b^2c - a^2d)])/(d^3i)$

**Rule 2528**

$\text{Int}[(a+bx)^2(A+B \log[(e(a+bx))/(c+dx)])/(c+dx), x] \text{ := With } \{u = \text{ExpandIntegrand}[(a+bx \log[c+dx])^n, RGx, x], \text{Int}[u, x] \text{ ; SumQ}[u] \text{ ; FreeQ}\{a, b, c, p\}, x \text{ \&\& RationalFunctionQ}[RGx, x] \text{ \&\& RationalFunctionQ}[RGx, x] \text{ \&\& IGtQ}[n, 0]$

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q]^r]^s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_.) + (b_.)*(x_))^(n_.), x_Symbol] := Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_.)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_.)*(v_)] /; FreeQ[b, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
```

```
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFX, x] && IntegerQ[p]
```

#### Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x
), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

#### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

#### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

#### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

#### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_))^(n_.)]*(b_.)/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

#### Rubi steps

$$\begin{aligned}
\int \frac{(ag + bgx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{32c + 32dx} dx &= \int \left( -\frac{b(bc - ad)g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{32d^2} + \frac{(bc - ad)^2 g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{d^2(32c + 32dx)} \right) dx \\
&= \frac{(bg) \int (ag + bgx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) dx}{32d} - \frac{(b(bc - ad)g^2) \int \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) dx}{32d^2} \\
&= -\frac{Ab(bc - ad)g^2 x}{32d^2} + \frac{g^2(a + bx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{64d} + \frac{(bc - ad)^2 g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{32d^2} \\
&= -\frac{Ab(bc - ad)g^2 x}{32d^2} - \frac{B(bc - ad)g^2(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{32d^2} + \frac{g^2(a + bx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{64d} \\
&= -\frac{Ab(bc - ad)g^2 x}{32d^2} - \frac{B(bc - ad)g^2(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{32d^2} + \frac{g^2(a + bx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{64d} \\
&= -\frac{Ab(bc - ad)g^2 x}{32d^2} - \frac{bB(bc - ad)g^2 x}{64d^2} - \frac{B(bc - ad)g^2(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{32d^2} + \frac{g^2(a + bx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{64d} \\
&= -\frac{Ab(bc - ad)g^2 x}{32d^2} - \frac{bB(bc - ad)g^2 x}{64d^2} - \frac{B(bc - ad)g^2(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{32d^2} + \frac{g^2(a + bx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{64d} \\
&= -\frac{Ab(bc - ad)g^2 x}{32d^2} - \frac{bB(bc - ad)g^2 x}{64d^2} - \frac{B(bc - ad)g^2(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{32d^2} + \frac{g^2(a + bx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{64d} \\
&= -\frac{Ab(bc - ad)g^2 x}{32d^2} - \frac{bB(bc - ad)g^2 x}{64d^2} - \frac{B(bc - ad)g^2(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{32d^2} + \frac{g^2(a + bx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{64d}
\end{aligned}$$

**Mathematica [A]** time = 0.170747, size = 254, normalized size = 1.28

$$\frac{g^2 \left( -B(bc - ad)^2 \left( 2 \text{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right) + \log(i(c + dx)) \left( 2 \log \left( \frac{d(a+bx)}{ad-bc} \right) - \log(i(c + dx)) \right) \right) + d^2(a + bx)^2 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) \right)}{32d^2}$$

Antiderivative was successfully verified.

[In] Integrate[((a\*g + b\*g\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]]))/(c\*i + d\*i\*x), x]

[Out] (g^2\*(-2\*A\*b\*d\*(b\*c - a\*d)\*x + 2\*B\*d\*(-(b\*c) + a\*d)\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x)] + d^2\*(a + b\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])) + 2\*

$$B*(b*c - a*d)^2*\text{Log}[c + d*x] - B*(b*c - a*d)*(b*d*x + (-(b*c) + a*d)*\text{Log}[c + d*x]) + 2*(b*c - a*d)^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])*\text{Log}[i*(c + d*x)] - B*(b*c - a*d)^2*((2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] - \text{Log}[i*(c + d*x)])*\text{Log}[i*(c + d*x)] + 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])))/(2*d^3*i)$$

**Maple [B]** time = 0.189, size = 2309, normalized size = 11.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In]  $\text{int}((b*g*x+a*g)^2*(A+B*\ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i), x)$

[Out] 
$$\begin{aligned} & -1/d*B*g^2/i*\text{dilog}(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a^2-1/d*A*g^2/i*\ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^2-3/2/d*B*g^2/i*\ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^2-3*e^2/d*B*g^2/i*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2/(d*x+c)^2*b^2*c^2+6*e/d^2*B*g^2/i*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a/(d*x+c)*b^2*c^2+2*e^2/d^2*B*g^2/i*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a/(d*x+c)^2*b^3*c^3-6*e/d*B*g^2/i*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2/(d*x+c)*b*c-3/2/d^3*B*g^2/i*\ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*b^2*c^2-e^2/d^2*A*g^2/i*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c*a-e/d^2*B*g^2/i*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a*c-4*e/d^2*A*g^2/i*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a*c+1/2*e^2/d^3*B*g^2/i*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*b^4*c^2+2*e/d*B*g^2/i*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2*b+2*e/d^3*B*g^2/i*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*b^3*c^2+2/d^2*B*g^2/i*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*\ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a*b*c+1/2*e^2/d*B*g^2/i*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2*b^2-1/2*e^2*d*B*g^2/i*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a^2-1/d^3*B*g^2/i*\text{dilog}(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*b^2*c^2+2/d^2*B*g^2/i*\text{dilog}(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a*b*c+2/d^2*A*g^2/i*\ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a*b*c-1/d^3*B*g^2/i*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*\ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*b^2*c^2+2*e/d*A*g^2/i*b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2+1/2*e/d^3*B*g^2/i*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^2+1/2*e^2/d*A*g^2/i*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2+1/2*e^2/d^3*A*g^2/i*b^4/(d*e/(d*x+c)) \end{aligned}$$

$$\begin{aligned} & *a-e/(d*x+c)*b*c)^2*c^2+1/2*e/d*B*g^2/i*b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2 \\ & +2*e/d^3*A*g^2/i*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^2+2*e*B*g^2/i*\ln(b*e/d \\ & +(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^3/(d*x+c)+3/d^2*B*g \\ & ^2/i*\ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a*b*c-4*e/d^2*B*g^2/i*\ln(b*e/d \\ & +(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a*b^2*c-2*e/d^3*B*g^2 \\ & /i*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*b^3*c^3/(d \\ & *x+c)-e^2/d^2*B*g^2/i*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x \\ & +c)*b*c)^2*b^3*c*a-1/2*e^2/d^3*B*g^2/i*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e \\ & /(d*x+c)*a-e/(d*x+c)*b*c)^2*b^4*c^4/(d*x+c)^2 \end{aligned}$$

**Maxima [B]** time = 1.45319, size = 644, normalized size = 3.25

$$2 Aabg^2 \left( \frac{x}{di} - \frac{c \log(dx+c)}{d^2i} \right) + \frac{1}{2} Ab^2g^2 \left( \frac{2c^2 \log(dx+c)}{d^3i} + \frac{dx^2 - 2cx}{d^2i} \right) + \frac{Aa^2g^2 \log(dix+ci)}{di} + \frac{(b^2c^2g^2 - 2abcdg^2 + \dots)}{\dots}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(d\*i\*x+c\*i),x, algorithm="maxima")

[Out]  $2*A*a*b*g^2*(x/(d*i) - c*\log(d*x + c)/(d^2*i)) + 1/2*A*b^2*g^2*(2*c^2*\log(d*x + c)/(d^3*i) + (d*x^2 - 2*c*x)/(d^2*i)) + A*a^2*g^2*\log(d*i*x + c*i)/(d*i) + (b^2*c^2*g^2 - 2*a*b*c*d*g^2 + a^2*d^2*g^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B/(d^3*i) + 1/2*(2*a^2*d^2*g^2*\log(e) + (2*g^2*\log(e) + 3*g^2)*b^2*c^2 - 4*(g^2*\log(e) + g^2)*a*b*c*d)*B*\log(d*x + c)/(d^3*i) + 1/2*(B*b^2*d^2*g^2*x^2*\log(e) - (b^2*c^2*g^2 - 2*a*b*c*d*g^2 + a^2*d^2*g^2)*B*\log(d*x + c)^2 - ((2*g^2*\log(e) + g^2)*b^2*c*d - (4*g^2*\log(e) + g^2)*a*b*d^2)*B*x + (B*b^2*d^2*g^2*x^2 - 2*(b^2*c*d*g^2 - 2*a*b*d^2*g^2)*B*x - (2*a*b*c*d*g^2 - 3*a^2*d^2*g^2)*B)*\log(b*x + a) - (B*b^2*d^2*g^2*x^2 - 2*(b^2*c*d*g^2 - 2*a*b*d^2*g^2)*B*x)*\log(d*x + c))/(d^3*i)$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{Ab^2g^2x^2 + 2Aabg^2x + Aa^2g^2 + (Bb^2g^2x^2 + 2Babg^2x + Ba^2g^2) \log\left(\frac{bex+ae}{dx+c}\right)}{dix+ci}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i),x, algorithm="fricas")
```

```
[Out] integral((A*b^2*g^2*x^2 + 2*A*a*b*g^2*x + A*a^2*g^2 + (B*b^2*g^2*x^2 + 2*B*a*b*g^2*x + B*a^2*g^2)*log((b*e*x + a*e)/(d*x + c)))/(d*i*x + c*i), x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^2 \left( B \log\left(\frac{(bx+a)e}{dx+c}\right) + A \right)}{dix + ci} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i),x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(B*log((b*x + a)*e/(d*x + c)) + A)/(d*i*x + c*i), x)
```



$$3.33 \quad \int \frac{(ag+bgx)\left(A+B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{ci+dix} dx$$

**Optimal.** Leaf size=125

$$\frac{Bg(bc-ad)\text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)}{d^2i} + \frac{g(bc-ad) \log\left(\frac{bc-ad}{b(c+dx)}\right) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A + B\right)}{d^2i} + \frac{g(a+bx) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{di}$$

[Out] (g\*(a + b\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]]))/(d\*i) + ((b\*c - a\*d)\*g\*Log[(b\*c - a\*d)/(b\*(c + d\*x))]\*(A + B + B\*Log[(e\*(a + b\*x))/(c + d\*x]]))/(d^2\*i) + (B\*(b\*c - a\*d)\*g\*PolyLog[2, (d\*(a + b\*x))/(b\*(c + d\*x))])/(d^2\*i)

**Rubi [A]** time = 0.354912, antiderivative size = 213, normalized size of antiderivative = 1.7, number of steps used = 14, number of rules used = 11, integrand size = 38,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.29$ , Rules used = {2528, 2486, 31, 2524, 12, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{Bg(bc-ad)\text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{d^2i} - \frac{g(bc-ad) \log(c+dx) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{d^2i} - \frac{Bg(bc-ad) \log^2(c+dx)}{2d^2i} + \frac{Bg(bc-a$$

Antiderivative was successfully verified.

[In] Int[((a\*g + b\*g\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]]))/(c\*i + d\*i\*x),x]

[Out] (A\*b\*g\*x)/(d\*i) + (B\*g\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x]])/(d\*i) - (B\*(b\*c - a\*d)\*g\*Log[c + d\*x])/(d^2\*i) + (B\*(b\*c - a\*d)\*g\*Log[-((d\*(a + b\*x))/(b\*c - a\*d))]\*Log[c + d\*x])/(d^2\*i) - ((b\*c - a\*d)\*g\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]])\*Log[c + d\*x])/(d^2\*i) - (B\*(b\*c - a\*d)\*g\*Log[c + d\*x]^2)/(2\*d^2\*i) + (B\*(b\*c - a\*d)\*g\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)]/(d^2\*i)

### Rule 2528

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*(RGx\_), x\_Symbol] :> With[{u = ExpandIntegrand[(a + b\*Log[c\*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

### Rule 2486

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.), x\_Symbol] :> Simp[((a + b\*x)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/b, x] + Dist[(q\*r\*s\*(b\*c - a\*d))/b, Int[Log[e\*(f\*(a + b\*x)^p\*(c +

$d*x)^q)^r)^{(s-1)/(c+d*x), x], x] /; \text{FreeQ}\{a, b, c, d, e, f, p, q, r, s\}, x] \&\& \text{NeQ}[b*c - a*d, 0] \&\& \text{EqQ}[p + q, 0] \&\& \text{IGtQ}[s, 0]$

### Rule 31

$\text{Int}[(a_) + (b_)*(x_))^{-1}, x\_Symbol] \rightarrow \text{Simp}[\text{Log}[\text{RemoveContent}[a + b*x, x]]/b, x] /; \text{FreeQ}\{a, b\}, x]$

### Rule 2524

$\text{Int}[(a_) + \text{Log}[(c_)*(Rfx_)^{(p_)}]*(b_))^{(n_)} / ((d_) + (e_)*(x_)), x\_Symbol] \rightarrow \text{Simp}[(\text{Log}[d + e*x]*(a + b*\text{Log}[c*Rfx^p])^n)/e, x] - \text{Dist}[(b*n*p)/e, \text{Int}[(\text{Log}[d + e*x]*(a + b*\text{Log}[c*Rfx^p])^{(n-1)}*D[Rfx, x])/Rfx, x], x] /; \text{FreeQ}\{a, b, c, d, e, p\}, x] \&\& \text{RationalFunctionQ}[Rfx, x] \&\& \text{IGtQ}[n, 0]$

### Rule 12

$\text{Int}[(a_)*(u_), x\_Symbol] \rightarrow \text{Dist}[a, \text{Int}[u, x], x] /; \text{FreeQ}[a, x] \&\& \text{!MatchQ}[u, (b_)*(v_)] /; \text{FreeQ}[b, x]$

### Rule 2418

$\text{Int}[(a_) + \text{Log}[(c_)*((d_) + (e_)*(x_))^{(n_)}]*(b_))^{(p_)}*(Rfx_), x\_Symbol] \rightarrow \text{With}\{u = \text{ExpandIntegrand}[(a + b*\text{Log}[c*(d + e*x)^n])^p, Rfx, x]\}, \text{Int}[u, x] /; \text{SumQ}[u] /; \text{FreeQ}\{a, b, c, d, e, n\}, x] \&\& \text{RationalFunctionQ}[Rfx, x] \&\& \text{IntegerQ}[p]$

### Rule 2394

$\text{Int}[(a_) + \text{Log}[(c_)*((d_) + (e_)*(x_))^{(n_)}]*(b_)) / ((f_) + (g_)*(x_)), x\_Symbol] \rightarrow \text{Simp}[(\text{Log}[(e*(f + g*x))/(e*f - d*g)]*(a + b*\text{Log}[c*(d + e*x)^n]))/g, x] - \text{Dist}[(b*e*n)/g, \text{Int}[\text{Log}[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, n\}, x] \&\& \text{NeQ}[e*f - d*g, 0]$

### Rule 2393

$\text{Int}[(a_) + \text{Log}[(c_)*((d_) + (e_)*(x_))]*(b_)) / ((f_) + (g_)*(x_)), x\_Symbol] \rightarrow \text{Dist}[1/g, \text{Subst}[\text{Int}[(a + b*\text{Log}[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g\}, x] \&\& \text{NeQ}[e*f - d*g, 0] \&\& \text{EqQ}[g + c*(e*f - d*g), 0]$

### Rule 2391

$\text{Int}[\text{Log}[(c_)*((d_) + (e_)*(x_))^{(n_)}]]/(x_), x\_Symbol] \rightarrow -\text{Simp}[\text{PolyLog}[2, -(c*e*x^n)]/n, x] /; \text{FreeQ}\{c, d, e, n\}, x] \&\& \text{EqQ}[c*d, 1]$

Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_.) + (e\_.)\*(x\_.))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_.) + (g\_.)\*(x\_.))^(q\_.), x\_Symbol] := Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && Eqq[e\*f - d\*g, 0]

Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_.)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] := Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

Rubi steps

$$\begin{aligned}
 \int \frac{(ag + bgx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{33c + 33dx} dx &= \int \left( \frac{bg \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{33d} + \frac{(-bc + ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{33d(c + dx)} \right) dx \\
 &= \frac{(bg) \int \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) dx}{33d} - \frac{((bc - ad)g) \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{c+dx} dx}{33d} \\
 &= \frac{Abgx}{33d} - \frac{(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) \log(c + dx)}{33d^2} + \frac{(bBg) \int \log \left( \frac{e(a+bx)}{c+dx} \right) dx}{33d} \\
 &= \frac{Abgx}{33d} + \frac{Bg(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{33d} - \frac{(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) \log(c + dx)}{33d^2} \\
 &= \frac{Abgx}{33d} + \frac{Bg(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{33d} - \frac{B(bc - ad)g \log(c + dx)}{33d^2} - \frac{(bc - ad)g \left( A + \right)}{33d^2} \\
 &= \frac{Abgx}{33d} + \frac{Bg(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{33d} - \frac{B(bc - ad)g \log(c + dx)}{33d^2} - \frac{(bc - ad)g \left( A + \right)}{33d^2} \\
 &= \frac{Abgx}{33d} + \frac{Bg(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{33d} - \frac{B(bc - ad)g \log(c + dx)}{33d^2} + \frac{B(bc - ad)g \log}{33d^2} \\
 &= \frac{Abgx}{33d} + \frac{Bg(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{33d} - \frac{B(bc - ad)g \log(c + dx)}{33d^2} + \frac{B(bc - ad)g \log}{33d^2} \\
 &= \frac{Abgx}{33d} + \frac{Bg(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{33d} - \frac{B(bc - ad)g \log(c + dx)}{33d^2} + \frac{B(bc - ad)g \log}{33d^2}
 \end{aligned}$$

**Mathematica [A]** time = 0.107321, size = 162, normalized size = 1.3

$$\frac{g \left( B(bc - ad) \left( 2 \operatorname{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right) + \log(c + dx) \left( 2 \log \left( \frac{d(a+bx)}{ad-bc} \right) - \log(c + dx) \right) \right) - 2(bc - ad) \log(c + dx) \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{2d^2i}$$

Antiderivative was successfully verified.

[In] Integrate[((a\*g + b\*g\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])))/(c\*i + d\*i\*x), x]

[Out] (g\*(2\*A\*b\*d\*x + 2\*B\*d\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x)] - 2\*B\*(b\*c - a\*d)\*Log[c + d\*x] - 2\*(b\*c - a\*d)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]\*Log[c + d\*x] + B\*(b\*c - a\*d)\*((2\*Log[(d\*(a + b\*x))/(-b\*c + a\*d)] - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])))/(2\*d^2\*i)

**Maple [B]** time = 0.158, size = 895, normalized size = 7.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))/(d\*i\*x+c\*i), x)

[Out] 
$$\begin{aligned} & -1/d*g/i*A*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a+1/d^2*g/i*A*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*b*c+e/d*g/i*A*b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c) \\ & *a-e/d^2*g/i*A*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c-1/d*g/i*B*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a+1/d^2*g/i*B*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*b*c-1/d*g/i*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a+1/d^2*g/i*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*b*c-1/d*g/i*B*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a+1/d^2*g/i*B*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*b*c+e/d*g/i*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*b*a-e/d^2*g/i*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*b^2*c+e*g/i*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)/(d*x+c)*a^2-2*e/d*g/i*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)/(d*x+c)*a*b*c+e/d^2*g/i*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)/(d*x+c)*b^2*c^2 \end{aligned}$$

**Maxima [A]** time = 1.49421, size = 298, normalized size = 2.38

$$Abg\left(\frac{x}{di} - \frac{c \log(dx + c)}{d^2i}\right) + \frac{Aag \log(dix + ci)}{di} - \frac{(bcg - adg)\left(\log(bx + a) \log\left(\frac{bdx+ad}{bc-ad} + 1\right) + \text{Li}_2\left(-\frac{bdx+ad}{bc-ad}\right)\right)B}{d^2i} + \frac{(adg \log(bx + a) \log\left(\frac{bdx+ad}{bc-ad} + 1\right) + \text{Li}_2\left(-\frac{bdx+ad}{bc-ad}\right))B}{d^2i}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(d\*i\*x+c\*i),x, algorithm="maxima")

[Out] A\*b\*g\*(x/(d\*i) - c\*log(d\*x + c)/(d^2\*i)) + A\*a\*g\*log(d\*i\*x + c\*i)/(d\*i) - (b\*c\*g - a\*d\*g)\*(log(b\*x + a)\*log((b\*d\*x + a\*d)/(b\*c - a\*d) + 1) + dilog(-(b\*d\*x + a\*d)/(b\*c - a\*d)))\*B/(d^2\*i) + (a\*d\*g\*log(e) - (g\*log(e) + g)\*b\*c)\*B\*log(d\*x + c)/(d^2\*i) - 1/2\*(2\*B\*b\*d\*g\*x\*log(d\*x + c) - 2\*B\*b\*d\*g\*x\*log(e) - (b\*c\*g - a\*d\*g)\*B\*log(d\*x + c)^2 - 2\*(B\*b\*d\*g\*x + B\*a\*d\*g)\*log(b\*x + a))/d^2\*i)

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Abgx + Aag + (Bbgx + Bag) \log\left(\frac{bex+ae}{dx+c}\right)}{dix + ci}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(d\*i\*x+c\*i),x, algorithm="fricas")

[Out] integral((A\*b\*g\*x + A\*a\*g + (B\*b\*g\*x + B\*a\*g)\*log((b\*e\*x + a\*e)/(d\*x + c)))/(d\*i\*x + c\*i), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))/(d\*i\*x+c\*i),x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag) \left( B \log \left( \frac{(bx+a)e}{dx+c} \right) + A \right)}{dix + ci} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(d\*i\*x+c\*i),x, algorithm="giac")

[Out] integrate((b\*g\*x + a\*g)\*(B\*log((b\*x + a)\*e/(d\*x + c)) + A)/(d\*i\*x + c\*i), x )

$$3.34 \quad \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{ci+dix} dx$$

**Optimal.** Leaf size=76

$$-\frac{BPolyLog\left(2, \frac{d(a+bx)}{b(c+dx)}\right)}{di} - \frac{\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{di}$$

[Out] -((Log[(b\*c - a\*d)/(b\*(c + d\*x))]\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])))/(d\*i) - (B\*PolyLog[2, (d\*(a + b\*x))/(b\*(c + d\*x))])/(d\*i)

**Rubi [A]** time = 0.215483, antiderivative size = 122, normalized size of antiderivative = 1.61, number of steps used = 10, number of rules used = 8, integrand size = 30,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$ , Rules used = {2524, 12, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{BPolyLog\left(2, \frac{b(c+dx)}{bc-ad}\right)}{di} + \frac{\log(ci + dix)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{di} - \frac{B \log(ci + dix) \log\left(-\frac{d(a+bx)}{bc-ad}\right)}{di} + \frac{B \log^2(i(c + dx))}{2di}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])]/(c\*i + d\*i\*x), x]

[Out] (B\*Log[i\*(c + d\*x)]^2)/(2\*d\*i) - (B\*Log[-((d\*(a + b\*x))/(b\*c - a\*d))]\*Log[c\*i + d\*i\*x])/(d\*i) + ((A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]\*Log[c\*i + d\*i\*x])/(d\*i) - (B\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])/(d\*i)

### Rule 2524

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)/((d\_.) + (e\_.)\*(x\_.)), x\_Symbol] :> Simp[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^n)/e, x] - Dist[(b^n\*p)/e, Int[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

### Rule 12

Int[(a\_)\*(u\_), x\_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b\_)\*(v\_) /; FreeQ[b, x]]

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

### Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)
]^n))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)]^(n_.)]*(b_.)/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rubi steps



$$\begin{aligned}
\int \frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{34c + 34dx} dx &= \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right) \log(34c + 34dx)}{34d} - \frac{B \int \frac{(c+dx)\left(-\frac{de(a+bx)}{(c+dx)^2} + \frac{be}{c+dx}\right) \log(34c+34dx)}{e(a+bx)} dx}{34d} \\
&= \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right) \log(34c + 34dx)}{34d} - \frac{B \int \frac{(c+dx)\left(-\frac{de(a+bx)}{(c+dx)^2} + \frac{be}{c+dx}\right) \log(34c+34dx)}{a+bx} dx}{34de} \\
&= \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right) \log(34c + 34dx)}{34d} - \frac{B \int \left(\frac{be \log(34c+34dx)}{a+bx} - \frac{de \log(34c+34dx)}{c+dx}\right) dx}{34de} \\
&= \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right) \log(34c + 34dx)}{34d} + \frac{1}{34} B \int \frac{\log(34c + 34dx)}{c + dx} dx - \frac{(bB) \int \frac{\log(34c+34dx)}{a+bx} dx}{34d} \\
&= -\frac{B \log\left(-\frac{d(a+bx)}{bc-ad}\right) \log(34c + 34dx)}{34d} + \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right) \log(34c + 34dx)}{34d} + B \int \frac{\log\left(\frac{34c+34dx}{-34}\right)}{34c + 34dx} dx \\
&= -\frac{B \log\left(-\frac{d(a+bx)}{bc-ad}\right) \log(34c + 34dx)}{34d} + \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right) \log(34c + 34dx)}{34d} + \frac{B \text{Subst}\left(\int \frac{\log(x)}{x} dx, \frac{34c+34dx}{-34}\right)}{34d} \\
&= \frac{B \log^2(34(c + dx))}{68d} - \frac{B \log\left(-\frac{d(a+bx)}{bc-ad}\right) \log(34c + 34dx)}{34d} + \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right) \log(34c + 34dx)}{34d}
\end{aligned}$$

**Mathematica [A]** time = 0.0317992, size = 95, normalized size = 1.25

$$\frac{\log(i(c + dx)) \left( 2B \log\left(\frac{e(a+bx)}{c+dx}\right) - 2B \log\left(\frac{d(a+bx)}{ad-bc}\right) + 2A + B \log(i(c + dx)) \right) - 2B \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{2di}$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])/(c\*i + d\*i\*x), x]

[Out] (Log[i\*(c + d\*x)]\*(2\*A - 2\*B\*Log[(d\*(a + b\*x))/(-b\*c) + a\*d]) + 2\*B\*Log[(e\*(a + b\*x))/(c + d\*x)] + B\*Log[i\*(c + d\*x)]) - 2\*B\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)]/(2\*d\*i)

**Maple [B]** time = 0.056, size = 411, normalized size = 5.4

$$-\frac{Aa}{i(ad-bc)} \ln\left(d\left(\frac{be}{d} + \frac{e(ad-bc)}{(dx+c)d}\right) - be\right) + \frac{Abc}{di(ad-bc)} \ln\left(d\left(\frac{be}{d} + \frac{e(ad-bc)}{(dx+c)d}\right) - be\right) - \frac{Ba}{i(ad-bc)} \text{dilog}\left(-\frac{1}{be} \left(d\left(\frac{be}{d} + \frac{e(ad-bc)}{(dx+c)d}\right) - be\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i),x)`

[Out]  $-1/i/(a*d-b*c)*A*\ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a+1/d/i/(a*d-b*c)*A*\ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*b*c-1/i/(a*d-b*c)*B*\operatorname{dilog}(-d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a+1/d/i/(a*d-b*c)*B*\operatorname{dilog}(-d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*b*c-1/i/(a*d-b*c)*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*\ln(-d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a+1/d/i/(a*d-b*c)*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*\ln(-d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*b*c$

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2}B\left(\frac{\log(dx+c)^2}{di}-2\int\frac{\log(bx+a)+\log(e)}{dix+ci}dx\right)+\frac{A\log(dix+ci)}{di}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i),x, algorithm="maxima")`

[Out]  $-1/2*B*(\log(d*x + c)^2/(d*i) - 2*\operatorname{integrate}((\log(b*x + a) + \log(e))/(d*i*x + c*i), x)) + A*\log(d*i*x + c*i)/(d*i)$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{B\log\left(\frac{bex+ae}{dx+c}\right)+A}{dix+ci},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i),x, algorithm="fricas")`

[Out]  $\operatorname{integral}((B*\log((b*e*x + a*e)/(d*x + c)) + A)/(d*i*x + c*i), x)$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*(b\*x+a)/(d\*x+c)))/(d\*i\*x+c\*i),x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{B \log\left(\frac{(bx+a)e}{dx+c}\right) + A}{dix + ci} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(d\*i\*x+c\*i),x, algorithm="giac")

[Out] integrate((B\*log((b\*x + a)\*e/(d\*x + c)) + A)/(d\*i\*x + c\*i), x)

$$3.35 \quad \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)(ci+dix)} dx$$

**Optimal.** Leaf size=44

$$\frac{\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)^2}{2Bgi(bc-ad)}$$

[Out] (A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2/(2\*B\*(b\*c - a\*d)\*g\*i)

**Rubi [C]** time = 0.584468, antiderivative size = 304, normalized size of antiderivative = 6.91, number of steps used = 20, number of rules used = 9, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.225$ , Rules used = {2528, 2524, 12, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{BPolyLog\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{gi(bc-ad)} + \frac{BPolyLog\left(2, \frac{b(c+dx)}{bc-ad}\right)}{gi(bc-ad)} + \frac{\log(a+bx)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{gi(bc-ad)} - \frac{\log(c+dx)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{gi(bc-ad)}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])/(a\*g + b\*g\*x\*(c\*i + d\*i\*x)),x]

[Out] -(B\*Log[a + b\*x]^2)/(2\*(b\*c - a\*d)\*g\*i) + (Log[a + b\*x]\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/((b\*c - a\*d)\*g\*i) + (B\*Log[-((d\*(a + b\*x))/(b\*c - a\*d))]\*Log[c + d\*x])/((b\*c - a\*d)\*g\*i) - ((A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])\*Log[c + d\*x])/((b\*c - a\*d)\*g\*i) - (B\*Log[c + d\*x]^2)/(2\*(b\*c - a\*d)\*g\*i) + (B\*Log[a + b\*x]\*Log[(b\*(c + d\*x))/(b\*c - a\*d)])/((b\*c - a\*d)\*g\*i) + (B\*PolyLog[2, -((d\*(a + b\*x))/(b\*c - a\*d))])/((b\*c - a\*d)\*g\*i) + (B\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])/((b\*c - a\*d)\*g\*i)

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[ {u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]
] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
```

, Int[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x] /;  
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

### Rule 12

Int[(a\_)\*(u\_), x\_Symbol] :=> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match  
Q[u, (b\_)\*(v\_)] /; FreeQ[b, x]

### Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*(RFx\_), x\_Sy  
mbol] :=> With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n])^p, RFx, x]},  
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[  
RFx, x] && IntegerQ[p]

### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.  
)\*(x\_))^(q\_.), x\_Symbol] :=> Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^  
n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E  
qQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] :=> Simp[(a + b\*Lo  
g[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_  
)), x\_Symbol] :=> Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x  
)^n]))/g, x] - Dist[(b\*e^n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x)  
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))])\*(b\_.)/((f\_.) + (g\_.)\*(x\_)), x\_  
Symbol] :=> Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x  
, x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*  
(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] :=> -Simp[PolyLog[2  
, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

Rubi steps

$$\begin{aligned}
\int \frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(35c + 35dx)(ag + bgx)} dx &= \int \left( \frac{b \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{35(bc - ad)g(a + bx)} - \frac{d \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{35(bc - ad)g(c + dx)} \right) dx \\
&= \frac{b \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx} dx}{35(bc - ad)g} - \frac{d \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx} dx}{35(bc - ad)g} \\
&= \frac{\log(a + bx) \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{35(bc - ad)g} - \frac{\left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right) \log(c + dx)}{35(bc - ad)g} - \frac{B \int \frac{(c+dx) \left( -\frac{de(a+bx)}{(c+dx)} \right)}{e}}{35(bc - ad)g} \\
&= \frac{\log(a + bx) \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{35(bc - ad)g} - \frac{\left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right) \log(c + dx)}{35(bc - ad)g} - \frac{B \int \frac{(c+dx) \left( -\frac{de(a+bx)}{(c+dx)} \right)}{e}}{35(bc - ad)g} \\
&= \frac{\log(a + bx) \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{35(bc - ad)g} - \frac{\left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right) \log(c + dx)}{35(bc - ad)g} - \frac{B \int \left( \frac{be \log(a+bx)}{a+bx} \right)}{35(bc - ad)g} \\
&= \frac{\log(a + bx) \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{35(bc - ad)g} - \frac{\left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right) \log(c + dx)}{35(bc - ad)g} - \frac{(bB) \int \frac{\log(a+bx)}{a+bx}}{35(bc - ad)g} \\
&= \frac{\log(a + bx) \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{35(bc - ad)g} + \frac{B \log\left(-\frac{d(a+bx)}{bc-ad}\right) \log(c + dx)}{35(bc - ad)g} - \frac{\left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{35(bc - ad)g} \\
&= -\frac{B \log^2(a + bx)}{70(bc - ad)g} + \frac{\log(a + bx) \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{35(bc - ad)g} + \frac{B \log\left(-\frac{d(a+bx)}{bc-ad}\right) \log(c + dx)}{35(bc - ad)g} - \frac{\left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{35(bc - ad)g} \\
&= -\frac{B \log^2(a + bx)}{70(bc - ad)g} + \frac{\log(a + bx) \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{35(bc - ad)g} + \frac{B \log\left(-\frac{d(a+bx)}{bc-ad}\right) \log(c + dx)}{35(bc - ad)g} - \frac{\left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{35(bc - ad)g}
\end{aligned}$$

**Mathematica [C]** time = 0.114315, size = 207, normalized size = 4.7

$$\frac{2BPolyLog\left(2, \frac{d(a+bx)}{ad-bc}\right) + 2BPolyLog\left(2, \frac{b(c+dx)}{bc-ad}\right) + 2A \log(a + bx) + 2B \log(a + bx) \log\left(\frac{e(a+bx)}{c+dx}\right) - 2B \log(c + dx) \log\left(\frac{e(a+bx)}{c+dx}\right)}{2gi(bc - ad)}$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))/((a\*g + b\*g\*x)\*(c\*i + d\*i\*x))

),x]

[Out]  $(2*A*\text{Log}[a + b*x] - B*\text{Log}[a + b*x]^2 + 2*B*\text{Log}[a + b*x]*\text{Log}[(e*(a + b*x))/(c + d*x)] - 2*A*\text{Log}[c + d*x] + 2*B*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)]*\text{Log}[c + d*x] - 2*B*\text{Log}[(e*(a + b*x))/(c + d*x)]*\text{Log}[c + d*x] - B*\text{Log}[c + d*x]^2 + 2*B*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)] + 2*B*\text{PolyLog}[2, (d*(a + b*x))/(-(b*c) + a*d)] + 2*B*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])/(2*(b*c - a*d)*g*i)$

**Maple [B]** time = 0.052, size = 201, normalized size = 4.6

$$-\frac{Aad}{i(ad-bc)^2g} \ln\left(\frac{be}{d} + \frac{e(ad-bc)}{(dx+c)d}\right) + \frac{Abc}{i(ad-bc)^2g} \ln\left(\frac{be}{d} + \frac{e(ad-bc)}{(dx+c)d}\right) - \frac{Bad}{2i(ad-bc)^2g} \left(\ln\left(\frac{be}{d} + \frac{e(ad-bc)}{(dx+c)d}\right)\right)^2 + \dots$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i),x)`

[Out]  $-d/i/(a*d-b*c)^2/g*A*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+1/i/(a*d-b*c)^2/g*A*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c-1/2*d/i/(a*d-b*c)^2/g*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+1/2/i/(a*d-b*c)^2/g*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b*c$

**Maxima [B]** time = 1.17217, size = 232, normalized size = 5.27

$$B\left(\frac{\log(bx+a)}{(bc-ad)gi} - \frac{\log(dx+c)}{(bc-ad)gi}\right) \log\left(\frac{bex}{dx+c} + \frac{ae}{dx+c}\right) + A\left(\frac{\log(bx+a)}{(bc-ad)gi} - \frac{\log(dx+c)}{(bc-ad)gi}\right) - \frac{(\log(bx+a))^2 - 2\log(bx+a)\log(dx+c)}{2(bc-ad)gi}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i),x, algorithm="maxima")`

[Out]  $B*(\log(b*x + a)/((b*c - a*d)*g*i) - \log(d*x + c)/((b*c - a*d)*g*i))*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) + A*(\log(b*x + a)/((b*c - a*d)*g*i) - \log(d*x + c)/((b*c - a*d)*g*i)) - 1/2*(\log(b*x + a))^2 - 2*\log(b*x + a)*\log(d*x + c) + \log(d*x + c)^2)*B/(b*c*g*i - a*d*g*i)$

---

**Fricas [A]** time = 0.493947, size = 126, normalized size = 2.86

$$\frac{B \log\left(\frac{bex+ae}{dx+c}\right)^2 + 2 A \log\left(\frac{bex+ae}{dx+c}\right)}{2(bc-ad)gi}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)/(d\*i\*x+c\*i),x, algorithm="fricas")

[Out] 1/2\*(B\*log((b\*e\*x + a\*e)/(d\*x + c))^2 + 2\*A\*log((b\*e\*x + a\*e)/(d\*x + c)))/(b\*c - a\*d)\*g\*i)

---

**Sympy [B]** time = 1.5322, size = 170, normalized size = 3.86

$$A \left( \frac{\log\left(x + \frac{-\frac{a^2d^2}{ad-bc} + \frac{2abcd}{ad-bc} + ad - \frac{b^2c^2}{ad-bc} + bc}{2bd}\right)}{gi(ad-bc)} - \frac{\log\left(x + \frac{\frac{a^2d^2}{ad-bc} - \frac{2abcd}{ad-bc} + ad + \frac{b^2c^2}{ad-bc} + bc}{2bd}\right)}{gi(ad-bc)} \right) - \frac{B \log\left(\frac{e(a+bx)}{c+dx}\right)^2}{2adgi - 2bcgi}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)/(d\*i\*x+c\*i),x)

[Out] A\*(log(x + (-a\*\*2\*d\*\*2/(a\*d - b\*c) + 2\*a\*b\*c\*d/(a\*d - b\*c) + a\*d - b\*\*2\*c\*\*2/(a\*d - b\*c) + b\*c)/(2\*b\*d))/(g\*i\*(a\*d - b\*c)) - log(x + (a\*\*2\*d\*\*2/(a\*d - b\*c) - 2\*a\*b\*c\*d/(a\*d - b\*c) + a\*d + b\*\*2\*c\*\*2/(a\*d - b\*c) + b\*c)/(2\*b\*d))/(g\*i\*(a\*d - b\*c)) - B\*log(e\*(a + b\*x)/(c + d\*x))\*\*2/(2\*a\*d\*g\*i - 2\*b\*c\*g\*i)

---

**Giac [B]** time = 1.3858, size = 142, normalized size = 3.23

$$\frac{Bi \log\left(\frac{bx+a}{dx+c}\right)^2}{2(bcg-adg)} - \frac{(Ai+Bi) \log\left(\left|\frac{2bdx+bc+ad-|-bc+ad|}{2bdx+bc+ad+|-bc+ad|}\right|\right)}{g|-bc+ad|}$$

Verification of antiderivative is not currently implemented for this CAS.



```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i),x, algorithm="giac")
```

```
[Out] -1/2*B*i*log((b*x + a)/(d*x + c))^2/(b*c*g - a*d*g) - (A*i + B*i)*log(abs((2*b*d*x + b*c + a*d - abs(-b*c + a*d))/(2*b*d*x + b*c + a*d + abs(-b*c + a*d))))/(g*abs(-b*c + a*d))
```

$$3.36 \quad \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^2(ci+dix)} dx$$

**Optimal.** Leaf size=173

$$\frac{d \log\left(\frac{a+bx}{c+dx}\right) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{g^2 i (bc - ad)^2} - \frac{b(c + dx) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{g^2 i (a + bx)(bc - ad)^2} - \frac{bB(c + dx)}{g^2 i (a + bx)(bc - ad)^2} + \frac{Bd \log^2\left(\frac{a+bx}{c+dx}\right)}{2g^2 i (bc - ad)^2}$$

[Out]  $-\left(\frac{bB(c + dx)}{g^2 i (a + bx)(bc - ad)^2}\right) + \left(\frac{Bd \log^2\left(\frac{a+bx}{c+dx}\right)}{2g^2 i (bc - ad)^2}\right) - \left(\frac{b(c + dx) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{g^2 i (a + bx)(bc - ad)^2}\right) + \left(\frac{d \log\left(\frac{a+bx}{c+dx}\right) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{g^2 i (bc - ad)^2}\right)$

**Rubi [C]** time = 0.703046, antiderivative size = 437, normalized size of antiderivative = 2.53, number of steps used = 24, number of rules used = 11, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.275$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{Bd \text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{g^2 i (bc - ad)^2} - \frac{Bd \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{g^2 i (bc - ad)^2} - \frac{d \log(a + bx) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{g^2 i (bc - ad)^2} - \frac{B \log\left(\frac{e(a+bx)}{c+dx}\right) + A}{g^2 i (a + bx)(bc - ad)} + \frac{d \log\left(\frac{a+bx}{c+dx}\right)}{g^2 i (bc - ad)}$$

Antiderivative was successfully verified.

[In] `Int[(A + B*Log[(e*(a + b*x))/(c + d*x]))/((a*g + b*g*x)^2*(c*i + d*i*x)),x]`

[Out]  $-\left(\frac{Bd \text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{g^2 i (bc - ad)^2}\right) - \left(\frac{Bd \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{g^2 i (bc - ad)^2}\right) - \left(\frac{d \log(a + bx) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{g^2 i (bc - ad)^2}\right) - \left(\frac{B \log\left(\frac{e(a+bx)}{c+dx}\right) + A}{g^2 i (a + bx)(bc - ad)}\right) + \left(\frac{d \log\left(\frac{a+bx}{c+dx}\right)}{g^2 i (bc - ad)}\right)$

**Rule 2528**

`Int[(a_. + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x]`

onQ[RGx, x] && IGtQ[n, 0]

### Rule 2525

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*((d\_.) + (e\_.)\*(x\_))^(m\_.), x\_Symbol] := Simp[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^n)/(e\*(m + 1)), x] - Dist[(b\*n\*p)/(e\*(m + 1)), Int[SimplifyIntegrand[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

### Rule 12

Int[(a\_)\*(u\_), x\_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b\_)\*(v\_) /; FreeQ[b, x]]

### Rule 44

Int[((a\_) + (b\_.)\*(x\_))^(m\_.)\*((c\_.) + (d\_.)\*(x\_))^(n\_.), x\_Symbol] := Int[ExpandIntegrand[(a + b\*x)^m\*(c + d\*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b\*c - a\*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])

### Rule 2524

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^n)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

### Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*(RFx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]

### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.)\*(x\_))^(q\_.), x\_Symbol] := Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}
\int \frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(36c + 36dx)(ag + bgx)^2} dx &= \int \left( \frac{b \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{36(bc - ad)g^2(a + bx)^2} - \frac{bd \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{36(bc - ad)^2g^2(a + bx)} + \frac{d^2 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{36(bc - ad)^2g^2(c + dx)} \right) dx \\
&= -\frac{(bd) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx} dx}{36(bc - ad)^2g^2} + \frac{d^2 \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx} dx}{36(bc - ad)^2g^2} + \frac{b \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2} dx}{36(bc - ad)g^2} \\
&= -\frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{36(bc - ad)g^2(a + bx)} - \frac{d \log(a + bx) \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{36(bc - ad)^2g^2} + \frac{d \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{36(bc - ad)} \\
&= -\frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{36(bc - ad)g^2(a + bx)} - \frac{d \log(a + bx) \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{36(bc - ad)^2g^2} + \frac{d \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{36(bc - ad)} \\
&= -\frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{36(bc - ad)g^2(a + bx)} - \frac{d \log(a + bx) \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{36(bc - ad)^2g^2} + \frac{d \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{36(bc - ad)} \\
&= -\frac{B}{36(bc - ad)g^2(a + bx)} - \frac{Bd \log(a + bx)}{36(bc - ad)^2g^2} - \frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{36(bc - ad)g^2(a + bx)} - \frac{d \log(a + bx) \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{36(bc - ad)} \\
&= -\frac{B}{36(bc - ad)g^2(a + bx)} - \frac{Bd \log(a + bx)}{36(bc - ad)^2g^2} - \frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{36(bc - ad)g^2(a + bx)} - \frac{d \log(a + bx) \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{36(bc - ad)} \\
&= -\frac{B}{36(bc - ad)g^2(a + bx)} - \frac{Bd \log(a + bx)}{36(bc - ad)^2g^2} + \frac{Bd \log^2(a + bx)}{72(bc - ad)^2g^2} - \frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{36(bc - ad)g^2(a + bx)} \\
&= -\frac{B}{36(bc - ad)g^2(a + bx)} - \frac{Bd \log(a + bx)}{36(bc - ad)^2g^2} + \frac{Bd \log^2(a + bx)}{72(bc - ad)^2g^2} - \frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{36(bc - ad)g^2(a + bx)}
\end{aligned}$$

**Mathematica [C]** time = 0.298984, size = 292, normalized size = 1.69

$$-\frac{Bd(a + bx) \left( \log(a + bx) \left( \log(a + bx) - 2 \log\left(\frac{b(c+dx)}{bc-ad}\right) \right) - 2 \text{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) \right) + Bd(a + bx) \left( 2 \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right) \right)}{36(bc - ad)g^2(a + bx)}$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))/((a\*g + b\*g\*x)^2\*(c\*i + d\*i\*x)), x]

```
[Out] -(2*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x])) + 2*d*(a + b*x)*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x])) - 2*d*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + 2*B*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - B*d*(a + b*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-b*c) + a*d]) + B*d*(a + b*x)*((2*Log[(d*(a + b*x))/(-b*c) + a*d]) - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)))/(2*(b*c - a*d)^2*g^2*i*(a + b*x))
```

**Maple [B]** time = 0.056, size = 605, normalized size = 3.5

$$-\frac{d^2 A a}{i(ad-bc)^3 g^2} \ln\left(\frac{be}{d} + \frac{e(ad-bc)}{(dx+c)d}\right) + \frac{dAbc}{i(ad-bc)^3 g^2} \ln\left(\frac{be}{d} + \frac{e(ad-bc)}{(dx+c)d}\right) - \frac{deAba}{i(ad-bc)^3 g^2} \left(\frac{be}{d} + \frac{ae}{dx+c} - \frac{bec}{(dx+c)d}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2/(d*i*x+c*i),x)
```

```
[Out] -d^2/i/(a*d-b*c)^3/g^2*A*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+d/i/(a*d-b*c)^3/g^2*A*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c-e*d/i/(a*d-b*c)^3/g^2*A*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+e/i/(a*d-b*c)^3/g^2*A*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c-1/2*d^2/i/(a*d-b*c)^3/g^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+1/2*d/i/(a*d-b*c)^3/g^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b*c-e*d/i/(a*d-b*c)^3/g^2*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+e/i/(a*d-b*c)^3/g^2*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-e*d/i/(a*d-b*c)^3/g^2*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+e/i/(a*d-b*c)^3/g^2*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c
```

**Maxima [B]** time = 1.30179, size = 572, normalized size = 3.31

$$-B\left(\frac{1}{(b^2c-abd)g^2ix+(abc-a^2d)g^2i} + \frac{d \log(bx+a)}{(b^2c^2-2abcd+a^2d^2)g^2i} - \frac{d \log(dx+c)}{(b^2c^2-2abcd+a^2d^2)g^2i}\right) \log\left(\frac{bex}{dx+c} + \frac{ae}{dx+c}\right) -$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2/(d*i*x+c*i),x, algorithm="maxima")
```

```
[Out] -B*(1/((b^2*c - a*b*d)*g^2*i*x + (a*b*c - a^2*d)*g^2*i) + d*log(b*x + a)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g^2*i) - d*log(d*x + c)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g^2*i))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - A*(1/((b^2*c - a*b*d)*g^2*i*x + (a*b*c - a^2*d)*g^2*i) + d*log(b*x + a)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g^2*i) - d*log(d*x + c)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g^2*i)) + 1/2*((b*d*x + a*d)*log(b*x + a)^2 + (b*d*x + a*d)*log(d*x + c)^2 - 2*b*c + 2*a*d - 2*(b*d*x + a*d)*log(b*x + a) + 2*(b*d*x + a*d - (b*d*x + a*d)*log(b*x + a))*log(d*x + c))*B/(a*b^2*c^2*g^2*i - 2*a^2*b*c*d*g^2*i + a^3*d^2*g^2*i + (b^3*c^2*g^2*i - 2*a*b^2*c*d*g^2*i + a^2*b*d^2*g^2*i)*x)
```

**Fricas [A]** time = 0.509202, size = 329, normalized size = 1.9

$$\frac{2(A+B)bc - 2(A+B)ad + (Bbdx + Bad) \log\left(\frac{bex+ae}{dx+c}\right)^2 + 2((A+B)bdx + Bbc + Aad) \log\left(\frac{bex+ae}{dx+c}\right)}{2\left((b^3c^2 - 2ab^2cd + a^2bd^2)g^2ix + (ab^2c^2 - 2a^2bcd + a^3d^2)g^2i\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2/(d*i*x+c*i),x, algorithm="fricas")
```

```
[Out] -1/2*(2*(A + B)*b*c - 2*(A + B)*a*d + (B*b*d*x + B*a*d)*log((b*e*x + a*e)/(d*x + c))^2 + 2*((A + B)*b*d*x + B*b*c + A*a*d)*log((b*e*x + a*e)/(d*x + c)))/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^2*i*x + (a*b^2*c^2 - 2*a^2*b*c*d + a^3*d^2)*g^2*i)
```

**Sympy [B]** time = 3.0551, size = 386, normalized size = 2.23

$$\frac{Bd \log\left(\frac{e(a+bx)}{c+dx}\right)^2}{2a^2d^2g^2i - 4abcdg^2i + 2b^2c^2g^2i} + \frac{B \log\left(\frac{e(a+bx)}{c+dx}\right)}{a^2dg^2i - abcg^2i + abdg^2ix - b^2cg^2ix} + (A+B) \left( \frac{d \log\left(x + \frac{-\frac{a^3d^4}{(ad-bc)^2} + \frac{3a^2bcd^3}{(ad-bc)^2} - \frac{3ab^2c^2d^2}{(ad-bc)^2} + a}{2bd^2}\right)}{g^2i(ad-bc)^2} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**2/(d*i*x+c*i),x)
```

```
[Out] -B*d*log(e*(a + b*x)/(c + d*x))**2/(2*a**2*d**2*g**2*i - 4*a*b*c*d*g**2*i +
2*b**2*c**2*g**2*i) + B*log(e*(a + b*x)/(c + d*x))/(a**2*d*g**2*i - a*b*c*
g**2*i + a*b*d*g**2*i*x - b**2*c*g**2*i*x) + (A + B)*(d*log(x + (-a**3*d**4
/(a*d - b*c)**2 + 3*a**2*b*c*d**3/(a*d - b*c)**2 - 3*a*b**2*c**2*d**2/(a*d
- b*c)**2 + a*d**2 + b**3*c**3*d/(a*d - b*c)**2 + b*c*d)/(2*b*d**2)))/(g**2*
i*(a*d - b*c)**2) - d*log(x + (a**3*d**4/(a*d - b*c)**2 - 3*a**2*b*c*d**3/(
a*d - b*c)**2 + 3*a*b**2*c**2*d**2/(a*d - b*c)**2 + a*d**2 - b**3*c**3*d/(a
*d - b*c)**2 + b*c*d)/(2*b*d**2)))/(g**2*i*(a*d - b*c)**2) + 1/(a**2*d*g**2*
i - a*b*c*g**2*i + x*(a*b*d*g**2*i - b**2*c*g**2*i))
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{B \log\left(\frac{(bx+a)e}{dx+c}\right) + A}{(bgx + ag)^2(dx + ci)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2/(d*i*x+c*i),x, algorit
hm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)/((b*g*x + a*g)^2*(d*i*x + c*i)
), x)
```



$$3.37 \quad \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^3(ci+dix)} dx$$

**Optimal.** Leaf size=255

$$-\frac{b^2(c+dx)^2\left(B \log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g^3i(a+bx)^2(bc-ad)^3} + \frac{d^2 \log\left(\frac{a+bx}{c+dx}\right)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^3i(bc-ad)^3} + \frac{2bd(c+dx)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^3i(a+bx)(bc-ad)^3} - \frac{Bd^2 \log^2\left(\frac{e(a+bx)}{c+dx}\right)}{2g^3i(bc-ad)^3}$$

[Out]  $-(B*(c+d*x)^2*(b-(4*d*(a+b*x))/(c+d*x))^2)/(4*(b*c-a*d)^3*g^3*i*(a+b*x)^2) - (B*d^2*Log[(a+b*x)/(c+d*x)]^2)/(2*(b*c-a*d)^3*g^3*i + (2*b*d*(c+d*x)*(A+B*Log[(e*(a+b*x))/(c+d*x]]))/(b*c-a*d)^3*g^3*i*(a+b*x)) - (b^2*(c+d*x)^2*(A+B*Log[(e*(a+b*x))/(c+d*x]]))/(2*(b*c-a*d)^3*g^3*i*(a+b*x)^2) + (d^2*Log[(a+b*x)/(c+d*x)]*(A+B*Log[(e*(a+b*x))/(c+d*x]]))/(b*c-a*d)^3*g^3*i)$

**Rubi [C]** time = 0.877028, antiderivative size = 535, normalized size of antiderivative = 2.1, number of steps used = 28, number of rules used = 11, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.275$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{Bd^2 \text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{g^3i(bc-ad)^3} + \frac{Bd^2 \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{g^3i(bc-ad)^3} + \frac{d^2 \log(a+bx)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^3i(bc-ad)^3} - \frac{d^2 \log(c+dx)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^3i(bc-ad)^3}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[(A+B*Log[(e*(a+b*x))/(c+d*x]])/((a*g+b*g*x)^3*(c*i+d*i*x)),x]$

[Out]  $-B/(4*(b*c-a*d)*g^3*i*(a+b*x)^2) + (3*B*d)/(2*(b*c-a*d)^2*g^3*i*(a+b*x)) + (3*B*d^2*Log[a+b*x])/(2*(b*c-a*d)^3*g^3*i) - (B*d^2*Log[a+b*x]^2)/(2*(b*c-a*d)^3*g^3*i) - (A+B*Log[(e*(a+b*x))/(c+d*x]])/(2*(b*c-a*d)*g^3*i*(a+b*x)^2) + (d*(A+B*Log[(e*(a+b*x))/(c+d*x]]))/(b*c-a*d)^2*g^3*i*(a+b*x) + (d^2*Log[a+b*x]*(A+B*Log[(e*(a+b*x))/(c+d*x]]))/(b*c-a*d)^3*g^3*i - (3*B*d^2*Log[c+d*x])/(2*(b*c-a*d)^3*g^3*i) + (B*d^2*Log[-((d*(a+b*x))/(b*c-a*d))]*Log[c+d*x])/(b*c-a*d)^3*g^3*i - (d^2*(A+B*Log[(e*(a+b*x))/(c+d*x]])*Log[c+d*x])/(b*c-a*d)^3*g^3*i - (B*d^2*Log[c+d*x]^2)/(2*(b*c-a*d)^3*g^3*i) + (B*d^2*Log[a+b*x]*Log[(b*(c+d*x))/(b*c-a*d)])/(b*c-a*d)^3*g^3*i + (B*d^2*PolyLog[2, -((d*(a+b*x))/(b*c-a*d))])/(b*c-a*d)^3*g^3*i + (B*d^2*PolyLog[2, (b*(c+d*x))/(b*c-a*d)])/(b*c-a*d)^3*g^3*i$

Rule 2528

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(Rfx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, Rfx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
Rfx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
```

$(x)^{(q)}$ , x\_Symbol] := Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_) + Log[(c\_)\*(x\_)^(n\_)])\*(b\_)/(x\_), x\_Symbol] := Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rule 2394

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_)^(n\_))])\*(b\_)/((f\_) + (g\_)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_))])\*(b\_)/((f\_) + (g\_)\*(x\_)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_)\*((d\_) + (e\_)\*(x\_)^(n\_))]/(x\_), x\_Symbol] := -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rubi steps

$$\begin{aligned}
\int \frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(37c + 37dx)(ag + bgx)^3} dx &= \int \left( \frac{b \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{37(bc - ad)g^3(a + bx)^3} - \frac{bd \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{37(bc - ad)^2g^3(a + bx)^2} + \frac{bd^2 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{37(bc - ad)^3g^3(a + bx)} - \frac{d^3}{37(bc - ad)^3g^3} \right) dx \\
&= \frac{(bd^2) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx} dx}{37(bc - ad)^3g^3} - \frac{d^3 \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx} dx}{37(bc - ad)^3g^3} - \frac{(bd) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2} dx}{37(bc - ad)^2g^3} + \frac{b \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx} dx}{37(bc - ad)^3g^3} \\
&= -\frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{74(bc - ad)g^3(a + bx)^2} + \frac{d \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{37(bc - ad)^2g^3(a + bx)} + \frac{d^2 \log(a + bx) \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{37(bc - ad)^3g^3} \\
&= -\frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{74(bc - ad)g^3(a + bx)^2} + \frac{d \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{37(bc - ad)^2g^3(a + bx)} + \frac{d^2 \log(a + bx) \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{37(bc - ad)^3g^3} \\
&= -\frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{74(bc - ad)g^3(a + bx)^2} + \frac{d \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{37(bc - ad)^2g^3(a + bx)} + \frac{d^2 \log(a + bx) \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{37(bc - ad)^3g^3} \\
&= -\frac{B}{148(bc - ad)g^3(a + bx)^2} + \frac{3Bd}{74(bc - ad)^2g^3(a + bx)} + \frac{3Bd^2 \log(a + bx)}{74(bc - ad)^3g^3} - \frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{74(bc - ad)g^3(a + bx)} \\
&= -\frac{B}{148(bc - ad)g^3(a + bx)^2} + \frac{3Bd}{74(bc - ad)^2g^3(a + bx)} + \frac{3Bd^2 \log(a + bx)}{74(bc - ad)^3g^3} - \frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{74(bc - ad)g^3(a + bx)} \\
&= -\frac{B}{148(bc - ad)g^3(a + bx)^2} + \frac{3Bd}{74(bc - ad)^2g^3(a + bx)} + \frac{3Bd^2 \log(a + bx)}{74(bc - ad)^3g^3} - \frac{Bd^2 \log^2(a + bx)}{74(bc - ad)^3g^3} \\
&= -\frac{B}{148(bc - ad)g^3(a + bx)^2} + \frac{3Bd}{74(bc - ad)^2g^3(a + bx)} + \frac{3Bd^2 \log(a + bx)}{74(bc - ad)^3g^3} - \frac{Bd^2 \log^2(a + bx)}{74(bc - ad)^3g^3}
\end{aligned}$$

**Mathematica [C]** time = 0.378282, size = 418, normalized size = 1.64

$$-2Bd^2(a + bx)^2 \left( \log(a + bx) \left( \log(a + bx) - 2 \log\left(\frac{b(c+dx)}{bc-ad}\right) \right) - 2 \text{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) \right) + 2Bd^2(a + bx)^2 \left( 2 \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right) \right)$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))/((a\*g + b\*g\*x)^3\*(c\*i + d\*i\*x)), x]

```
[Out] (-2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x])) + 4*d*(b*c - a*d)*(a
+ b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x])) + 4*d^2*(a + b*x)^2*Log[a + b*
x]*(A + B*Log[(e*(a + b*x))/(c + d*x])) - 4*d^2*(a + b*x)^2*(A + B*Log[(e*(
a + b*x))/(c + d*x]))*Log[c + d*x] + 4*B*d*(a + b*x)*(b*c - a*d + d*(a + b*
x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - B*((b*c - a*d)^2 + 2*d*(-(b*c
) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log
[c + d*x]) - 2*B*d^2*(a + b*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c
+ d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*B*d
^2*(a + b*x)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c
+ d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(4*(b*c - a*d)^3*g^3*i*(
a + b*x)^2)
```

**Maple [B]** time = 0.055, size = 1040, normalized size = 4.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3/(d*i*x+c*i), x)
```

```
[Out] -d^3/i/(a*d-b*c)^4/g^3*A*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+d^2/i/(a*d-b*c)^
4/g^3*A*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c-2*e*d^2/i/(a*d-b*c)^4/g^3*A*b/(
b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+2*e*d/i/(a*d-b*c)^4/g^3*A*b^2/(b*e/d+e
/(d*x+c)*a-e/d/(d*x+c)*b*c)*c+1/2*e^2*d/i/(a*d-b*c)^4/g^3*A*b^2/(b*e/d+e/(d
*x+c)*a-e/d/(d*x+c)*b*c)^2*a-1/2*e^2/i/(a*d-b*c)^4/g^3*A*b^3/(b*e/d+e/(d*x+
c)*a-e/d/(d*x+c)*b*c)^2*c-1/2*d^3/i/(a*d-b*c)^4/g^3*B*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))^2*a+1/2*d^2/i/(a*d-b*c)^4/g^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^
2*b*c-2*e*d^2/i/(a*d-b*c)^4/g^3*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+2*e*d/i/(a*d-b*c)^4/g^3*B*b^2/(b*e/d+e/(d*x+
c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-2*e*d^2/i/(a*d-b*c)
^4/g^3*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+2*e*d/i/(a*d-b*c)^4/g^3*B*
b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c+1/2*e^2*d/i/(a*d-b*c)^4/g^3*B*b^2
/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-1/
2*e^2/i/(a*d-b*c)^4/g^3*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))*c+1/4*e^2*d/i/(a*d-b*c)^4/g^3*B*b^2/(b*e/d+e/(d*x+
c)*a-e/d/(d*x+c)*b*c)^2*a-1/4*e^2/i/(a*d-b*c)^4/g^3*B*b^3/(b*e/d+e/(d*x+c)*
a-e/d/(d*x+c)*b*c)^2*c
```

**Maxima [B]** time = 1.5394, size = 1195, normalized size = 4.69

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3/(d*i*x+c*i),x, algorithm="maxima")
```

```
[Out] 1/2*B*((2*b*d*x - b*c + 3*a*d)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3*i*x^2 + 2*(a*b^3*c^2 - 2*a^2*b^2*c*d + a^3*b*d^2)*g^3*i*x + (a^2*b^2*c^2 - 2*a^3*b*c*d + a^4*d^2)*g^3*i) + 2*d^2*log(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i) - 2*d^2*log(d*x + c)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 1/2*A*((2*b*d*x - b*c + 3*a*d)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3*i*x^2 + 2*(a*b^3*c^2 - 2*a^2*b^2*c*d + a^3*b*d^2)*g^3*i*x + (a^2*b^2*c^2 - 2*a^3*b*c*d + a^4*d^2)*g^3*i) + 2*d^2*log(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i) - 2*d^2*log(d*x + c)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i)) - 1/4*(b^2*c^2 - 8*a*b*c*d + 7*a^2*d^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a)^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(d*x + c)^2 - 6*(b^2*c*d - a*b*d^2)*x - 6*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a) + 2*(3*b^2*d^2*x^2 + 6*a*b*d^2*x + 3*a^2*d^2 - 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a))*log(d*x + c))*B/(a^2*b^3*c^3*g^3*i - 3*a^3*b^2*c^2*d*g^3*i + 3*a^4*b*c*d^2*g^3*i - a^5*d^3*g^3*i + (b^5*c^3*g^3*i - 3*a*b^4*c^2*d*g^3*i + 3*a^2*b^3*c*d^2*g^3*i - a^3*b^2*d^3*g^3*i)*x^2 + 2*(a*b^4*c^3*g^3*i - 3*a^2*b^3*c^2*d*g^3*i + 3*a^3*b^2*c*d^2*g^3*i - a^4*b*d^3*g^3*i)*x)
```

**Fricas [A]** time = 0.48864, size = 732, normalized size = 2.87

$$\frac{(2A + B)b^2c^2 - 8(A + B)abcd + (6A + 7B)a^2d^2 - 2(Bb^2d^2x^2 + 2Babd^2x + Ba^2d^2) \log\left(\frac{bex+ae}{dx+c}\right)^2 - 2((2A + 3B)b^2cd - 4((b^5c^3 - 3ab^4c^2d + 3a^2b^3cd^2 - a^3b^2d^3)g^3ix^2 + 2(ab^4c^3 - 3a^2b^3c^2d + 3a^3b^2c^2d^2 - a^4b^2cd^3)g^3ix + (a^2b^3c^3 - 3a^3b^2c^2d + 3a^4b^2cd^2 -$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3/(d*i*x+c*i),x, algorithm="fricas")
```

```
[Out] -1/4*((2*A + B)*b^2*c^2 - 8*(A + B)*a*b*c*d + (6*A + 7*B)*a^2*d^2 - 2*(B*b^2*d^2*x^2 + 2*B*a*b*d^2*x + B*a^2*d^2)*log((b*e*x + a*e)/(d*x + c))^2 - 2*((2*A + 3*B)*b^2*c*d - (2*A + 3*B)*a*b*d^2)*x - 2*((2*A + 3*B)*b^2*d^2*x^2 - B*b^2*c^2 + 4*B*a*b*c*d + 2*A*a^2*d^2 + 2*(B*b^2*c*d + 2*(A + B)*a*b*d^2)*x)*log((b*e*x + a*e)/(d*x + c))/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^3*i*x^2 + 2*(a*b^4*c^3 - 3*a^2*b^3*c^2*d + 3*a^3*b^2*c*d^2 - a^4*b^2*d^3)*g^3*i*x + (a^2*b^3*c^3 - 3*a^3*b^2*c^2*d + 3*a^4*b^2*c*d^2 -
```

$a^5 d^3) g^3 i)$

**Sympy [B]** time = 7.53382, size = 889, normalized size = 3.49

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)\*\*3/(d\*i\*x+c\*i),x)

[Out] 
$$-B*d**2*log(e*(a + b*x)/(c + d*x))**2/(2*a**3*d**3*g**3*i - 6*a**2*b*c*d**2*g**3*i + 6*a*b**2*c**2*d*g**3*i - 2*b**3*c**3*g**3*i) + d**2*(2*A + 3*B)*log(x + (2*A*a*d**3 + 2*A*b*c*d**2 + 3*B*a*d**3 + 3*B*b*c*d**2 - a**4*d**6*(2*A + 3*B)/(a*d - b*c)**3 + 4*a**3*b*c*d**5*(2*A + 3*B)/(a*d - b*c)**3 - 6*a**2*b**2*c**2*d**4*(2*A + 3*B)/(a*d - b*c)**3 + 4*a*b**3*c**3*d**3*(2*A + 3*B)/(a*d - b*c)**3 - b**4*c**4*d**2*(2*A + 3*B)/(a*d - b*c)**3)/(4*A*b*d**3 + 6*B*b*d**3))/(2*g**3*i*(a*d - b*c)**3) - d**2*(2*A + 3*B)*log(x + (2*A*a*d**3 + 2*A*b*c*d**2 + 3*B*a*d**3 + 3*B*b*c*d**2 + a**4*d**6*(2*A + 3*B)/(a*d - b*c)**3 - 4*a**3*b*c*d**5*(2*A + 3*B)/(a*d - b*c)**3 + 6*a**2*b**2*c**2*d**4*(2*A + 3*B)/(a*d - b*c)**3 - 4*a*b**3*c**3*d**3*(2*A + 3*B)/(a*d - b*c)**3 + b**4*c**4*d**2*(2*A + 3*B)/(a*d - b*c)**3)/(4*A*b*d**3 + 6*B*b*d**3))/(2*g**3*i*(a*d - b*c)**3) + (3*B*a*d - B*b*c + 2*B*b*d*x)*log(e*(a + b*x)/(c + d*x))/(2*a**4*d**2*g**3*i - 4*a**3*b*c*d*g**3*i + 4*a**3*b*d**2*g**3*i*x + 2*a**2*b**2*c**2*g**3*i - 8*a**2*b**2*c*d*g**3*i*x + 2*a**2*b**2*d**2*g**3*i*x**2 + 4*a*b**3*c**2*g**3*i*x - 4*a*b**3*c*d*g**3*i*x**2 + 2*b**4*c**2*g**3*i*x**2) + (6*A*a*d - 2*A*b*c + 7*B*a*d - B*b*c + x*(4*A*b*d + 6*B*b*d))/(4*a**4*d**2*g**3*i - 8*a**3*b*c*d*g**3*i + 4*a**2*b**2*c**2*g**3*i + x**2*(4*a**2*b**2*d**2*g**3*i - 8*a*b**3*c*d*g**3*i + 4*b**4*c**2*g**3*i) + x*(8*a**3*b*d**2*g**3*i - 16*a**2*b**2*c*d*g**3*i + 8*a*b**3*c**2*g**3*i))$$

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{B \log\left(\frac{(bx+a)e}{dx+c}\right) + A}{(bgx + ag)^3 (dix + ci)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3/(d*i*x+c*i),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)/((b*g*x + a*g)^3*(d*i*x + c*i)), x)
```



$$3.38 \quad \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^4(ci+dix)} dx$$

**Optimal.** Leaf size=373

$$\frac{3b^2d(c+dx)^2 \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{2g^4i(a+bx)^2(bc-ad)^4} - \frac{b^3(c+dx)^3 \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{3g^4i(a+bx)^3(bc-ad)^4} - \frac{d^3 \log\left(\frac{a+bx}{c+dx}\right) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{g^4i(bc-ad)^4} - \frac{3bd^2(c+dx)}{g^4i(bc-ad)^4}$$

[Out]  $(-3*b*B*d^2*(c+d*x))/((b*c-a*d)^4*g^4*i*(a+b*x)) + (3*b^2*B*d*(c+d*x)^2)/(4*(b*c-a*d)^4*g^4*i*(a+b*x)^2) - (b^3*B*(c+d*x)^3)/(9*(b*c-a*d)^4*g^4*i*(a+b*x)^3) + (B*d^3*Log[(a+b*x)/(c+d*x)]^2)/(2*(b*c-a*d)^4*g^4*i) - (3*b*d^2*(c+d*x)*(A+B*Log[(e*(a+b*x))/(c+d*x]]))/((b*c-a*d)^4*g^4*i*(a+b*x)) + (3*b^2*d*(c+d*x)^2*(A+B*Log[(e*(a+b*x))/(c+d*x]]))/(2*(b*c-a*d)^4*g^4*i*(a+b*x)^2) - (b^3*(c+d*x)^3*(A+B*Log[(e*(a+b*x))/(c+d*x]]))/(3*(b*c-a*d)^4*g^4*i*(a+b*x)^3) - (d^3*Log[(a+b*x)/(c+d*x)]*(A+B*Log[(e*(a+b*x))/(c+d*x]]))/((b*c-a*d)^4*g^4*i)$

**Rubi [C]** time = 1.07811, antiderivative size = 620, normalized size of antiderivative = 1.66, number of steps used = 32, number of rules used = 11, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.275$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{Bd^3 \text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{g^4i(bc-ad)^4} - \frac{Bd^3 \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{g^4i(bc-ad)^4} - \frac{d^3 \log(a+bx) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{g^4i(bc-ad)^4} + \frac{d^3 \log(c+dx) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{g^4i(bc-ad)^4}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))/((a\*g + b\*g\*x)^4\*(c\*i + d\*i\*x)),x]

[Out]  $-B/(9*(b*c-a*d)*g^4*i*(a+b*x)^3) + (5*B*d)/(12*(b*c-a*d)^2*g^4*i*(a+b*x)^2) - (11*B*d^2)/(6*(b*c-a*d)^3*g^4*i*(a+b*x)) - (11*B*d^3*Log[a+b*x])/((6*(b*c-a*d)^4*g^4*i) + (B*d^3*Log[a+b*x]^2)/(2*(b*c-a*d)^4*g^4*i) - (A+B*Log[(e*(a+b*x))/(c+d*x]])/(3*(b*c-a*d)*g^4*i*(a+b*x)^3) + (d*(A+B*Log[(e*(a+b*x))/(c+d*x]]))/(2*(b*c-a*d)^2*g^4*i*(a+b*x)^2) - (d^2*(A+B*Log[(e*(a+b*x))/(c+d*x]]))/((b*c-a*d)^3*g^4*i*(a+b*x)) - (d^3*Log[a+b*x]*(A+B*Log[(e*(a+b*x))/(c+d*x]]))/((b*c-a*d)^4*g^4*i) + (11*B*d^3*Log[c+d*x])/((6*(b*c-a*d)^4*g^4*i) - (B*d^3*Log[-((d*(a+b*x))/(b*c-a*d))]*Log[c+d*x])/((b*c-a*d)^4*g^4*i) + (d^3*(A+B*Log[(e*(a+b*x))/(c+d*x]])*Log[c+d*x])/((b*c-a*d)^4*g^4*i) + (B*d^3*Log[c+d*x]^2)/(2*(b*c-a*d)^4*g^4*i) - (B*d^3*Log[a+b*x]*Log[(b$

$$\frac{(c + dx)}{(b^2c - a^2d)} \frac{1}{(b^2c - a^2d)^4 g^{4i}} - (B^2d^3 \text{PolyLog}[2, -((d(a + bx))/(b^2c - a^2d))]) \frac{1}{(b^2c - a^2d)^4 g^{4i}} - (B^2d^3 \text{PolyLog}[2, (b(c + dx))/(b^2c - a^2d)]) \frac{1}{(b^2c - a^2d)^4 g^{4i}}$$

### Rule 2528

Int[((a\_.) + Log[(c\_.)\*(RFX\_)^(p\_.)]\*(b\_.))^(n\_.)\*(RGx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*RFX^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFX, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

### Rule 2525

Int[((a\_.) + Log[(c\_.)\*(RFX\_)^(p\_.)]\*(b\_.))^(n\_.)\*((d\_.) + (e\_.)\*(x\_))^(m\_.), x\_Symbol] := Simp[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFX^p])^n)/(e\*(m + 1)), x] - Dist[(b\*n\*p)/(e\*(m + 1)), Int[SimplifyIntegrand[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFX^p])^(n - 1)\*D[RFX, x])/RFX, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

### Rule 12

Int[(a\_)\*(u\_), x\_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b\_)\*(v\_) /; FreeQ[b, x]]

### Rule 44

Int[((a\_) + (b\_.)\*(x\_))^(m\_.)\*((c\_.) + (d\_.)\*(x\_))^(n\_.), x\_Symbol] := Int[ExpandIntegrand[(a + b\*x)^m\*(c + d\*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b\*c - a\*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])

### Rule 2524

Int[((a\_.) + Log[(c\_.)\*(RFX\_)^(p\_.)]\*(b\_.))^(n\_.)/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[d + e\*x]\*(a + b\*Log[c\*RFX^p])^n)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[d + e\*x]\*(a + b\*Log[c\*RFX^p])^(n - 1)\*D[RFX, x])/RFX, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0]

### Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*(RFX\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n])^p, RFX, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[

Rf[x, x] && IntegerQ[p]

### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.)\*(x\_))^(q\_.), x\_Symbol] := Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] := Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] := -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rubi steps

$$\begin{aligned}
\int \frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(38c + 38dx)(ag + bgx)^4} dx &= \int \left( \frac{b \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{38(bc - ad)g^4(a + bx)^4} - \frac{bd \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{38(bc - ad)^2g^4(a + bx)^3} + \frac{bd^2 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{38(bc - ad)^3g^4(a + bx)^2} - \frac{bd^3 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{38(bc - ad)^4g^4} \right) dx \\
&= -\frac{(bd^3) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx} dx}{38(bc - ad)^4g^4} + \frac{d^4 \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx} dx}{38(bc - ad)^4g^4} + \frac{(bd^2) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2} dx}{38(bc - ad)^3g^4} - \frac{(bd) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^3} dx}{38(bc - ad)^2g^4} \\
&= -\frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{114(bc - ad)g^4(a + bx)^3} + \frac{d \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{76(bc - ad)^2g^4(a + bx)^2} - \frac{d^2 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{38(bc - ad)^3g^4(a + bx)} - \frac{d^3 \log\left(\frac{e(a+bx)}{c+dx}\right)}{38(bc - ad)^4g^4} \\
&= -\frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{114(bc - ad)g^4(a + bx)^3} + \frac{d \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{76(bc - ad)^2g^4(a + bx)^2} - \frac{d^2 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{38(bc - ad)^3g^4(a + bx)} - \frac{d^3 \log\left(\frac{e(a+bx)}{c+dx}\right)}{38(bc - ad)^4g^4} \\
&= -\frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{114(bc - ad)g^4(a + bx)^3} + \frac{d \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{76(bc - ad)^2g^4(a + bx)^2} - \frac{d^2 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{38(bc - ad)^3g^4(a + bx)} - \frac{d^3 \log\left(\frac{e(a+bx)}{c+dx}\right)}{38(bc - ad)^4g^4} \\
&= -\frac{B}{342(bc - ad)g^4(a + bx)^3} + \frac{5Bd}{456(bc - ad)^2g^4(a + bx)^2} - \frac{11Bd^2}{228(bc - ad)^3g^4(a + bx)} - \frac{11Bd^3}{228(bc - ad)^4g^4} \\
&= -\frac{B}{342(bc - ad)g^4(a + bx)^3} + \frac{5Bd}{456(bc - ad)^2g^4(a + bx)^2} - \frac{11Bd^2}{228(bc - ad)^3g^4(a + bx)} - \frac{11Bd^3}{228(bc - ad)^4g^4} \\
&= -\frac{B}{342(bc - ad)g^4(a + bx)^3} + \frac{5Bd}{456(bc - ad)^2g^4(a + bx)^2} - \frac{11Bd^2}{228(bc - ad)^3g^4(a + bx)} - \frac{11Bd^3}{228(bc - ad)^4g^4} \\
&= -\frac{B}{342(bc - ad)g^4(a + bx)^3} + \frac{5Bd}{456(bc - ad)^2g^4(a + bx)^2} - \frac{11Bd^2}{228(bc - ad)^3g^4(a + bx)} - \frac{11Bd^3}{228(bc - ad)^4g^4}
\end{aligned}$$

**Mathematica [C]** time = 0.724539, size = 492, normalized size = 1.32

$$-36Bd^3 \text{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) - 36Bd^3 \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right) + \frac{36Ad^2(ad-bc)}{a+bx} + \frac{18Ad(bc-ad)^2}{(a+bx)^2} - \frac{12A(bc-ad)^3}{(a+bx)^3} - 36Ad^3 \log(a + bx)$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])/((a\*g + b\*g\*x)^4\*(c\*i + d\*i\*x)), x]

```
[Out] ((-12*A*(b*c - a*d)^3)/(a + b*x)^3 - (4*B*(b*c - a*d)^3)/(a + b*x)^3 + (18*
A*d*(b*c - a*d)^2)/(a + b*x)^2 + (15*B*d*(b*c - a*d)^2)/(a + b*x)^2 + (36*A
*d^2*(-(b*c) + a*d))/(a + b*x) + (66*B*d^2*(-(b*c) + a*d))/(a + b*x) - 36*A
*d^3*Log[a + b*x] - 66*B*d^3*Log[a + b*x] + 18*B*d^3*Log[a + b*x]^2 - (12*B
*(b*c - a*d)^3*Log[(e*(a + b*x))/(c + d*x)])/(a + b*x)^3 + (18*B*d*(b*c - a
*d)^2*Log[(e*(a + b*x))/(c + d*x)])/(a + b*x)^2 + (36*B*d^2*(-(b*c) + a*d)*
Log[(e*(a + b*x))/(c + d*x)])/(a + b*x) - 36*B*d^3*Log[a + b*x]*Log[(e*(a +
b*x))/(c + d*x)] + 36*A*d^3*Log[c + d*x] + 66*B*d^3*Log[c + d*x] - 36*B*d^
3*Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[c + d*x] + 36*B*d^3*Log[(e*(a + b*x
))/(c + d*x)]*Log[c + d*x] + 18*B*d^3*Log[c + d*x]^2 - 36*B*d^3*Log[a + b*x
]*Log[(b*(c + d*x))/(b*c - a*d)] - 36*B*d^3*PolyLog[2, (d*(a + b*x))/(-(b*c
) + a*d)] - 36*B*d^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]/(36*(b*c - a*d)
^4*g^4*i)
```

**Maple [B]** time = 0.053, size = 1474, normalized size = 4.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4/(d*i*x+c*i),x)
```

```
[Out] -d^4/i/(a*d-b*c)^5/g^4*A*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+d^3/i/(a*d-b*c)^
5/g^4*A*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c-3*e*d^3/i/(a*d-b*c)^5/g^4*A*b/(
b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+3*e*d^2/i/(a*d-b*c)^5/g^4*A*b^2/(b*e/d
+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c+3/2*e^2*d^2/i/(a*d-b*c)^5/g^4*A*b^2/(b*e/d+
e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a-3/2*e^2*d/i/(a*d-b*c)^5/g^4*A*b^3/(b*e/d+e
/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c-1/3*e^3*d/i/(a*d-b*c)^5/g^4*A*b^3/(b*e/d+e/
(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a+1/3*e^3/i/(a*d-b*c)^5/g^4*A*b^4/(b*e/d+e/(d*
x+c)*a-e/d/(d*x+c)*b*c)^3*c-1/2*d^4/i/(a*d-b*c)^5/g^4*B*ln(b*e/d+(a*d-b*c)*
e/d/(d*x+c))^2*a+1/2*d^3/i/(a*d-b*c)^5/g^4*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)^2*b*c-3*e*d^3/i/(a*d-b*c)^5/g^4*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*l
n(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+3*e*d^2/i/(a*d-b*c)^5/g^4*B*b^2/(b*e/d+e/(
d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-3*e*d^3/i/(a*d-
b*c)^5/g^4*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+3*e*d^2/i/(a*d-b*c)^5/
g^4*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c+3/2*e^2*d^2/i/(a*d-b*c)^5/g
^4*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+
c))*a-3/2*e^2*d/i/(a*d-b*c)^5/g^4*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)
^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+3/4*e^2*d^2/i/(a*d-b*c)^5/g^4*B*b^2/(b
*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a-3/4*e^2*d/i/(a*d-b*c)^5/g^4*B*b^3/(b*
e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c-1/3*e^3*d/i/(a*d-b*c)^5/g^4*B*b^3/(b*
e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+1/3*e^3
```

$$\frac{i/(a*d-b*c)^5/g^4*B*b^4/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-1/9*e^3*d/i/(a*d-b*c)^5/g^4*B*b^3/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^3*a+1/9*e^3/i/(a*d-b*c)^5/g^4*B*b^4/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^3*c$$

**Maxima [B]** time = 1.97217, size = 1983, normalized size = 5.32

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)^4/(d\*i\*x+c\*i),x, algorithm="maxima")

[Out] 
$$\begin{aligned} & -1/6*B*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^4*i*x^3 + 3*(a*b^5*c^3 - 3*a^2*b^4*c^2*d + 3*a^3*b^3*c*d^2 - a^4*b^2*d^3)*g^4*i*x^2 + 3*(a^2*b^4*c^3 - 3*a^3*b^3*c^2*d + 3*a^4*b^2*c*d^2 - a^5*b*d^3)*g^4*i*x + (a^3*b^3*c^3 - 3*a^4*b^2*c^2*d + 3*a^5*b*c*d^2 - a^6*d^3)*g^4*i) \\ & + 6*d^3*\log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^4*i) - 6*d^3*\log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^4*i))*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 1/6*A*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^4*i*x^3 + 3*(a*b^5*c^3 - 3*a^2*b^4*c^2*d + 3*a^3*b^3*c*d^2 - a^4*b^2*d^3)*g^4*i*x^2 + 3*(a^2*b^4*c^3 - 3*a^3*b^3*c^2*d + 3*a^4*b^2*c*d^2 - a^5*b*d^3)*g^4*i*x + (a^3*b^3*c^3 - 3*a^4*b^2*c^2*d + 3*a^5*b*c*d^2 - a^6*d^3)*g^4*i) + 6*d^3*\log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^4*i) - 6*d^3*\log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^4*i)) - 1/36*(4*b^3*c^3 - 27*a*b^2*c^2*d + 108*a^2*b*c*d^2 - 85*a^3*d^3 + 66*(b^3*c*d^2 - a*b^2*d^3)*x^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*\log(b*x + a)^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*\log(d*x + c)^2 - 3*(5*b^3*c^2*d - 54*a*b^2*c*d^2 + 49*a^2*b*d^3)*x + 66*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*\log(b*x + a) - 6*(11*b^3*d^3*x^3 + 33*a*b^2*d^3*x^2 + 33*a^2*b*d^3*x + 11*a^3*d^3 - 6*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*\log(b*x + a))*\log(d*x + c))*B/(a^3*b^4*c^4*g^4*i - 4*a^4*b^3*c^3*d*g^4*i + 6*a^5*b^2*c^2*d^2*g^4*i - 4*a^6*b*c*d^3*g^4*i + a^7*d^4*g^4*i + (b^7*c^4*g^4*i - 4*a*b^6*c^3*d*g^4*i + 6*a^2*b^5*c^2*d^2*g^4*i - 4*a^3*b^4*c*d^3*g^4*i + a^4*b^3*d^4*g^4*i)*x^3 + 3*(a*b^6*c^4*g^4*i - 4*a^2*b^5*c^3*d*g^4*i + 6*a^3*b^4*c^2*d^2*g^4*i - 4*a^4*b^3*c*d^3*g^4*i + a^5*b^2*d^4*g^4*i)*x^2 + 3*(a^2*b^5*c^4*g^4*i$$

$$i - 4a^3b^4c^3d^4g^{4i} + 6a^4b^3c^2d^2g^{4i} - 4a^5b^2c^3d^4g^{4i} + a^6b^4d^4g^{4i}) * x)$$

**Fricas [A]** time = 0.558678, size = 1285, normalized size = 3.45

$$\frac{4(3A + B)b^3c^3 - 27(2A + B)ab^2c^2d + 108(A + B)a^2bcd^2 - (66A + 85B)a^3d^3 + 6((6A + 11B)b^3cd^2 - (6A + 11B)a^3d^3)}{36((b^7c^4 - 4ab^6c^3d + 6a^2b^5c^2d^2 - 4a^3b^4c^2d^2 + a^4b^3c^2d^3 + a^5b^2c^2d^4)g^{4i} * x^3 + 3(a*b^6*c^4 - 4*a^2*b^5*c^3*d + 6*a^3*b^4*c^2*d^2 - 4*a^4*b^3*c*d^3 + a^5*b^2*d^4) * g^{4i} * x^2 + 3(a^2*b^5*c^4 - 4*a^3*b^4*c^3*d + 6*a^4*b^3*c^2*d^2 - 4*a^5*b^2*c*d^3 + a^6*b*d^4) * g^{4i} * x + (a^3*b^4*c^4 - 4*a^4*b^3*c^3*d + 6*a^5*b^2*c^2*d^2 - 4*a^6*b*c*d^3 + a^7*d^4) * g^{4i})}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)^4/(d\*i\*x+c\*i),x, algorithm="fricas")

[Out] 
$$\frac{-1/36*(4*(3*A + B)*b^3*c^3 - 27*(2*A + B)*a*b^2*c^2*d + 108*(A + B)*a^2*b*c*d^2 - (66*A + 85*B)*a^3*d^3 + 6*((6*A + 11*B)*b^3*c*d^2 - (6*A + 11*B)*a*b^2*d^3)*x^2 + 18*(B*b^3*d^3*x^3 + 3*B*a*b^2*d^3*x^2 + 3*B*a^2*b*d^3*x + B*a^3*d^3)*\log((b*e*x + a*e)/(d*x + c))^2 - 3*((6*A + 5*B)*b^3*c^2*d - 18*(2*A + 3*B)*a*b^2*c*d^2 + (30*A + 49*B)*a^2*b*d^3)*x + 6*((6*A + 11*B)*b^3*d^3*x^3 + 2*B*b^3*c^3 - 9*B*a*b^2*c^2*d + 18*B*a^2*b*c*d^2 + 6*A*a^3*d^3 + 3*(2*B*b^3*c*d^2 + 3*(2*A + 3*B)*a*b^2*d^3)*x^2 - 3*(B*b^3*c^2*d - 6*B*a*b^2*c*d^2 - 6*(A + B)*a^2*b*d^3)*x)*\log((b*e*x + a*e)/(d*x + c)))/(b^7*c^4 - 4*a*b^6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4*a^3*b^4*c^2*d^2 + a^4*b^3*c^2*d^3 + a^5*b^2*d^4) * g^{4i} * x^3 + 3(a*b^6*c^4 - 4*a^2*b^5*c^3*d + 6*a^3*b^4*c^2*d^2 - 4*a^4*b^3*c*d^3 + a^5*b^2*d^4) * g^{4i} * x^2 + 3(a^2*b^5*c^4 - 4*a^3*b^4*c^3*d + 6*a^4*b^3*c^2*d^2 - 4*a^5*b^2*c*d^3 + a^6*b*d^4) * g^{4i} * x + (a^3*b^4*c^4 - 4*a^4*b^3*c^3*d + 6*a^5*b^2*c^2*d^2 - 4*a^6*b*c*d^3 + a^7*d^4) * g^{4i}}$$

**Sympy [B]** time = 22.1794, size = 1392, normalized size = 3.73

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)\*\*4/(d\*i\*x+c\*i),x)

[Out] 
$$-B*d**3*\log(e*(a + b*x)/(c + d*x))**2/(2*a**4*d**4*g**4*i - 8*a**3*b*c*d**3 * g**4*i + 12*a**2*b**2*c**2*d**2*g**4*i - 8*a*b**3*c**3*d*g**4*i + 2*b**4*c**4*g**4*i) + d**3*(6*A + 11*B)*\log(x + (6*A*a*d**4 + 6*A*b*c*d**3 + 11*B*a$$

```

*d**4 + 11*B*b*c*d**3 - a**5*d**8*(6*A + 11*B)/(a*d - b*c)**4 + 5*a**4*b*c*
d**7*(6*A + 11*B)/(a*d - b*c)**4 - 10*a**3*b**2*c**2*d**6*(6*A + 11*B)/(a*d
- b*c)**4 + 10*a**2*b**3*c**3*d**5*(6*A + 11*B)/(a*d - b*c)**4 - 5*a*b**4*
c**4*d**4*(6*A + 11*B)/(a*d - b*c)**4 + b**5*c**5*d**3*(6*A + 11*B)/(a*d -
b*c)**4)/(12*A*b*d**4 + 22*B*b*d**4))/(6*g**4*i*(a*d - b*c)**4) - d**3*(6*A
+ 11*B)*log(x + (6*A*a*d**4 + 6*A*b*c*d**3 + 11*B*a*d**4 + 11*B*b*c*d**3 +
a**5*d**8*(6*A + 11*B)/(a*d - b*c)**4 - 5*a**4*b*c*d**7*(6*A + 11*B)/(a*d
- b*c)**4 + 10*a**3*b**2*c**2*d**6*(6*A + 11*B)/(a*d - b*c)**4 - 10*a**2*b*
**3*c**3*d**5*(6*A + 11*B)/(a*d - b*c)**4 + 5*a*b**4*c**4*d**4*(6*A + 11*B)/
(a*d - b*c)**4 - b**5*c**5*d**3*(6*A + 11*B)/(a*d - b*c)**4)/(12*A*b*d**4 +
22*B*b*d**4))/(6*g**4*i*(a*d - b*c)**4) + (11*B*a**2*d**2 - 7*B*a*b*c*d +
15*B*a*b*d**2*x + 2*B*b**2*c**2 - 3*B*b**2*c*d*x + 6*B*b**2*d**2*x**2)*log(
e*(a + b*x)/(c + d*x))/(6*a**6*d**3*g**4*i - 18*a**5*b*c*d**2*g**4*i + 18*a
**5*b*d**3*g**4*i*x + 18*a**4*b**2*c**2*d*g**4*i - 54*a**4*b**2*c*d**2*g**4
*i*x + 18*a**4*b**2*d**3*g**4*i*x**2 - 6*a**3*b**3*c**3*g**4*i + 54*a**3*b*
**3*c**2*d*g**4*i*x - 54*a**3*b**3*c*d**2*g**4*i*x**2 + 6*a**3*b**3*d**3*g**
4*i*x**3 - 18*a**2*b**4*c**3*g**4*i*x + 54*a**2*b**4*c**2*d*g**4*i*x**2 - 1
8*a**2*b**4*c*d**2*g**4*i*x**3 - 18*a*b**5*c**3*g**4*i*x**2 + 18*a*b**5*c**
2*d*g**4*i*x**3 - 6*b**6*c**3*g**4*i*x**3) + (66*A*a**2*d**2 - 42*A*a*b*c*d
+ 12*A*b**2*c**2 + 85*B*a**2*d**2 - 23*B*a*b*c*d + 4*B*b**2*c**2 + x**2*(3
6*A*b**2*d**2 + 66*B*b**2*d**2) + x*(90*A*a*b*d**2 - 18*A*b**2*c*d + 147*B*
a*b*d**2 - 15*B*b**2*c*d))/(36*a**6*d**3*g**4*i - 108*a**5*b*c*d**2*g**4*i
+ 108*a**4*b**2*c**2*d*g**4*i - 36*a**3*b**3*c**3*g**4*i + x**3*(36*a**3*b*
**3*d**3*g**4*i - 108*a**2*b**4*c*d**2*g**4*i + 108*a*b**5*c**2*d*g**4*i - 3
6*b**6*c**3*g**4*i) + x**2*(108*a**4*b**2*d**3*g**4*i - 324*a**3*b**3*c*d**
2*g**4*i + 324*a**2*b**4*c**2*d*g**4*i - 108*a*b**5*c**3*g**4*i) + x*(108*a
**5*b*d**3*g**4*i - 324*a**4*b**2*c*d**2*g**4*i + 324*a**3*b**3*c**2*d*g**4
*i - 108*a**2*b**4*c**3*g**4*i))

```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{B \log\left(\frac{(bx+a)e}{dx+c}\right) + A}{(bgx + ag)^4 (dix + ci)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)^4/(d\*i\*x+c\*i),x, algorithm="giac")

[Out] integrate((B\*log((b\*x + a)\*e/(d\*x + c)) + A)/((b\*g\*x + a\*g)^4\*(d\*i\*x + c\*i)), x)



$$3.39 \quad \int \frac{(ag+bgx)^3 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{(ci+dix)^2} dx$$

**Optimal.** Leaf size=341

$$\frac{3bBg^3(bc-ad)^2 \text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)}{d^4 i^2} - \frac{g^3(a+bx)^2(bc-ad) \left( 3B \log\left(\frac{e(a+bx)}{c+dx}\right) + 3A + B \right)}{2d^2 i^2(c+dx)} - \frac{bg^3(bc-ad)^2 \log\left(\frac{bc-ad}{b(c+dx)}\right)}{2}$$

[Out]  $(3*B*(b*c - a*d)^2*g^3*(a + b*x))/(d^3*i^2*(c + d*x)) - ((6*A + 5*B)*(b*c - a*d)^2*g^3*(a + b*x))/(2*d^3*i^2*(c + d*x)) - (3*B*(b*c - a*d)^2*g^3*(a + b*x)*\text{Log}[(e*(a + b*x))/(c + d*x)]/(d^3*i^2*(c + d*x)) + (g^3*(a + b*x)^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(2*d*i^2*(c + d*x)) - ((b*c - a*d)*g^3*(a + b*x)^2*(3*A + B + 3*B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(2*d^2*i^2*(c + d*x)) - (b*(b*c - a*d)^2*g^3*\text{Log}[(b*c - a*d)/(b*(c + d*x))]*(6*A + 5*B + 6*B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(2*d^4*i^2) - (3*b*B*(b*c - a*d)^2*g^3*\text{PolyLog}[2, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i^2)$

**Rubi [A]** time = 0.727061, antiderivative size = 519, normalized size of antiderivative = 1.52, number of steps used = 22, number of rules used = 14, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.35$ , Rules used = {2528, 2486, 31, 2525, 12, 72, 44, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{3bBg^3(bc-ad)^2 \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{d^4 i^2} - \frac{a^2 b B g^3 \log(a+bx)}{2d^2 i^2} + \frac{b^3 g^3 x^2 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{2d^2 i^2} - \frac{Ab^2 g^3 x(2bc-3ad)}{d^3 i^2} + \frac{g^3}{2}$$

Antiderivative was successfully verified.

[In] Int[((a\*g + b\*g\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(c\*i + d\*i\*x)^2, x]

[Out]  $-((A*b^2*(2*b*c - 3*a*d)*g^3*x)/(d^3*i^2)) - (b^2*B*(b*c - a*d)*g^3*x)/(2*d^3*i^2) - (B*(b*c - a*d)^3*g^3)/(d^4*i^2*(c + d*x)) - (a^2*b*B*g^3*\text{Log}[a + b*x])/(2*d^2*i^2) - (b*B*(b*c - a*d)^2*g^3*\text{Log}[a + b*x])/(d^4*i^2) - (b*B*(2*b*c - 3*a*d)*g^3*(a + b*x)*\text{Log}[(e*(a + b*x))/(c + d*x)]/(d^3*i^2) + (b^3*g^3*x^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(2*d^2*i^2) + ((b*c - a*d)^3*g^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(d^4*i^2*(c + d*x)) + (b^3*B*c^2*g^3*\text{Log}[c + d*x])/(2*d^4*i^2) + (b*B*(2*b*c - 3*a*d)*(b*c - a*d)*g^3*\text{Log}[c + d*x])/(d^4*i^2) + (b*B*(b*c - a*d)^2*g^3*\text{Log}[c + d*x])/(d^4*i^2) - (3*b*B*(b*c - a*d)^2*g^3*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/(d^4*i^2) + (3*b*(b*c - a*d)^2*g^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])*\text{Log}[c + d*x])/(d^4*i^2)$

$x])/d^{4i^2} + (3bB(b^2c - a^2d)^2g^3 \text{Log}[c + dx]^2)/(2d^{4i^2}) - (3b$   
 $B(b^2c - a^2d)^2g^3 \text{PolyLog}[2, (b(c + dx))/(b^2c - a^2d)]/d^{4i^2}$

### Rule 2528

`Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With`  
`[[u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x]], Int[u, x] /; SumQ[u`  
`]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunc`  
`tionQ[RGx, x] && IGtQ[n, 0]`

### Rule 2486

`Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.)`  
`^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)`  
`^q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +`  
`d*x)^q]^r]^s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s`  
`}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]`

### Rule 31

`Int[((a_) + (b_.)*(x_))^(n_), x_Symbol] := Simp[Log[RemoveContent[a + b*x,`  
`x]]/b, x] /; FreeQ[{a, b}, x]`

### Rule 2525

`Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.`  
`), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1))`  
`, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(`  
`a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x], x] /; FreeQ[{a, b, c, d`  
`, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||`  
`IntegerQ[m]) && NeQ[m, -1]`

### Rule 12

`Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match`  
`Q[u, (b_)*(v_)] /; FreeQ[b, x]`

### Rule 72

`Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),`  
`x_Symbol] := Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]`  
`/; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]`

### Rule 44

```
Int[((a_) + (b_)*(x_)^(m_))*((c_) + (d_)*(x_)^(n_)), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

#### Rule 2524

```
Int[((a_) + Log[(c_)*(RFX_)^(p_)])*(b_)^(n_)/((d_) + (e_)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFX^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0]
```

#### Rule 2418

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_)^(n_))])*(b_)^(p_)*(RFX_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFX, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFX, x] && IntegerQ[p]
```

#### Rule 2394

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_)^(n_))])*(b_)/((f_) + (g_)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

#### Rule 2393

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_))])*(b_)/((f_) + (g_)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

#### Rule 2391

```
Int[Log[(c_)*((d_) + (e_)*(x_)^(n_))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

#### Rule 2390

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_)^(n_))])*(b_)^(p_)*((f_) + (g_
)*(x_)^(q_)), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] :> Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

Rubi steps

$$\begin{aligned}
 \int \frac{(ag + bgx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{(39c + 39dx)^2} dx &= \int \left( -\frac{b^2(2bc - 3ad)g^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{1521d^3} + \frac{b^3g^3x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{1521d^2} + \dots \right) dx \\
 &= \frac{(b^3g^3) \int x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) dx}{1521d^2} - \frac{(b^2(2bc - 3ad)g^3) \int \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) dx}{1521d^3} \\
 &= -\frac{Ab^2(2bc - 3ad)g^3x}{1521d^3} + \frac{b^3g^3x^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{3042d^2} + \frac{(bc - ad)^3g^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{1521d^4(c + dx)} \\
 &= -\frac{Ab^2(2bc - 3ad)g^3x}{1521d^3} - \frac{bB(2bc - 3ad)g^3(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{1521d^3} + \frac{b^3g^3x^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{3042d^2} \\
 &= -\frac{Ab^2(2bc - 3ad)g^3x}{1521d^3} - \frac{bB(2bc - 3ad)g^3(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{1521d^3} + \frac{b^3g^3x^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{3042d^2} \\
 &= -\frac{Ab^2(2bc - 3ad)g^3x}{1521d^3} - \frac{b^2B(bc - ad)g^3x}{3042d^3} - \frac{B(bc - ad)^3g^3}{1521d^4(c + dx)} - \frac{a^2bBg^3 \log(a + bx)}{3042d^2} \\
 &= -\frac{Ab^2(2bc - 3ad)g^3x}{1521d^3} - \frac{b^2B(bc - ad)g^3x}{3042d^3} - \frac{B(bc - ad)^3g^3}{1521d^4(c + dx)} - \frac{a^2bBg^3 \log(a + bx)}{3042d^2} \\
 &= -\frac{Ab^2(2bc - 3ad)g^3x}{1521d^3} - \frac{b^2B(bc - ad)g^3x}{3042d^3} - \frac{B(bc - ad)^3g^3}{1521d^4(c + dx)} - \frac{a^2bBg^3 \log(a + bx)}{3042d^2} \\
 &= -\frac{Ab^2(2bc - 3ad)g^3x}{1521d^3} - \frac{b^2B(bc - ad)g^3x}{3042d^3} - \frac{B(bc - ad)^3g^3}{1521d^4(c + dx)} - \frac{a^2bBg^3 \log(a + bx)}{3042d^2}
 \end{aligned}$$

**Mathematica [A]** time = 0.42726, size = 359, normalized size = 1.05

$$g^3 \left( -3bB(bc - ad)^2 \left( 2 \operatorname{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right) + \log(c + dx) \left( 2 \log \left( \frac{d(a+bx)}{ad-bc} \right) - \log(c + dx) \right) \right) + bB \left( b(dx(ad - bc) + bc^2 \log(c + dx)) \right) \right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c*i + d*i*x)^2,x]
```

```
[Out] (g^3*(-2*A*b^2*d*(2*b*c - 3*a*d)*x - 2*b*B*d*(2*b*c - 3*a*d)*(a + b*x)*Log[
(e*(a + b*x))/(c + d*x)] + b^3*d^2*x^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])
+ (2*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c + d*x) + 2*b*B
*(2*b*c - 3*a*d)*(b*c - a*d)*Log[c + d*x] + 6*b*(b*c - a*d)^2*(A + B*Log[(e
*(a + b*x))/(c + d*x)])*Log[c + d*x] - 2*B*(b*c - a*d)^2*((b*c - a*d)/(c +
d*x) + b*Log[a + b*x] - b*Log[c + d*x]) + b*B*(-(a^2*d^2*Log[a + b*x]) + b*
(d*(-(b*c) + a*d)*x + b*c^2*Log[c + d*x])) - 3*b*B*(b*c - a*d)^2*((2*Log[(d
*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*
(c + d*x))/(b*c - a*d)])))/(2*d^4*i^2)
```

---

**Maple [B]** time = 0.174, size = 2973, normalized size = 8.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^2,x)
```

```
[Out] -1/d*A*g^3/i^2*a^3/(d*x+c)+1/d*B*g^3/i^2*a^3/(d*x+c)-1/d^2*A*g^3/i^2*a^2*b+
1/d^4*B*g^3/i^2*b^3*c^2+2*e^2/d^3*B*g^3/i^2*b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x
+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a/(d*x+c)^2*c^3-3*e^2/d^2*B*g^3/i^2*b^
3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2/(d*x+
c)^2*c^2-9*e/d^2*B*g^3/i^2*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)
*a-e/(d*x+c)*b*c)*c/(d*x+c)*a^2+9*e/d^3*B*g^3/i^2*b^3*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^2/(d*x+c)*a+2*e^2/d*B*g^3/i^2*b^
2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3/(d*x+
c)^2*c-3*e/d^4*B*g^3/i^2*b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a
-e/(d*x+c)*b*c)*c^3/(d*x+c)+3*e/d*B*g^3/i^2*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c
))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^3/(d*x+c)-1/2*e^2/d^4*B*g^3/i^2*b^5*ln(b
*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^4/(d*x+c)^2-6
*e/d^3*B*g^3/i^2*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+
c)*b*c)*c*a-e^2/d^3*B*g^3/i^2*b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x
+c)*a-e/(d*x+c)*b*c)^2*c*a-3/d^2*B*g^3/i^2*b*dilog(-(d*(b*e/d+(a*d-b*c)*e/d
/(d*x+c))-b*e)/b/e)*a^2+1/d^4*A*g^3/i^2*b^3*c^3/(d*x+c)-1/d^4*B*g^3/i^2*b^3
*c^3/(d*x+c)-3/d^4*B*g^3/i^2*b^3*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*
e)/b/e)*c^2-5/2/d^2*B*g^3/i^2*b*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^2
-5/2/d^4*B*g^3/i^2*b^3*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c^2-3/d^2*A*
```

$$\begin{aligned}
& g^3/i^2*b*\ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^2-1/d^4*B*g^3/i^2*\ln(b* \\
& e/d+(a*d-b*c)*e/d/(d*x+c))*b^3*c^2-1/d^2*B*g^3/i^2*\ln(b*e/d+(a*d-b*c)*e/d/( \\
& d*x+c))*a^2*b-1/d*B*g^3/i^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a^3/(d*x+c)-3/d \\
& ^4*A*g^3/i^2*b^3*\ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c^2-1/d^4*A*g^3/i^ \\
& 2*b^3*c^2-3/d^2*B*g^3/i^2*a^2/(d*x+c)*b*c+3/d^3*B*g^3/i^2*b^2*c^2/(d*x+c)*a \\
& +1/d^4*B*g^3/i^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3*c^3/(d*x+c)-3/d^2*B*g^ \\
& 3/i^2*b*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*\ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c) \\
& )-b*e)/b/e)*a^2+2/d^3*A*g^3/i^2*a*b^2*c-2/d^3*B*g^3/i^2*b^2*c*a+3*e/d^4*A*g \\
& ^3/i^2*b^4/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^2+1/2*e/d^2*B*g^3/i^2*b^2/(d*e/( \\
& d*x+c)*a-e/(d*x+c)*b*c)*a^2+1/2*e/d^4*B*g^3/i^2*b^4/(d*e/(d*x+c)*a-e/(d*x+c \\
& )*b*c)*c^2+6/d^3*B*g^3/i^2*b^2*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e) \\
& /b/e)*a*c-3/d^3*A*g^3/i^2*a/(d*x+c)*b^2*c^2+5/d^3*B*g^3/i^2*b^2*\ln(d*(b*e/d \\
& +(a*d-b*c)*e/d/(d*x+c))-b*e)*a*c+1/2*e^2/d^2*A*g^3/i^2*b^3/(d*e/(d*x+c)*a-e \\
& /d*x+c)*b*c)^2*a^2+1/2*e^2/d^4*A*g^3/i^2*b^5/(d*e/(d*x+c)*a-e/(d*x+c)*b*c) \\
& ^2*c^2+3*e/d^2*A*g^3/i^2*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2-3/d^4*B*g^3/ \\
& i^2*b^3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*\ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c) \\
& )-b*e)/b/e)*c^2+2/d^3*B*g^3/i^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*c*a+6/d \\
& ^3*A*g^3/i^2*b^2*\ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c*a+3/d^2*A*g^3/i^ \\
& 2*a^2/(d*x+c)*b*c+1/d^2*B*g^3/i^2*b*a^2-6*e/d^3*A*g^3/i^2*b^3/(d*e/(d*x+c)* \\
& a-e/(d*x+c)*b*c)*a*c-e/d^3*B*g^3/i^2*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a*c- \\
& e^2/d^3*A*g^3/i^2*b^4/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a*c-1/2*e^2*B*g^3/i^2 \\
& *b*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^4/(d*x \\
& +c)^2+6/d^3*B*g^3/i^2*b^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*\ln(-(d*(b*e/d+(a* \\
& d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a*c-3/d^3*B*g^3/i^2*\ln(b*e/d+(a*d-b*c)*e/d/(d \\
& *x+c))*b^2*c^2/(d*x+c)*a+3/d^2*B*g^3/i^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b* \\
& c/(d*x+c)*a^2+3*e/d^4*B*g^3/i^2*b^4*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d \\
& *x+c)*a-e/(d*x+c)*b*c)*c^2+3*e/d^2*B*g^3/i^2*b^2*\ln(b*e/d+(a*d-b*c)*e/d/(d* \\
& x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2+1/2*e^2/d^4*B*g^3/i^2*b^5*\ln(b*e/d+ \\
& (a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^2+1/2*e^2/d^2*B*g^ \\
& 3/i^2*b^3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a \\
& ^2
\end{aligned}$$


---

**Maxima [B]** time = 1.5938, size = 1810, normalized size = 5.31

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(d\*i\*x+c\*i)^2,x, algorithm="maxima")

[Out] 1/2\*(2\*c^3/(d^5\*i^2\*x + c\*d^4\*i^2) + 6\*c^2\*log(d\*x + c)/(d^4\*i^2) + (d\*x^2 - 4\*c\*x)/(d^3\*i^2))\*A\*b^3\*g^3 - 3\*A\*a\*b^2\*(c^2/(d^4\*i^2\*x + c\*d^3\*i^2) - x/

$$\begin{aligned}
& (d^2i^2) + 2c \log(dx + c)/(d^3i^2) * g^3 + 3Aa^2b * g^3 * (c/(d^3i^2 * x + \\
& c * d^2i^2) + \log(dx + c)/(d^2i^2)) - Ba^3 * g^3 * (\log(b * e * x / (dx + c) + a * \\
& e / (dx + c)) / (d^2i^2 * x + c * d * i^2) - 1 / (d^2i^2 * x + c * d * i^2) - b * \log(b * x + \\
& a) / ((b * c * d - a * d^2) * i^2) + b * \log(dx + c) / ((b * c * d - a * d^2) * i^2)) - A * a^3 * g^3 \\
& / (d^2i^2 * x + c * d * i^2) - 1/2 * (6 * a^3 * b * d^3 * g^3 * \log(e) - (6 * g^3 * \log(e) + 7 * g^3 \\
& ^3) * b^4 * c^3 + (18 * g^3 * \log(e) + 17 * g^3) * a * b^3 * c^2 * d - 6 * (3 * g^3 * \log(e) + 2 * g^3 \\
& ^3) * a^2 * b^2 * c * d^2) * B * \log(dx + c) / (b * c * d^4 * i^2 - a * d^5 * i^2) + 1/2 * ((b^4 * c * d^3 \\
& * g^3 * \log(e) - a * b^3 * d^4 * g^3 * \log(e)) * B * x^3 - ((3 * g^3 * \log(e) + g^3) * b^4 * c^2 * \\
& d^2 - (9 * g^3 * \log(e) + 2 * g^3) * a * b^3 * c * d^3 + (6 * g^3 * \log(e) + g^3) * a^2 * b^2 * d^4 \\
& ) * B * x^2 - ((4 * g^3 * \log(e) + g^3) * b^4 * c^3 * d - 2 * (5 * g^3 * \log(e) + g^3) * a * b^3 * c^2 \\
& * d^2 + (6 * g^3 * \log(e) + g^3) * a^2 * b^2 * c * d^3) * B * x - 3 * ((b^4 * c^3 * d * g^3 - 3 * a * b^3 \\
& * c^2 * d^2 * g^3 + 3 * a^2 * b^2 * c * d^3 * g^3 - a^3 * b * d^4 * g^3) * B * x + (b^4 * c^4 * g^3 - \\
& 3 * a * b^3 * c^3 * d * g^3 + 3 * a^2 * b^2 * c^2 * d^2 * g^3 - a^3 * b * c * d^3 * g^3) * B) * \log(dx + c) \\
& )^2 + 2 * ((g^3 * \log(e) - g^3) * b^4 * c^4 - 4 * (g^3 * \log(e) - g^3) * a * b^3 * c^3 * d + 6 * \\
& (g^3 * \log(e) - g^3) * a^2 * b^2 * c^2 * d^2 - 3 * (g^3 * \log(e) - g^3) * a^3 * b * c * d^3) * B + \\
& ((b^4 * c * d^3 * g^3 - a * b^3 * d^4 * g^3) * B * x^3 - 3 * (b^4 * c^2 * d^2 * g^3 - 3 * a * b^3 * c * d^3 \\
& * g^3 + 2 * a^2 * b^2 * d^4 * g^3) * B * x^2 - (6 * b^4 * c^3 * d * g^3 - 12 * a * b^3 * c^2 * d^2 * g^3 + \\
& 3 * a^2 * b^2 * c * d^3 * g^3 + 5 * a^3 * b * d^4 * g^3) * B * x - (6 * a * b^3 * c^3 * d * g^3 - 15 * a^2 * b \\
& ^2 * c^2 * d^2 * g^3 + 11 * a^3 * b * c * d^3 * g^3) * B) * \log(b * x + a) - ((b^4 * c * d^3 * g^3 - a * \\
& b^3 * d^4 * g^3) * B * x^3 - 3 * (b^4 * c^2 * d^2 * g^3 - 3 * a * b^3 * c * d^3 * g^3 + 2 * a^2 * b^2 * d^4 \\
& * g^3) * B * x^2 - 2 * (2 * b^4 * c^3 * d * g^3 - 5 * a * b^3 * c^2 * d^2 * g^3 + 3 * a^2 * b^2 * c * d^3 * g^3 \\
& ^3) * B * x + 2 * (b^4 * c^4 * g^3 - 4 * a * b^3 * c^3 * d * g^3 + 6 * a^2 * b^2 * c^2 * d^2 * g^3 - 3 * a^3 \\
& * b * c * d^3 * g^3) * B) * \log(dx + c)) / (b * c^2 * d^4 * i^2 - a * c * d^5 * i^2 + (b * c * d^5 * i^2 \\
& - a * d^6 * i^2) * x) + 3 * (b^3 * c^2 * g^3 - 2 * a * b^2 * c * d * g^3 + a^2 * b * d^2 * g^3) * (\log(b * \\
& x + a) * \log((b * d * x + a * d) / (b * c - a * d) + 1) + \operatorname{dilog}(-(b * d * x + a * d) / (b * c - a * d) \\
& ))) * B / (d^4 * i^2)
\end{aligned}$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\operatorname{integral} \left( \frac{Ab^3g^3x^3 + 3Aab^2g^3x^2 + 3Aa^2bg^3x + Aa^3g^3 + (Bb^3g^3x^3 + 3Bab^2g^3x^2 + 3Ba^2bg^3x + Ba^3g^3) \log\left(\frac{bex+ae}{dx+c}\right)}{d^2i^2x^2 + 2cdi^2x + c^2i^2}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(d\*i\*x+c\*i)^2,x, algorith="fricas")

[Out] integral((A\*b^3\*g^3\*x^3 + 3\*A\*a\*b^2\*g^3\*x^2 + 3\*A\*a^2\*b\*g^3\*x + A\*a^3\*g^3 + (B\*b^3\*g^3\*x^3 + 3\*B\*a\*b^2\*g^3\*x^2 + 3\*B\*a^2\*b\*g^3\*x + B\*a^3\*g^3)\*log((b\*e\*x + a\*e)/(d\*x + c)))/(d^2\*i^2\*x^2 + 2\*c\*d\*i^2\*x + c^2\*i^2), x)

---

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*\*3\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))/(d\*i\*x+c\*i)\*\*2,x)

[Out] Timed out

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^3 \left( B \log \left( \frac{(bx+a)e}{dx+c} \right) + A \right)}{(dix + ci)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(d\*i\*x+c\*i)^2,x, algorithm="giac")

[Out] integrate((b\*g\*x + a\*g)^3\*(B\*log((b\*x + a)\*e/(d\*x + c)) + A)/(d\*i\*x + c\*i)^2, x)



$$3.40 \quad \int \frac{(ag+bgx)^2 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{(ci+dx)^2} dx$$

**Optimal.** Leaf size=260

$$\frac{2bBg^2(bc-ad)\text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)}{d^3i^2} + \frac{bg^2(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(2B\log\left(\frac{e(a+bx)}{c+dx}\right) + 2A + B\right)}{d^3i^2} + \frac{g^2(2A+B)(a+bx)(bc-ad)}{d^2i^2(c+dx)}$$

[Out]  $(-2*B*(b*c - a*d)*g^2*(a + b*x))/(d^2*i^2*(c + d*x)) + ((2*A + B)*(b*c - a*d)*g^2*(a + b*x))/(d^2*i^2*(c + d*x)) + (2*B*(b*c - a*d)*g^2*(a + b*x)*\text{Log}[(e*(a + b*x))/(c + d*x)])/(d^2*i^2*(c + d*x)) + (g^2*(a + b*x)^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(d*i^2*(c + d*x)) + (b*(b*c - a*d)*g^2*\text{Log}[(b*c - a*d)/(b*(c + d*x))]*(2*A + B + 2*B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(d^3*i^2) + (2*b*B*(b*c - a*d)*g^2*\text{PolyLog}[2, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i^2)$

**Rubi [A]** time = 0.532412, antiderivative size = 336, normalized size of antiderivative = 1.29, number of steps used = 18, number of rules used = 13, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.325$ , Rules used = {2528, 2486, 31, 2525, 12, 44, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{2bBg^2(bc-ad)\text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{d^3i^2} - \frac{g^2(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{d^3i^2(c+dx)} - \frac{2bg^2(bc-ad)\log(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{d^3i^2}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[\frac{(a*g + b*g*x)^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])}{(c*i + d*i*x)^2}, x]$

[Out]  $(A*b^2*g^2*x)/(d^2*i^2) + (B*(b*c - a*d)^2*g^2)/(d^3*i^2*(c + d*x)) + (b*B*(b*c - a*d)*g^2*\text{Log}[a + b*x])/(d^3*i^2) + (b*B*g^2*(a + b*x)*\text{Log}[(e*(a + b*x))/(c + d*x)])/(d^2*i^2) - ((b*c - a*d)^2*g^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(d^3*i^2*(c + d*x)) - (2*b*B*(b*c - a*d)*g^2*\text{Log}[c + d*x])/(d^3*i^2) + (2*b*B*(b*c - a*d)*g^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/(d^3*i^2) - (2*b*(b*c - a*d)*g^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])*\text{Log}[c + d*x])/(d^3*i^2) - (b*B*(b*c - a*d)*g^2*\text{Log}[c + d*x]^2)/(d^3*i^2) + (2*b*B*(b*c - a*d)*g^2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]/(d^3*i^2)$

**Rule 2528**

$\text{Int}[(a_.) + \text{Log}[(c_.)*(RFx_)^(p_.)]*(b_.)^(n_.)*(RGx_), x\_Symbol] \rightarrow \text{With}[\{u = \text{ExpandIntegrand}[(a + b*\text{Log}[c*RFx^p])^n, RGx, x]\}, \text{Int}[u, x] /; \text{SumQ}[u$

```
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.))^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

### Rule 31

```
Int[((a_) + (b_.)*(x_))^(n_), x_Symbol] := Simp[Log[RemoveContent[a + b*x, x]]/b, x] /; FreeQ[{a, b}, x]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol]
:> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n]^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)),
x_Symbol]
:> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n]))/g, x] -
Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /;
FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)),
x_Symbol]
:> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /;
FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]/(x_), x_Symbol]
:> -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_.)*(x_))^(q_.),
x_Symbol]
:> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /;
FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_))^(n_.)]*(b_.)/(x_), x_Symbol]
:> Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{(ag + bgx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{(40c + 40dx)^2} dx &= \int \left( \frac{b^2 g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{1600d^2} + \frac{(-bc + ad)^2 g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{1600d^2(c + dx)^2} - \frac{b(bc - ad)^2 g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{1600d^2(c + dx)^2} \right) dx \\
&= \frac{(b^2 g^2) \int \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) dx}{1600d^2} - \frac{(b(bc - ad)g^2) \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{c+dx} dx}{800d^2} + \frac{(bc - ad)^2 g^2 \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{c+dx} dx}{800d^3} \\
&= \frac{Ab^2 g^2 x}{1600d^2} - \frac{(bc - ad)^2 g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{1600d^3(c + dx)} - \frac{b(bc - ad)g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{800d^3} \\
&= \frac{Ab^2 g^2 x}{1600d^2} + \frac{bB g^2 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{1600d^2} - \frac{(bc - ad)^2 g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{1600d^3(c + dx)} - \frac{b(bc - ad)g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{800d^3} \\
&= \frac{Ab^2 g^2 x}{1600d^2} + \frac{bB g^2 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{1600d^2} - \frac{(bc - ad)^2 g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{1600d^3(c + dx)} - \frac{b(bc - ad)g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{800d^3} \\
&= \frac{Ab^2 g^2 x}{1600d^2} + \frac{B(bc - ad)^2 g^2}{1600d^3(c + dx)} + \frac{bB(bc - ad)g^2 \log(a + bx)}{1600d^3} + \frac{bB g^2 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{1600d^2} \\
&= \frac{Ab^2 g^2 x}{1600d^2} + \frac{B(bc - ad)^2 g^2}{1600d^3(c + dx)} + \frac{bB(bc - ad)g^2 \log(a + bx)}{1600d^3} + \frac{bB g^2 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{1600d^2} \\
&= \frac{Ab^2 g^2 x}{1600d^2} + \frac{B(bc - ad)^2 g^2}{1600d^3(c + dx)} + \frac{bB(bc - ad)g^2 \log(a + bx)}{1600d^3} + \frac{bB g^2 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{1600d^2} \\
&= \frac{Ab^2 g^2 x}{1600d^2} + \frac{B(bc - ad)^2 g^2}{1600d^3(c + dx)} + \frac{bB(bc - ad)g^2 \log(a + bx)}{1600d^3} + \frac{bB g^2 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{1600d^2}
\end{aligned}$$

**Mathematica [A]** time = 0.244676, size = 239, normalized size = 0.92

$$g^2 \left( bB(bc - ad) \left( 2 \text{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right) + \log(c + dx) \left( 2 \log \left( \frac{d(a+bx)}{ad-bc} \right) - \log(c + dx) \right) \right) - 2b(bc - ad) \log(c + dx) \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) \right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x])))/(c*i + d*i*x)^2, x]
```

```
[Out] (g^2*(A*b^2*d*x + (B*(b*c - a*d)^2)/(c + d*x) + b*B*(b*c - a*d)*Log[a + b*x]
+ b*B*d*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] - ((b*c - a*d)^2*(A + B*Log
g[(e*(a + b*x))/(c + d*x)]))/(c + d*x) - 2*b*B*(b*c - a*d)*Log[c + d*x] - 2
*b*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + b*B*(b*c
- a*d)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x]
+ 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(d^3*i^2)
```

**Maple [B]** time = 0.171, size = 1382, normalized size = 5.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^2,x)
```

```
[Out] e/d*g^2/i^2*B*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*
c)/(d*x+c)*a^2+2/d^2*g^2/i^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*a*b*
c-1/d*g^2/i^2*A/(d*x+c)*a^2+1/d*g^2/i^2*B/(d*x+c)*a^2+e/d^3*g^2/i^2*B*b^3*ln
(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)/(d*x+c)*c^2+2/
d^3*g^2/i^2*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e
/d/(d*x+c))-b*e)/b/e)*c-1/d^3*g^2/i^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*
x+c)*b^2*c^2-2/d^2*g^2/i^2*B*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/
d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a+e/d^2*g^2/i^2*A*b^2/(d*e/(d*x+c)*a-e/(
d*x+c)*b*c)*a-e/d^3*g^2/i^2*A*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c+2/d^2*g^2
/i^2*A/(d*x+c)*a*b*c-2/d^2*g^2/i^2*B/(d*x+c)*a*b*c-2*e/d^2*g^2/i^2*B*b^2*ln
(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)/(d*x+c)*a*c-e/d
^3*g^2/i^2*B*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b
*c)*c+e/d^2*g^2/i^2*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/
(d*x+c)*b*c)*a+1/d^3*g^2/i^2*B/(d*x+c)*b^2*c^2-1/d^2*g^2/i^2*A*b*a+1/d^3*g^
2/i^2*A*b^2*c+1/d^2*g^2/i^2*B*b*a-1/d^3*g^2/i^2*B*b^2*c+1/d^3*g^2/i^2*B*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*c-1/d^3*g^2/i^2*A/(d*x+c)*b^2*c^2+2/d^3*g^
2/i^2*A*b^2*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c-2/d^2*g^2/i^2*A*b*ln(
d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a-1/d^2*g^2/i^2*B*b*ln(d*(b*e/d+(a*d-b
*c)*e/d/(d*x+c))-b*e)*a+1/d^3*g^2/i^2*B*b^2*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+
c))-b*e)*c+2/d^3*g^2/i^2*B*b^2*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)
/b/e)*c-1/d*g^2/i^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*a^2-1/d^2*g^2
/i^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*a-2/d^2*g^2/i^2*B*b*dilog(-(d*(b*e
/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a
```

**Maxima [B]** time = 1.53016, size = 1196, normalized size = 4.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^2,x, algorithm="maxima")
```

```
[Out] -A*b^2*(c^2/(d^4*i^2*x + c*d^3*i^2) - x/(d^2*i^2) + 2*c*log(d*x + c)/(d^3*i^2))*g^2 + 2*A*a*b*g^2*(c/(d^3*i^2*x + c*d^2*i^2) + log(d*x + c)/(d^2*i^2)) - B*a^2*g^2*(log(b*e*x/(d*x + c) + a*e/(d*x + c))/(d^2*i^2*x + c*d*i^2) - 1/(d^2*i^2*x + c*d*i^2) - b*log(b*x + a)/((b*c*d - a*d^2)*i^2) + b*log(d*x + c)/((b*c*d - a*d^2)*i^2)) - A*a^2*g^2/(d^2*i^2*x + c*d*i^2) - (2*a^2*b*d^2*g^2*log(e) + 2*(g^2*log(e) + g^2)*b^3*c^2 - (4*g^2*log(e) + 3*g^2)*a*b^2*c*d)*B*log(d*x + c)/(b*c*d^3*i^2 - a*d^4*i^2) + ((b^3*c*d^2*g^2*log(e) - a*b^2*d^3*g^2*log(e))*B*x^2 + (b^3*c^2*d*g^2*log(e) - a*b^2*c*d^2*g^2*log(e))*B*x + ((b^3*c^2*d*g^2 - 2*a*b^2*c*d^2*g^2 + a^2*b*d^3*g^2)*B*x + (b^3*c^3*g^2 - 2*a*b^2*c^2*d*g^2 + a^2*b*c*d^2*g^2)*B)*log(d*x + c)^2 - ((g^2*log(e) - g^2)*b^3*c^3 - 3*(g^2*log(e) - g^2)*a*b^2*c^2*d + 2*(g^2*log(e) - g^2)*a^2*b*c*d^2)*B + ((b^3*c*d^2*g^2 - a*b^2*d^3*g^2)*B*x^2 + (2*b^3*c^2*d*g^2 - 2*a*b^2*c*d^2*g^2 - a^2*b*d^3*g^2)*B*x + (2*a*b^2*c^2*d*g^2 - 3*a^2*b*c*d^2*g^2)*B)*log(b*x + a) - ((b^3*c*d^2*g^2 - a*b^2*d^3*g^2)*B*x^2 + (b^3*c^2*d*g^2 - a*b^2*c*d^2*g^2)*B*x - (b^3*c^3*g^2 - 3*a*b^2*c^2*d*g^2 + 2*a^2*b*c*d^2*g^2)*B)*log(d*x + c))/(b*c^2*d^3*i^2 - a*c*d^4*i^2 + (b*c*d^4*i^2 - a*d^5*i^2)*x) - 2*(b^2*c*g^2 - a*b*d*g^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B/(d^3*i^2)
```

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{Ab^2g^2x^2 + 2Aabg^2x + Aa^2g^2 + (Bb^2g^2x^2 + 2Babg^2x + Ba^2g^2) \log\left(\frac{bex+ae}{dx+c}\right)}{d^2i^2x^2 + 2cdi^2x + c^2i^2}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^2,x, algorithm="fricas")
```

```
[Out] integral((A*b^2*g^2*x^2 + 2*A*a*b*g^2*x + A*a^2*g^2 + (B*b^2*g^2*x^2 + 2*B*a*b*g^2*x + B*a^2*g^2)*log((b*e*x + a*e)/(d*x + c)))/(d^2*i^2*x^2 + 2*c*d*i
```

$^2*x + c^2*i^2), x)$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*\*2\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))/(d\*i\*x+c\*i)\*\*2,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^2 \left( B \log\left(\frac{(bx+a)e}{dx+c}\right) + A \right)}{(dix + ci)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(d\*i\*x+c\*i)^2,x, algorithm="giac")

[Out] integrate((b\*g\*x + a\*g)^2\*(B\*log((b\*x + a)\*e/(d\*x + c)) + A)/(d\*i\*x + c\*i)^2, x)

$$3.41 \quad \int \frac{(ag+bgx)\left(A+B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ci+dix)^2} dx$$

**Optimal.** Leaf size=160

$$\frac{bBgPolyLog\left(2, \frac{d(a+bx)}{b(c+dx)}\right)}{d^2i^2} - \frac{bg \log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{d^2i^2} - \frac{Ag(a+bx)}{di^2(c+dx)} - \frac{Bg(a+bx) \log\left(\frac{e(a+bx)}{c+dx}\right)}{di^2(c+dx)} + \frac{Bg(a+bx)}{di^2(c+dx)}$$

[Out]  $-\left(\frac{A * g * (a + b * x)}{d * i^2 * (c + d * x)}\right) + \left(\frac{B * g * (a + b * x)}{d * i^2 * (c + d * x)}\right) - \left(\frac{B * g * (a + b * x) * \text{Log}\left[\frac{e * (a + b * x)}{c + d * x}\right]}{d * i^2 * (c + d * x)}\right) - \left(\frac{b * g * \text{Log}\left[\frac{b * c - a * d}{b * (c + d * x)}\right] * (A + B * \text{Log}\left[\frac{e * (a + b * x)}{c + d * x}\right])}{d^2 * i^2} - \left(\frac{b * B * g * \text{PolyLog}\left[2, \frac{d * (a + b * x)}{b * (c + d * x)}\right]}{d^2 * i^2}\right)\right)$

**Rubi [A]** time = 0.403279, antiderivative size = 222, normalized size of antiderivative = 1.39, number of steps used = 15, number of rules used = 11, integrand size = 38,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.29$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{bBgPolyLog\left(2, \frac{b(c+dx)}{bc-ad}\right)}{d^2i^2} + \frac{bg \log(c+dx)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{d^2i^2} + \frac{g(bc-ad)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{d^2i^2(c+dx)} - \frac{Bg(bc-ad)}{d^2i^2(c+dx)} - \frac{bB}{d^2i^2(c+dx)}$$

Antiderivative was successfully verified.

[In]  $\text{Int}\left[\left(\frac{(a * g + b * g * x) * (A + B * \text{Log}\left[\frac{e * (a + b * x)}{c + d * x}\right])}{(c * i + d * i * x)^2}, x\right)\right]$

[Out]  $-\left(\frac{B * (b * c - a * d) * g}{d^2 * i^2 * (c + d * x)}\right) - \left(\frac{b * B * g * \text{Log}[a + b * x]}{d^2 * i^2}\right) + \left(\frac{(b * c - a * d) * g * (A + B * \text{Log}\left[\frac{e * (a + b * x)}{c + d * x}\right])}{d^2 * i^2 * (c + d * x)}\right) + \left(\frac{b * B * g * \text{Log}[c + d * x]}{d^2 * i^2} - \left(\frac{b * B * g * \text{Log}\left[-\left(\frac{d * (a + b * x)}{b * c - a * d}\right)\right] * \text{Log}[c + d * x]}{d^2 * i^2} + \left(\frac{b * g * (A + B * \text{Log}\left[\frac{e * (a + b * x)}{c + d * x}\right]) * \text{Log}[c + d * x]}{d^2 * i^2} + \left(\frac{b * B * g * \text{Log}[c + d * x]^2}{2 * d^2 * i^2} - \left(\frac{b * B * g * \text{PolyLog}\left[2, \left(\frac{b * (c + d * x)}{b * c - a * d}\right)\right]}{d^2 * i^2}\right)\right)\right)\right)$

### Rule 2528

$\text{Int}\left[\left(\frac{(a_. + \text{Log}[c_.] * (\text{RFx}_.)^{(p_.)} * (b_.))^{(n_.)} * (\text{RGx}_.)}{x\_Symbol}\right), x\_Symbol\right] := \text{With}\left[\{u = \text{ExpandIntegrand}\left[\left(\frac{a + b * \text{Log}[c * \text{RFx}^p]}{c + d * x}\right)^n, \text{RGx}, x\right], \text{Int}[u, x] /; \text{SumQ}[u]\right] /; \text{FreeQ}\{a, b, c, p\}, x\} \&\& \text{RationalFunctionQ}[\text{RFx}, x] \&\& \text{RationalFunctionQ}[\text{RGx}, x] \&\& \text{IGtQ}[n, 0]$

### Rule 2525



```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_) /; FreeQ[b, x]]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_.))^(m_.)*((c_.) + (d_.)*(x_.))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_.)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFX^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_.))^(n_.)]*(b_.))^(p_.)*(RFX_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFX, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFX, x] && IntegerQ[p]
```

### Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_.))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_.)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_.))]*(b_.))/((f_.) + (g_.)*(x_.)), x_Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
```

$(e*f - d*g), 0]$

### Rule 2391

$\text{Int}[\text{Log}[(c\_.)*((d\_.) + (e\_.)*(x\_)^{(n\_.)})]/(x\_), x\_Symbol] \text{ :> } -\text{Simp}[\text{PolyLog}[2, -(c*e*x^n)]/n, x] \text{ /; FreeQ}\{c, d, e, n\}, x] \ \&\& \ \text{EqQ}[c*d, 1]$

### Rule 2390

$\text{Int}[(a\_.) + \text{Log}[(c\_.)*((d\_.) + (e\_.)*(x\_)^{(n\_.)})]*(b\_.)^{(p\_.)}*((f\_.) + (g\_.)*(x\_)^{(q\_.)}), x\_Symbol] \text{ :> } \text{Dist}[1/e, \text{Subst}[\text{Int}[(f*x)/d]^q*(a + b*\text{Log}[c*x^n])^p, x], x, d + e*x], x] \text{ /; FreeQ}\{a, b, c, d, e, f, g, n, p, q\}, x] \ \&\& \ \text{EqQ}[e*f - d*g, 0]$

### Rule 2301

$\text{Int}[(a\_.) + \text{Log}[(c\_.)*(x\_)^{(n\_.)}]*b\_.)/(x\_), x\_Symbol] \text{ :> } \text{Simp}[(a + b*\text{Log}[c*x^n])^2/(2*b*n), x] \text{ /; FreeQ}\{a, b, c, n\}, x]$

### Rubi steps

$$\begin{aligned}
\int \frac{(ag + bgx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{(41c + 41dx)^2} dx &= \int \left( \frac{(-bc + ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{1681d(c + dx)^2} + \frac{bg \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{1681d(c + dx)} \right) dx \\
&= \frac{(bg) \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{c+dx} dx}{1681d} - \frac{((bc - ad)g) \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{(c+dx)^2} dx}{1681d} \\
&= \frac{(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{1681d^2(c + dx)} + \frac{bg \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) \log(c + dx)}{1681d^2} - \frac{(bBg)}{1681d^2} \\
&= \frac{(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{1681d^2(c + dx)} + \frac{bg \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) \log(c + dx)}{1681d^2} - \frac{(B(bg))}{1681d^2} \\
&= \frac{(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{1681d^2(c + dx)} + \frac{bg \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) \log(c + dx)}{1681d^2} - \frac{(B(bg))}{1681d^2} \\
&= -\frac{B(bc - ad)g}{1681d^2(c + dx)} - \frac{bBg \log(a + bx)}{1681d^2} + \frac{(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{1681d^2(c + dx)} + \frac{bBg}{1681d^2} \\
&= -\frac{B(bc - ad)g}{1681d^2(c + dx)} - \frac{bBg \log(a + bx)}{1681d^2} + \frac{(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{1681d^2(c + dx)} + \frac{bBg}{1681d^2} \\
&= -\frac{B(bc - ad)g}{1681d^2(c + dx)} - \frac{bBg \log(a + bx)}{1681d^2} + \frac{(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{1681d^2(c + dx)} + \frac{bBg}{1681d^2} \\
&= -\frac{B(bc - ad)g}{1681d^2(c + dx)} - \frac{bBg \log(a + bx)}{1681d^2} + \frac{(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{1681d^2(c + dx)} + \frac{bBg}{1681d^2}
\end{aligned}$$

**Mathematica [A]** time = 0.162783, size = 175, normalized size = 1.09

$$\frac{g \left( -bB \left( 2 \text{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right) + \log(c + dx) \left( 2 \log \left( \frac{d(a+bx)}{ad-bc} \right) - \log(c + dx) \right) \right) + 2b \log(c + dx) \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right) + \frac{2(bBg)}{1681d^2} \right)}{2d^2t^2}$$

Antiderivative was successfully verified.

[In] Integrate[((a\*g + b\*g\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])))/(c\*i + d\*i\*x)^2,x]

```
[Out] (g*((2*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c + d*x) + 2*b*(A
+ B*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x] - 2*B*((b*c - a*d)/(c + d*x
) + b*Log[a + b*x] - b*Log[c + d*x]) - b*B*((2*Log[(d*(a + b*x))/(-b*c) +
a*d]) - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d
)])))/(2*d^2*i^2)
```

**Maple [B]** time = 0.061, size = 978, normalized size = 6.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^2,x)
```

```
[Out] -1/d*g/(a*d-b*c)/i^2*A*b*a+1/d^2*g/(a*d-b*c)/i^2*A*b^2*c-g/(a*d-b*c)/i^2*A/
(d*x+c)*a^2+2/d*g/(a*d-b*c)/i^2*A/(d*x+c)*a*b*c-1/d^2*g/(a*d-b*c)/i^2*A/(d*
x+c)*b^2*c^2-1/d*g/(a*d-b*c)/i^2*A*b*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e
)*a+1/d^2*g/(a*d-b*c)/i^2*A*b^2*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c-1
/d*g/(a*d-b*c)/i^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*a+1/d^2*g/(a*d-b*c)/
i^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*c-g/(a*d-b*c)/i^2*B*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))/(d*x+c)*a^2+2/d*g/(a*d-b*c)/i^2*B*ln(b*e/d+(a*d-b*c)*e/d
/(d*x+c))/(d*x+c)*a*b*c-1/d^2*g/(a*d-b*c)/i^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x
+c))/(d*x+c)*b^2*c^2+1/d*g/(a*d-b*c)/i^2*B*b*a-1/d^2*g/(a*d-b*c)/i^2*B*b^2*
c+g/(a*d-b*c)/i^2*B/(d*x+c)*a^2-2/d*g/(a*d-b*c)/i^2*B/(d*x+c)*a*b*c+1/d^2*g
/(a*d-b*c)/i^2*B/(d*x+c)*b^2*c^2-1/d*g/(a*d-b*c)/i^2*B*b*dilog(-(d*(b*e/d+(
a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a+1/d^2*g/(a*d-b*c)/i^2*B*b^2*dilog(-(d*(b*
e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*c-1/d*g/(a*d-b*c)/i^2*B*b*ln(b*e/d+(a*
d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a+1/d^2*
g/(a*d-b*c)/i^2*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*
c)*e/d/(d*x+c))-b*e)/b/e)*c
```

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2} Bbg \left( \frac{(dx+c) \log(dx+c)^2 + 2c \log(dx+c)}{d^3 i^2 x + cd^2 i^2} - 2 \int \frac{dx \log(bx+a) + dx \log(e) + c}{d^3 i^2 x^2 + 2cd^2 i^2 x + c^2 d i^2} dx \right) + Abg \left( \frac{c}{d^3 i^2 x + cd^2 i^2} + \frac{\log(d)}{d^2} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(d\*i\*x+c\*i)^2,x, algorithm="maxima")

[Out] 
$$-1/2*B*b*g*((d*x + c)*\log(d*x + c)^2 + 2*c*\log(d*x + c))/(d^3*i^2*x + c*d^2*i^2) - 2*\int (d*x*\log(b*x + a) + d*x*\log(e) + c)/(d^3*i^2*x^2 + 2*c*d^2*i^2*x + c^2*d*i^2), x) + A*b*g*(c/(d^3*i^2*x + c*d^2*i^2) + \log(d*x + c)/(d^2*i^2)) - B*a*g*(\log(b*e*x/(d*x + c) + a*e/(d*x + c))/(d^2*i^2*x + c*d*i^2) - 1/(d^2*i^2*x + c*d*i^2) - b*\log(b*x + a)/((b*c*d - a*d^2)*i^2) + b*\log(d*x + c)/((b*c*d - a*d^2)*i^2)) - A*a*g/(d^2*i^2*x + c*d*i^2)$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{Abgx + Aag + (Bbgx + Bag) \log\left(\frac{bex+ae}{dx+c}\right)}{d^2i^2x^2 + 2cdi^2x + c^2i^2}, x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(d\*i\*x+c\*i)^2,x, algorithm="fricas")

[Out] 
$$\int (A*b*g*x + A*a*g + (B*b*g*x + B*a*g)*\log((b*e*x + a*e)/(d*x + c)))/(d^2*i^2*x^2 + 2*c*d*i^2*x + c^2*i^2), x$$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))/(d\*i\*x+c\*i)\*\*2,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)\left(B \log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)}{(dix + ci)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^2,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(B*log((b*x + a)*e/(d*x + c)) + A)/(d*i*x + c*i)^2, x)
```

$$3.42 \quad \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(ci+dix)^2} dx$$

**Optimal.** Leaf size=98

$$\frac{A(a+bx)}{i^2(c+dx)(bc-ad)} + \frac{B(a+bx) \log\left(\frac{e(a+bx)}{c+dx}\right)}{i^2(c+dx)(bc-ad)} - \frac{B(a+bx)}{i^2(c+dx)(bc-ad)}$$

[Out] (A\*(a + b\*x))/((b\*c - a\*d)\*i^2\*(c + d\*x)) - (B\*(a + b\*x))/((b\*c - a\*d)\*i^2\*(c + d\*x)) + (B\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x)])/((b\*c - a\*d)\*i^2\*(c + d\*x))

**Rubi [A]** time = 0.0729925, antiderivative size = 101, normalized size of antiderivative = 1.03, number of steps used = 4, number of rules used = 3, integrand size = 30,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.1$ , Rules used = {2525, 12, 44}

$$-\frac{B \log\left(\frac{e(a+bx)}{c+dx}\right) + A}{di^2(c+dx)} + \frac{bB \log(a+bx)}{di^2(bc-ad)} - \frac{bB \log(c+dx)}{di^2(bc-ad)} + \frac{B}{di^2(c+dx)}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])/(c\*i + d\*i\*x)^2, x]

[Out] B/(d\*i^2\*(c + d\*x)) + (b\*B\*Log[a + b\*x])/(d\*(b\*c - a\*d)\*i^2) - (A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])/(d\*i^2\*(c + d\*x)) - (b\*B\*Log[c + d\*x])/(d\*(b\*c - a\*d)\*i^2)

### Rule 2525

Int[((a\_) + Log[(c\_)\*(RFx\_)^(p\_)]\*(b\_))^(n\_)\*((d\_) + (e\_)\*(x\_))^(m\_), x\_Symbol] :> Simp[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^n)/(e\*(m + 1)), x] - Dist[(b\*n\*p)/(e\*(m + 1)), Int[SimplifyIntegrand[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

### Rule 12

Int[(a\_)\*(u\_), x\_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b\_)\*(v\_) /; FreeQ[b, x]]

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\begin{aligned} \int \frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(42c + 42dx)^2} dx &= -\frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{1764d(c + dx)} + \frac{B \int \frac{bc-ad}{42(a+bx)(c+dx)^2} dx}{42d} \\ &= -\frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{1764d(c + dx)} + \frac{(B(bc - ad)) \int \frac{1}{(a+bx)(c+dx)^2} dx}{1764d} \\ &= -\frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{1764d(c + dx)} + \frac{(B(bc - ad)) \int \left(\frac{b^2}{(bc-ad)^2(a+bx)} - \frac{d}{(bc-ad)(c+dx)^2} - \frac{bd}{(bc-ad)^2(c+dx)}\right) dx}{1764d} \\ &= \frac{B}{1764d(c + dx)} + \frac{bB \log(a + bx)}{1764d(bc - ad)} - \frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{1764d(c + dx)} - \frac{bB \log(c + dx)}{1764d(bc - ad)} \end{aligned}$$

**Mathematica [A]** time = 0.0482936, size = 104, normalized size = 1.06

$$\frac{-aAd + B(bc - ad) \log\left(\frac{e(a+bx)}{c+dx}\right) - bB(c + dx) \log(a + bx) + aBd + Abc + bBc \log(c + dx) + bBdx \log(c + dx) - bBc}{d^2(c + dx)(ad - bc)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x]))/(c*i + d*i*x)^2,x]
```

```
[Out] (A*b*c - b*B*c - a*A*d + a*B*d - b*B*(c + d*x)*Log[a + b*x] + B*(b*c - a*d)
*Log[(e*(a + b*x))/(c + d*x)] + b*B*c*Log[c + d*x] + b*B*d*x*Log[c + d*x])/
(d*(-(b*c) + a*d)*i^2*(c + d*x))
```

**Maple [B]** time = 0.05, size = 515, normalized size = 5.3

$$-\frac{Aba}{(ad - bc)^2 i^2} + \frac{Ab^2c}{d(ad - bc)^2 i^2} - \frac{dAa^2}{(ad - bc)^2 i^2 (dx + c)} + 2 \frac{Abac}{(ad - bc)^2 i^2 (dx + c)} - \frac{Ab^2c^2}{d(ad - bc)^2 i^2 (dx + c)} - \frac{Bba}{(ad - bc)^2 i^2}$$



Verification of antiderivative is not currently implemented for this CAS.

[In] `int((A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^2,x)`

[Out] 
$$\begin{aligned} & -1/(a*d-b*c)^2/i^2*A*b*a+1/d/(a*d-b*c)^2/i^2*A*b^2*c-d/(a*d-b*c)^2/i^2*A/(d \\ & *x+c)*a^2+2/(a*d-b*c)^2/i^2*A/(d*x+c)*a*b*c-1/d/(a*d-b*c)^2/i^2*A/(d*x+c)*b \\ & ^2*c^2-1/(a*d-b*c)^2/i^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*a+1/d/(a*d-b*c \\ & )^2/i^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*c-d/(a*d-b*c)^2/i^2*B*ln(b*e/ \\ & d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*a^2+2/(a*d-b*c)^2/i^2*B*ln(b*e/d+(a*d-b*c) \\ & *e/d/(d*x+c))/(d*x+c)*a*b*c-1/d/(a*d-b*c)^2/i^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d \\ & *x+c))/(d*x+c)*b^2*c^2+d/(a*d-b*c)^2/i^2*B/(d*x+c)*a^2-2/(a*d-b*c)^2/i^2*B/ \\ & (d*x+c)*a*b*c+1/d/(a*d-b*c)^2/i^2*B/(d*x+c)*b^2*c^2+1/(a*d-b*c)^2/i^2*B*b*a \\ & -1/d/(a*d-b*c)^2/i^2*B*b^2*c \end{aligned}$$

**Maxima [A]** time = 1.22939, size = 181, normalized size = 1.85

$$-B \left( \frac{\log\left(\frac{bex}{dx+c} + \frac{ae}{dx+c}\right)}{d^2i^2x + cdi^2} - \frac{1}{d^2i^2x + cdi^2} - \frac{b \log(bx + a)}{(bcd - ad^2)i^2} + \frac{b \log(dx + c)}{(bcd - ad^2)i^2} \right) - \frac{A}{d^2i^2x + cdi^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^2,x, algorithm="maxima")`

[Out] 
$$\begin{aligned} & -B*(\log(b*e*x/(d*x + c) + a*e/(d*x + c))/(d^2*i^2*x + c*d*i^2) - 1/(d^2*i^2 \\ & *x + c*d*i^2) - b*\log(b*x + a)/((b*c*d - a*d^2)*i^2) + b*\log(d*x + c)/((b*c \\ & *d - a*d^2)*i^2)) - A/(d^2*i^2*x + c*d*i^2) \end{aligned}$$

**Fricas [A]** time = 0.477514, size = 177, normalized size = 1.81

$$-\frac{(A - B)bc - (A - B)ad - (Bbdx + Bad) \log\left(\frac{bex+ae}{dx+c}\right)}{(bcd^2 - ad^3)i^2x + (bc^2d - acd^2)i^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^2,x, algorithm="fricas")`

[Out]  $-\left(\left(A - B\right) * b * c - \left(A - B\right) * a * d - \left(B * b * d * x + B * a * d\right) * \log\left(\left(b * e * x + a * e\right) / \left(d * x + c\right)\right)\right) / \left(\left(b * c * d^2 - a * d^3\right) * i^2 * x + \left(b * c^2 * d - a * c * d^2\right) * i^2\right)$

**Sympy [B]** time = 1.69012, size = 231, normalized size = 2.36

$$\frac{B b \log\left(x + \frac{-\frac{B a^2 b d^2}{a d - b c} + \frac{2 B a b^2 c d}{a d - b c} + B a b d - \frac{B b^3 c^2}{a d - b c} + B b^2 c}{2 B b^2 d}\right)}{d i^2 (a d - b c)} - \frac{B b \log\left(x + \frac{\frac{B a^2 b d^2}{a d - b c} - \frac{2 B a b^2 c d}{a d - b c} + B a b d + \frac{B b^3 c^2}{a d - b c} + B b^2 c}{2 B b^2 d}\right)}{d i^2 (a d - b c)} - \frac{B \log\left(\frac{e(a+b x)}{c+d x}\right)}{c d i^2 + d^2 i^2 x} - \frac{A - B}{c d i^2 + d^2 i^2 x}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)**2,x)`

[Out]  $B * b * \log\left(x + \left(-B * a ** 2 * b * d ** 2 / (a * d - b * c) + 2 * B * a * b ** 2 * c * d / (a * d - b * c) + B * a * b * d - B * b ** 3 * c ** 2 / (a * d - b * c) + B * b ** 2 * c\right) / \left(2 * B * b ** 2 * d\right) / \left(d * i ** 2 * (a * d - b * c)\right)\right) - B * b * \log\left(x + \left(B * a ** 2 * b * d ** 2 / (a * d - b * c) - 2 * B * a * b ** 2 * c * d / (a * d - b * c) + B * a * b * d + B * b ** 3 * c ** 2 / (a * d - b * c) + B * b ** 2 * c\right) / \left(2 * B * b ** 2 * d\right) / \left(d * i ** 2 * (a * d - b * c)\right)\right) - B * \log\left(e * (a + b * x) / (c + d * x)\right) / \left(c * d * i ** 2 + d ** 2 * i ** 2 * x\right) - (A - B) / \left(c * d * i ** 2 + d ** 2 * i ** 2 * x\right)$

**Giac [A]** time = 1.3797, size = 116, normalized size = 1.18

$$-\frac{B b \log(b x + a)}{b c d - a d^2} + \frac{B b \log(d x + c)}{b c d - a d^2} + \frac{B \log\left(\frac{b x + a}{d x + c}\right)}{d^2 x + c d} + \frac{A}{d^2 x + c d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^2,x, algorithm="giac")`

[Out]  $-B * b * \log(b * x + a) / (b * c * d - a * d^2) + B * b * \log(d * x + c) / (b * c * d - a * d^2) + B * \log\left(\frac{b * x + a}{d * x + c}\right) / (d^2 * x + c * d) + A / (d^2 * x + c * d)$

$$3.43 \quad \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)(ci+dix)^2} dx$$

**Optimal.** Leaf size=156

$$\frac{b\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)^2}{2Bgi^2(bc-ad)^2} - \frac{Ad(a+bx)}{gi^2(c+dx)(bc-ad)^2} - \frac{Bd(a+bx) \log\left(\frac{e(a+bx)}{c+dx}\right)}{gi^2(c+dx)(bc-ad)^2} + \frac{Bd(a+bx)}{gi^2(c+dx)(bc-ad)^2}$$

[Out]  $-\left(\frac{A*d*(a+b*x)}{(b*c-a*d)^2*g*i^2*(c+d*x)}\right) + \frac{B*d*(a+b*x)}{(b*c-a*d)^2*g*i^2*(c+d*x)} - \frac{B*d*(a+b*x)*\text{Log}\left[\frac{e*(a+b*x)}{c+d*x}\right]}{(b*c-a*d)^2*g*i^2*(c+d*x)} + \frac{(b*(A+B*\text{Log}\left[\frac{e*(a+b*x)}{c+d*x}\right]))^2}{(2*B*(b*c-a*d)^2*g*i^2)}$

**Rubi [C]** time = 0.713646, antiderivative size = 432, normalized size of antiderivative = 2.77, number of steps used = 24, number of rules used = 11, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.275$ , Rules used = {2528, 2524, 12, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 44}

$$\frac{bBPolyLog\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{gi^2(bc-ad)^2} + \frac{bBPolyLog\left(2, \frac{b(c+dx)}{bc-ad}\right)}{gi^2(bc-ad)^2} + \frac{b \log(a+bx) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{gi^2(bc-ad)^2} + \frac{B \log\left(\frac{e(a+bx)}{c+dx}\right) + A}{gi^2(c+dx)(bc-ad)} - \frac{b \log\left(\frac{e(a+bx)}{c+dx}\right)}{gi^2(c+dx)(bc-ad)}$$

Antiderivative was successfully verified.

[In]  $\text{Int}\left[\frac{A+B*\text{Log}\left[\frac{e*(a+b*x)}{c+d*x}\right]}{(a*g+b*g*x)*(c*i+d*i*x)^2}, x\right]$

[Out]  $-\frac{B}{(b*c-a*d)*g*i^2*(c+d*x)} - \frac{(b*B*\text{Log}[a+b*x])}{(b*c-a*d)^2*g*i^2} - \frac{(b*B*\text{Log}[a+b*x]^2)}{(2*(b*c-a*d)^2*g*i^2)} + \frac{(A+B*\text{Log}\left[\frac{e*(a+b*x)}{c+d*x}\right])}{(b*c-a*d)*g*i^2*(c+d*x)} + \frac{(b*\text{Log}[a+b*x]*(A+B*\text{Log}\left[\frac{e*(a+b*x)}{c+d*x}\right]))}{(b*c-a*d)^2*g*i^2} + \frac{(b*B*\text{Log}[c+d*x])}{(b*c-a*d)^2*g*i^2} + \frac{(b*B*\text{Log}\left[-\left(\frac{d*(a+b*x)}{b*c-a*d}\right)\right]*\text{Log}[c+d*x])}{(b*c-a*d)^2*g*i^2} - \frac{(b*(A+B*\text{Log}\left[\frac{e*(a+b*x)}{c+d*x}\right])*\text{Log}[c+d*x])}{(b*c-a*d)^2*g*i^2} - \frac{(b*B*\text{Log}[c+d*x]^2)}{(2*(b*c-a*d)^2*g*i^2)} + \frac{(b*B*\text{Log}[a+b*x]*\text{Log}\left[\frac{b*(c+d*x)}{b*c-a*d}\right])}{(b*c-a*d)^2*g*i^2} + \frac{(b*B*\text{PolyLog}[2, -\left(\frac{d*(a+b*x)}{b*c-a*d}\right)])}{(b*c-a*d)^2*g*i^2} + \frac{(b*B*\text{PolyLog}[2, \frac{b*(c+d*x)}{b*c-a*d}])}{(b*c-a*d)^2*g*i^2}$

**Rule 2528**

$\text{Int}\left[\frac{(a_.) + \text{Log}\left[(c_.)*(RFX_)^{(p_.)}\right]*(b_.)^{(n_.)}*(RGx_)}{(a+b*\text{Log}[c*RFX^p])^n}, x\_Symbol\right] \rightarrow \text{With}\left[\{u = \text{ExpandIntegrand}\left[(a+b*\text{Log}[c*RFX^p])^n, RGx, x\right]\}, \text{Int}[u, x] /; \text{SumQ}[u] /; \text{FreeQ}\{a, b, c, p\}, x\} \&\& \text{RationalFunctionQ}[RFX, x] \&\& \text{RationalFunctionQ}[RGx, x]\right]$

onQ[RGx, x] && IGtQ[n, 0]

### Rule 2524

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)/((d\_.) + (e\_.)\*(x\_.)), x\_Symbol] := Simp[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^n)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

### Rule 12

Int[(a\_)\*(u\_), x\_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b\_)\*(v\_)] /; FreeQ[b, x]

### Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_.))^(n\_.)]\*(b\_.))^(p\_.)\*(RFx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]

### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_.))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.)\*(x\_.))^(q\_.), x\_Symbol] := Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] := Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_.))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_.)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_.))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_.)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*

$(e*f - d*g), 0]$

### Rule 2391

$\text{Int}[\text{Log}[(c_.)*((d_.) + (e_.)*(x_)^{(n_.)})]/(x_), x\_Symbol] \text{ :> } -\text{Simp}[\text{PolyLog}[2, -(c*e*x^n)]/n, x] \text{ /; FreeQ}\{c, d, e, n\}, x \ \&\& \ \text{EqQ}[c*d, 1]$

### Rule 2525

$\text{Int}[(a_.) + \text{Log}[(c_.)*(Rfx_)^{(p_.)}]*(b_.))^{(n_.)}*((d_.) + (e_.)*(x_))^{(m_.)}, x\_Symbol] \text{ :> } \text{Simp}[(d + e*x)^{(m + 1)}*(a + b*\text{Log}[c*Rfx^p])^n/(e*(m + 1)), x] - \text{Dist}[(b*n*p)/(e*(m + 1)), \text{Int}[\text{SimplifyIntegrand}[(d + e*x)^{(m + 1)}*(a + b*\text{Log}[c*Rfx^p])^{(n - 1)}*D[Rfx, x])/Rfx, x], x], x] \text{ /; FreeQ}\{a, b, c, d, e, m, p\}, x \ \&\& \ \text{RationalFunctionQ}[Rfx, x] \ \&\& \ \text{IGtQ}[n, 0] \ \&\& \ (\text{EqQ}[n, 1] \ || \ \text{IntegerQ}[m]) \ \&\& \ \text{NeQ}[m, -1]$

### Rule 44

$\text{Int}[(a_.) + (b_.)*(x_))^{(m_.)}*((c_.) + (d_.)*(x_))^{(n_.)}, x\_Symbol] \text{ :> } \text{Int}[\text{ExpandIntegrand}[(a + b*x)^m*(c + d*x)^n, x], x] \text{ /; FreeQ}\{a, b, c, d\}, x \ \&\& \ \text{NeQ}[b*c - a*d, 0] \ \&\& \ \text{ILtQ}[m, 0] \ \&\& \ \text{IntegerQ}[n] \ \&\& \ !(\text{IGtQ}[n, 0] \ \&\& \ \text{LtQ}[m + n + 2, 0])$

### Rubi steps

$$\begin{aligned}
\int \frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(43c + 43dx)^2(ag + bgx)} dx &= \int \left( \frac{b^2 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{1849(bc - ad)^2 g(a + bx)} - \frac{d \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{1849(bc - ad)g(c + dx)^2} - \frac{bd \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{1849(bc - ad)^2 g(c + dx)} \right) dx \\
&= \frac{b^2 \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx} dx}{1849(bc - ad)^2 g} - \frac{(bd) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx} dx}{1849(bc - ad)^2 g} - \frac{d \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(c+dx)^2} dx}{1849(bc - ad)g} \\
&= \frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{1849(bc - ad)g(c + dx)} + \frac{b \log(a + bx) \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{1849(bc - ad)^2 g} - \frac{b \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{1849(bc - ad)g} \\
&= \frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{1849(bc - ad)g(c + dx)} + \frac{b \log(a + bx) \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{1849(bc - ad)^2 g} - \frac{b \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{1849(bc - ad)g} \\
&= \frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{1849(bc - ad)g(c + dx)} + \frac{b \log(a + bx) \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{1849(bc - ad)^2 g} - \frac{b \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{1849(bc - ad)g} \\
&= -\frac{B}{1849(bc - ad)g(c + dx)} - \frac{bB \log(a + bx)}{1849(bc - ad)^2 g} + \frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{1849(bc - ad)g(c + dx)} + \frac{b \log(a + bx)}{1849(bc - ad)g} \\
&= -\frac{B}{1849(bc - ad)g(c + dx)} - \frac{bB \log(a + bx)}{1849(bc - ad)^2 g} + \frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{1849(bc - ad)g(c + dx)} + \frac{b \log(a + bx)}{1849(bc - ad)g} \\
&= -\frac{B}{1849(bc - ad)g(c + dx)} - \frac{bB \log(a + bx)}{1849(bc - ad)^2 g} - \frac{bB \log^2(a + bx)}{3698(bc - ad)^2 g} + \frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{1849(bc - ad)g(c + dx)} \\
&= -\frac{B}{1849(bc - ad)g(c + dx)} - \frac{bB \log(a + bx)}{1849(bc - ad)^2 g} - \frac{bB \log^2(a + bx)}{3698(bc - ad)^2 g} + \frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{1849(bc - ad)g(c + dx)}
\end{aligned}$$

**Mathematica [C]** time = 0.288676, size = 292, normalized size = 1.87

$$\frac{-bB(c + dx) \left( \log(a + bx) \left( \log(a + bx) - 2 \log\left(\frac{b(c+dx)}{bc-ad}\right) \right) - 2 \text{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) \right) + bB(c + dx) \left( 2 \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right) + \right)}{1}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x]])/((a*g + b*g*x)*(c+i + d*i*x)
^2), x]
```

```
[Out] (2*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*b*(c + d*x)*Log[a +
b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 2*b*(c + d*x)*(A + B*Log[(e*(a
+ b*x))/(c + d*x)])*Log[c + d*x] - 2*B*(b*c - a*d + b*(c + d*x))*Log[a + b*
x] - b*(c + d*x)*Log[c + d*x] - b*B*(c + d*x)*(Log[a + b*x]*(Log[a + b*x]
- 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) +
a*d)]) + b*B*(c + d*x)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x]
)*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(2*(b*c - a*d)^2
*g*i^2*(c + d*x))
```

**Maple [B]** time = 0.053, size = 759, normalized size = 4.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i)^2,x)
```

```
[Out] -d/i^2/(a*d-b*c)^3/g*A*b*a+1/i^2/(a*d-b*c)^3/g*A*b^2*c-d^2/i^2/(a*d-b*c)^3/
g*A/(d*x+c)*a^2+2*d/i^2/(a*d-b*c)^3/g*A/(d*x+c)*a*b*c-1/i^2/(a*d-b*c)^3/g*A
/(d*x+c)*b^2*c^2+d/i^2/(a*d-b*c)^3/g*A*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-
1/i^2/(a*d-b*c)^3/g*A*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-d/i^2/(a*d-b*c)
^3/g*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*a+1/i^2/(a*d-b*c)^3/g*B*ln(b*e/d+(
a*d-b*c)*e/d/(d*x+c))*b^2*c-d^2/i^2/(a*d-b*c)^3/g*B*ln(b*e/d+(a*d-b*c)*e/d/
(d*x+c))/(d*x+c)*a^2+2*d/i^2/(a*d-b*c)^3/g*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)/(d*x+c)*a*b*c-1/i^2/(a*d-b*c)^3/g*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+
c)*b^2*c^2+d^2/i^2/(a*d-b*c)^3/g*B/(d*x+c)*a^2-2*d/i^2/(a*d-b*c)^3/g*B/(d*x
+c)*a*b*c+1/i^2/(a*d-b*c)^3/g*B/(d*x+c)*b^2*c^2+d/i^2/(a*d-b*c)^3/g*B*b*a-1
/i^2/(a*d-b*c)^3/g*B*b^2*c+1/2*d/i^2/(a*d-b*c)^3/g*B*b*ln(b*e/d+(a*d-b*c)*e
/d/(d*x+c))^2*a-1/2/i^2/(a*d-b*c)^3/g*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))
^2*c
```

**Maxima [B]** time = 1.2849, size = 568, normalized size = 3.64

$$B \left( \frac{1}{(bcd - ad^2)gi^2x + (bc^2 - acd)gi^2} + \frac{b \log(bx + a)}{(b^2c^2 - 2abcd + a^2d^2)gi^2} - \frac{b \log(dx + c)}{(b^2c^2 - 2abcd + a^2d^2)gi^2} \right) \log \left( \frac{bex}{dx + c} + \frac{ae}{dx + c} \right) +$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i)^2,x, algorit
hm="maxima")
```

[Out]  $B*(1/((b*c*d - a*d^2)*g*i^2*x + (b*c^2 - a*c*d)*g*i^2) + b*\log(b*x + a)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g*i^2) - b*\log(d*x + c)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g*i^2)) * \log(b*e*x/(d*x + c) + a*e/(d*x + c)) + A*(1/((b*c*d - a*d^2)*g*i^2*x + (b*c^2 - a*c*d)*g*i^2) + b*\log(b*x + a)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g*i^2) - b*\log(d*x + c)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g*i^2)) - 1/2*((b*d*x + b*c)*\log(b*x + a)^2 + (b*d*x + b*c)*\log(d*x + c)^2 + 2*b*c - 2*a*d + 2*(b*d*x + b*c)*\log(b*x + a) - 2*(b*d*x + b*c + (b*d*x + b*c)*\log(b*x + a))*\log(d*x + c))*B/(b^2*c^3*g*i^2 - 2*a*b*c^2*d*g*i^2 + a^2*c*d^2*g*i^2 + (b^2*c^2*d*g*i^2 - 2*a*b*c*d^2*g*i^2 + a^2*d^3*g*i^2)*x)$

**Fricas [A]** time = 0.511147, size = 328, normalized size = 2.1

$$\frac{2(A - B)bc - 2(A - B)ad + (Bbdx + Bbc) \log\left(\frac{bex+ae}{dx+c}\right)^2 + 2((A - B)bdx + Abc - Bad) \log\left(\frac{bex+ae}{dx+c}\right)}{2\left((b^2c^2d - 2abcd^2 + a^2d^3)gi^2x + (b^2c^3 - 2abc^2d + a^2cd^2)gi^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)/(d\*i\*x+c\*i)^2,x, algorithm="fricas")

[Out]  $1/2*(2*(A - B)*b*c - 2*(A - B)*a*d + (B*b*d*x + B*b*c)*\log((b*e*x + a*e)/(d*x + c))^2 + 2*((A - B)*b*d*x + A*b*c - B*a*d)*\log((b*e*x + a*e)/(d*x + c)))/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*g*i^2*x + (b^2*c^3 - 2*a*b*c^2*d + a^2*c*d^2)*g*i^2)$

**Sympy [B]** time = 3.11933, size = 386, normalized size = 2.47

$$\frac{Bb \log\left(\frac{e(a+bx)}{c+dx}\right)^2}{2a^2d^2gi^2 - 4abcdgi^2 + 2b^2c^2gi^2} - \frac{B \log\left(\frac{e(a+bx)}{c+dx}\right)}{acdgi^2 + ad^2gi^2x - bc^2gi^2 - bcdgi^2x} + (A - B) \left( \frac{b \log\left(x + \frac{-\frac{a^3bd^3}{(ad-bc)^2} + \frac{3a^2b^2cd^2}{(ad-bc)^2} - \frac{3ab^3c^2d}{(ad-bc)^2} + abd}{2b^2d}\right)}{gi^2(ad-bc)^2} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)/(d\*i\*x+c\*i)\*\*2,x)



```
[Out] B*b*log(e*(a + b*x)/(c + d*x))**2/(2*a**2*d**2*g*i**2 - 4*a*b*c*d*g*i**2 +
2*b**2*c**2*g*i**2) - B*log(e*(a + b*x)/(c + d*x))/(a*c*d*g*i**2 + a*d**2*g
*i**2*x - b*c**2*g*i**2 - b*c*d*g*i**2*x) + (A - B)*(-b*log(x + (-a**3*b*d*
*3/(a*d - b*c)**2 + 3*a**2*b**2*c*d**2/(a*d - b*c)**2 - 3*a*b**3*c**2*d/(a*
d - b*c)**2 + a*b*d + b**4*c**3/(a*d - b*c)**2 + b**2*c)/(2*b**2*d))/(g*i**
2*(a*d - b*c)**2) + b*log(x + (a**3*b*d**3/(a*d - b*c)**2 - 3*a**2*b**2*c*d
**2/(a*d - b*c)**2 + 3*a*b**3*c**2*d/(a*d - b*c)**2 + a*b*d - b**4*c**3/(a*
d - b*c)**2 + b**2*c)/(2*b**2*d))/(g*i**2*(a*d - b*c)**2) - 1/(a*c*d*g*i**2
- b*c**2*g*i**2 + x*(a*d**2*g*i**2 - b*c*d*g*i**2))
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{B \log\left(\frac{(bx+a)e}{dx+c}\right) + A}{(bgx + ag)(dix + ci)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i)^2,x, algorit
hm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)/((b*g*x + a*g)*(d*i*x + c*i)^2
), x)
```

$$3.44 \quad \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^2(ci+dix)^2} dx$$

**Optimal.** Leaf size=261

$$-\frac{b^2(c+dx)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{g^2i^2(a+bx)(bc-ad)^3} + \frac{d^2(a+bx)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{g^2i^2(c+dx)(bc-ad)^3} - \frac{2bd \log\left(\frac{a+bx}{c+dx}\right)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{g^2i^2(bc-ad)^3} - \frac{b^2B(c+dx)}{g^2i^2(a+bx)(bc-ad)^3}$$

[Out]  $-\left(\frac{Bd^2(a+bx)}{(bc-ad)^3g^2i^2(c+dx)} - \frac{b^2B(c+dx)}{(bc-ad)^3g^2i^2(a+bx)}\right) - \frac{b^2Bd \log\left(\frac{a+bx}{c+dx}\right)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{(bc-ad)^3g^2i^2(bc-ad)^3} + \frac{d^2(a+bx)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{g^2i^2(c+dx)(bc-ad)^3} - \frac{2bd \log\left(\frac{a+bx}{c+dx}\right)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{g^2i^2(bc-ad)^3}$

**Rubi [C]** time = 0.867815, antiderivative size = 462, normalized size of antiderivative = 1.77, number of steps used = 28, number of rules used = 11, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.275$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{2bBd \text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{g^2i^2(bc-ad)^3} - \frac{2bBd \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{g^2i^2(bc-ad)^3} - \frac{2bd \log(a+bx)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{g^2i^2(bc-ad)^3} - \frac{b\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{g^2i^2(a+bx)(bc-ad)^3}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))/((a\*g + b\*g\*x)^2\*(c\*i + d\*i\*x)^2), x]

[Out]  $-\left(\frac{Bd^2(a+bx)}{(bc-ad)^3g^2i^2(c+dx)} - \frac{b^2B(c+dx)}{(bc-ad)^3g^2i^2(a+bx)}\right) + \frac{b^2Bd \log\left(\frac{a+bx}{c+dx}\right)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{(bc-ad)^3g^2i^2(bc-ad)^3} + \frac{d^2(a+bx)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{g^2i^2(c+dx)(bc-ad)^3} - \frac{2bd \log\left(\frac{a+bx}{c+dx}\right)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{g^2i^2(bc-ad)^3}$

**Rule 2528**

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(Rfx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, Rfx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
Rfx, x] && IntegerQ[p]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
```

qQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] := Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n]))/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] := -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rubi steps

$$\begin{aligned}
\int \frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(44c + 44dx)^2(ag + bgx)^2} dx &= \int \left( \frac{b^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1936(bc - ad)^2 g^2 (a + bx)^2} - \frac{b^2 d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{968(bc - ad)^3 g^2 (a + bx)} + \frac{d^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1936(bc - ad)^2 g^2 (c + dx)} \right) dx \\
&= -\frac{(b^2 d) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx} dx}{968(bc - ad)^3 g^2} + \frac{(bd^2) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx} dx}{968(bc - ad)^3 g^2} + \frac{b^2 \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2} dx}{1936(bc - ad)^2 g^2} + \frac{d^2 \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx} dx}{1936(bc - ad)^2 g^2} \\
&= -\frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1936(bc - ad)^2 g^2 (a + bx)} - \frac{d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1936(bc - ad)^2 g^2 (c + dx)} - \frac{bd \log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{968(bc - ad)^3 g^2} \\
&= -\frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1936(bc - ad)^2 g^2 (a + bx)} - \frac{d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1936(bc - ad)^2 g^2 (c + dx)} - \frac{bd \log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{968(bc - ad)^3 g^2} \\
&= -\frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1936(bc - ad)^2 g^2 (a + bx)} - \frac{d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1936(bc - ad)^2 g^2 (c + dx)} - \frac{bd \log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{968(bc - ad)^3 g^2} \\
&= -\frac{bB}{1936(bc - ad)^2 g^2 (a + bx)} + \frac{Bd}{1936(bc - ad)^2 g^2 (c + dx)} - \frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1936(bc - ad)^2 g^2 (a + bx)} \\
&= -\frac{bB}{1936(bc - ad)^2 g^2 (a + bx)} + \frac{Bd}{1936(bc - ad)^2 g^2 (c + dx)} - \frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1936(bc - ad)^2 g^2 (a + bx)} \\
&= -\frac{bB}{1936(bc - ad)^2 g^2 (a + bx)} + \frac{Bd}{1936(bc - ad)^2 g^2 (c + dx)} + \frac{bBd \log^2(a + bx)}{1936(bc - ad)^3 g^2} - \frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1936(bc - ad)^2 g^2 (a + bx)} \\
&= -\frac{bB}{1936(bc - ad)^2 g^2 (a + bx)} + \frac{Bd}{1936(bc - ad)^2 g^2 (c + dx)} + \frac{bBd \log^2(a + bx)}{1936(bc - ad)^3 g^2} - \frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1936(bc - ad)^2 g^2 (a + bx)}
\end{aligned}$$

**Mathematica [C]** time = 0.452001, size = 324, normalized size = 1.24

$$\frac{bBd \left( \log(a + bx) \left( \log(a + bx) - 2 \log\left(\frac{b(c+dx)}{bc-ad}\right) \right) - 2 \text{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) \right) - bBd \left( 2 \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right) + \log(c + dx) \right) \left( 2 \log(a + bx) - \log(c + dx) \right)}{(44c + 44dx)^2 (ag + bgx)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x]))/((a*g + b*g*x)^2*(c*i + d*i*x)^2), x]
```

```
[Out] (-((b^2*B*c)/(a + b*x)) + (a*b*B*d)/(a + b*x) + (b*B*c*d)/(c + d*x) - (a*B*d^2)/(c + d*x) - (b*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x])))/(a + b*x) + (d*(-(b*c) + a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x])))/(c + d*x) - 2*b*d*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*b*d*(A + B*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x] + b*B*d*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - b*B*d*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/((b*c - a*d)^3*g^2*i^2)
```

**Maple [B]** time = 0.053, size = 1187, normalized size = 4.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x)
```

```
[Out] e*d/i^2/(a*d-b*c)^4/g^2*B*b^2/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+2*d^2/i^2/(a*d-b*c)^4/g^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*a*b*c-e/i^2/(a*d-b*c)^4/g^2*B*b^3/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+d^3/i^2/(a*d-b*c)^4/g^2*B/(d*x+c)*a^2-d^3/i^2/(a*d-b*c)^4/g^2*A/(d*x+c)*a^2+e*d/i^2/(a*d-b*c)^4/g^2*A*b^2/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)*a-d^2/i^2/(a*d-b*c)^4/g^2*A*b*a-d/i^2/(a*d-b*c)^4/g^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*b^2*c^2+d/i^2/(a*d-b*c)^4/g^2*A*b^2*c+d^2/i^2/(a*d-b*c)^4/g^2*B*b*a-d/i^2/(a*d-b*c)^4/g^2*B*b^2*c-d/i^2/(a*d-b*c)^4/g^2*A/(d*x+c)*b^2*c^2-e/i^2/(a*d-b*c)^4/g^2*B*b^3/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)*c+2*d^2/i^2/(a*d-b*c)^4/g^2*A/(d*x+c)*a*b*c+e*d/i^2/(a*d-b*c)^4/g^2*B*b^2/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)*a-e/i^2/(a*d-b*c)^4/g^2*A*b^3/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)*c+d/i^2/(a*d-b*c)^4/g^2*B/(d*x+c)*b^2*c^2-2*d/i^2/(a*d-b*c)^4/g^2*A*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+2*d^2/i^2/(a*d-b*c)^4/g^2*A*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+d^2/i^2/(a*d-b*c)^4/g^2*B*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a-d^2/i^2/(a*d-b*c)^4/g^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*a-d/i^2/(a*d-b*c)^4/g^2*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c+d/i^2/(a*d-b*c)^4/g^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*c-d^3/i^2/(a*d-b*c)^4/g^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*a^2-2*d^2/i^2/(a*d-b*c)^4/g^2*B/(d*x+c)*a*b*c
```

**Maxima [B]** time = 1.42633, size = 1160, normalized size = 4.44

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)^2/(d\*i\*x+c\*i)^2,x, algorithm="maxima")

[Out] 
$$-B*((2*b*d*x + b*c + a*d)/((b^3*c^2*d - 2*a*b^2*c*d^2 + a^2*b*d^3)*g^2*i^2*x^2 + (b^3*c^3 - a*b^2*c^2*d - a^2*b*c*d^2 + a^3*d^3)*g^2*i^2*x + (a*b^2*c^3 - 2*a^2*b*c^2*d + a^3*c*d^2)*g^2*i^2) + 2*b*d*log(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2*i^2) - 2*b*d*log(d*x + c)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2*i^2)*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - A*((2*b*d*x + b*c + a*d)/((b^3*c^2*d - 2*a*b^2*c*d^2 + a^2*b*d^3)*g^2*i^2*x^2 + (b^3*c^3 - a*b^2*c^2*d - a^2*b*c*d^2 + a^3*d^3)*g^2*i^2*x + (a*b^2*c^3 - 2*a^2*b*c^2*d + a^3*c*d^2)*g^2*i^2) + 2*b*d*log(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2*i^2) - 2*b*d*log(d*x + c)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2*i^2) - (b^2*c^2 - 2*a*b*c*d + a^2*d^2 - (b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(b*x + a)^2 + 2*(b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(b*x + a)*log(d*x + c) - (b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(d*x + c)^2)*B/(a*b^3*c^4*g^2*i^2 - 3*a^2*b^2*c^3*d*g^2*i^2 + 3*a^3*b*c^2*d^2*g^2*i^2 - a^4*c*d^3*g^2*i^2 + (b^4*c^3*d*g^2*i^2 - 3*a*b^3*c^2*d^2*g^2*i^2 + 3*a^2*b^2*c*d^3*g^2*i^2 - a^3*b*d^4*g^2*i^2)*x^2 + (b^4*c^4*g^2*i^2 - 2*a*b^3*c^3*d*g^2*i^2 + 2*a^3*b*c*d^3*g^2*i^2 - a^4*d^4*g^2*i^2)*x)$$

**Fricas [A]** time = 0.515332, size = 686, normalized size = 2.63

$$\frac{(A + B)b^2c^2 - 2Babcd - (A - B)a^2d^2 + (Bb^2d^2x^2 + Babcd + (Bb^2cd + Babd^2)x) \log\left(\frac{bex+ae}{dx+c}\right)^2 + 2(Ab^2cd - Aabd^2)x}{(b^4c^3d - 3ab^3c^2d^2 + 3a^2b^2cd^3 - a^3bd^4)g^2i^2x^2 + (b^4c^4 - 2ab^3c^3d + 2a^3bcd^3 - a^4d^4)g^2i^2x + (a*b^3*c^4 - 3*a^2*b^2*c^3*d + 3*a^3*b*c^2*d^2 - a^4*c*d^3)*g^2*i^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)^2/(d\*i\*x+c\*i)^2,x, algorithm="fricas")

[Out] 
$$-((A + B)*b^2*c^2 - 2*B*a*b*c*d - (A - B)*a^2*d^2 + (B*b^2*d^2*x^2 + B*a*b*c*d + (B*b^2*c*d + B*a*b*d^2)*x)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*b^2*c*d - A*a*b*d^2)*x + (2*A*b^2*d^2*x^2 + B*b^2*c^2 + 2*A*a*b*c*d - B*a^2*d^2 + 2*((A + B)*b^2*c*d + (A - B)*a*b*d^2)*x)*log((b*e*x + a*e)/(d*x + c)))/((b^4*c^3*d - 3*a*b^3*c^2*d^2 + 3*a^2*b^2*c*d^3 - a^3*b*d^4)*g^2*i^2*x^2 + (b^4*c^4 - 2*a*b^3*c^3*d + 2*a^3*b*c*d^3 - a^4*d^4)*g^2*i^2*x + (a*b^3*c^4 - 3*a^2*b^2*c^3*d + 3*a^3*b*c^2*d^2 - a^4*c*d^3)*g^2*i^2)$$

**Sympy [B]** time = 7.05368, size = 828, normalized size = 3.17

$$\frac{2Abd \log \left( x + \frac{-\frac{2Aa^4bd^5}{(ad-bc)^3} + \frac{8Aa^3b^2cd^4}{(ad-bc)^3} - \frac{12Aa^2b^3c^2d^3}{(ad-bc)^3} + \frac{8Aab^4c^3d^2}{(ad-bc)^3} + 2Aabd^2 - \frac{2Ab^5c^4d}{(ad-bc)^3} + 2Ab^2cd}{4Ab^2d^2} \right)}{g^2i^2(ad-bc)^3} + \frac{2Abd \log \left( x + \frac{\frac{2Aa^4bd^5}{(ad-bc)^3} - \frac{8Aa^3b^2cd^4}{(ad-bc)^3} + \frac{12Aa^2b^3c^2d^3}{(ad-bc)^3} - \frac{8Aa^4b^4c^3d^2}{(ad-bc)^3} + \frac{8Aa^3b^5c^4d}{(ad-bc)^3} - \frac{12Aa^2b^6c^5d^3}{(ad-bc)^3} + \frac{8Aab^7c^6d^2}{(ad-bc)^3} - \frac{8Aab^8c^7d}{(ad-bc)^3} + \frac{8Aab^9c^8}{(ad-bc)^3} + 2Aabd^2 - \frac{2Ab^5c^4d}{(ad-bc)^3} + 2Ab^2cd}{4Ab^2d^2} \right)}{g^2i^2(ad-bc)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)\*\*2/(d\*i\*x+c\*i)\*\*2,x)

[Out]  $-2A*b*d*\log(x + (-2A*a**4*b*d**5/(a*d - b*c)**3 + 8*A*a**3*b**2*c*d**4/(a*d - b*c)**3 - 12*A*a**2*b**3*c**2*d**3/(a*d - b*c)**3 + 8*A*a*b**4*c**3*d**2/(a*d - b*c)**3 + 2*A*a*b*d**2 - 2*A*b**5*c**4*d/(a*d - b*c)**3 + 2*A*b**2*c*d)/(4*A*b**2*d**2))/(g**2*i**2*(a*d - b*c)**3) + 2A*b*d*\log(x + (2A*a**4*b*d**5/(a*d - b*c)**3 - 8*A*a**3*b**2*c*d**4/(a*d - b*c)**3 + 12*A*a**2*b**3*c**2*d**3/(a*d - b*c)**3 - 8*A*a*b**4*c**3*d**2/(a*d - b*c)**3 + 2*A*a*b*d**2 + 2*A*b**5*c**4*d/(a*d - b*c)**3 + 2*A*b**2*c*d)/(4*A*b**2*d**2))/(g**2*i**2*(a*d - b*c)**3) + B*b*d*\log(e*(a + b*x)/(c + d*x))**2/(a**3*d**3*g**2*i**2 - 3*a**2*b*c*d**2*g**2*i**2 + 3*a*b**2*c**2*d*g**2*i**2 - b**3*c**3*g**2*i**2) + (-B*a*d - B*b*c - 2*B*b*d*x)*\log(e*(a + b*x)/(c + d*x))/(a**3*c*d**2*g**2*i**2 + a**3*d**3*g**2*i**2*x - 2*a**2*b*c**2*d*g**2*i**2 - a**2*b*c*d**2*g**2*i**2*x + a**2*b*d**3*g**2*i**2*x**2 + a*b**2*c**3*g**2*i**2**2 - a*b**2*c**2*d*g**2*i**2*x - 2*a*b**2*c*d**2*g**2*i**2*x**2 + b**3*c**3*g**2*i**2*x + b**3*c**2*d*g**2*i**2*x**2) - (A*a*d + A*b*c + 2*A*b*d*x - B*a*d + B*b*c)/(a**3*c*d**2*g**2*i**2 - 2*a**2*b*c**2*d*g**2*i**2 + a*b**2*c**3*g**2*i**2 + x**2*(a**2*b*d**3*g**2*i**2 - 2*a*b**2*c*d**2*g**2*i**2 + b**3*c**2*d*g**2*i**2) + x*(a**3*d**3*g**2*i**2 - a**2*b*c*d**2*g**2*i**2 - a*b**2*c**2*d*g**2*i**2 + b**3*c**3*g**2*i**2))$

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{B \log \left( \frac{(bx+a)e}{dx+c} \right) + A}{(bgx + ag)^2 (dix + ci)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)^2/(d\*i\*x+c\*i)^2,x, algorithm="giac")



```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)/((b*g*x + a*g)^2*(d*i*x + c*i)^2), x)
```

$$3.45 \quad \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^3(ci+dix)^2} dx$$

**Optimal.** Leaf size=364

$$-\frac{b^3(c+dx)^2 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{2g^3i^2(a+bx)^2(bc-ad)^4} + \frac{3b^2d(c+dx) \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{g^3i^2(a+bx)(bc-ad)^4} + \frac{3bd^2 \log\left(\frac{a+bx}{c+dx}\right) \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{g^3i^2(bc-ad)^4} - \frac{d^3(a+bx)}{g^3i^2(c+dx)(bc-ad)^4}$$

[Out]  $(B*d^3*(a+b*x))/((b*c-a*d)^4*g^3*i^2*(c+d*x)) + (3*b^2*B*d*(c+d*x))/((b*c-a*d)^4*g^3*i^2*(a+b*x)) - (b^3*B*(c+d*x)^2)/(4*(b*c-a*d)^4*g^3*i^2*(a+b*x)^2) - (3*b*B*d^2*Log[(a+b*x)/(c+d*x)]^2)/(2*(b*c-a*d)^4*g^3*i^2) - (d^3*(a+b*x)*(A+B*Log[(e*(a+b*x))/(c+d*x])))/((b*c-a*d)^4*g^3*i^2*(c+d*x)) + (3*b^2*d*(c+d*x)*(A+B*Log[(e*(a+b*x))/(c+d*x])))/((b*c-a*d)^4*g^3*i^2*(a+b*x)) - (b^3*(c+d*x)^2*(A+B*Log[(e*(a+b*x))/(c+d*x])))/(2*(b*c-a*d)^4*g^3*i^2*(a+b*x)^2) + (3*b*d^2*Log[(a+b*x)/(c+d*x)]*(A+B*Log[(e*(a+b*x))/(c+d*x])))/((b*c-a*d)^4*g^3*i^2)$

**Rubi [C]** time = 1.11731, antiderivative size = 630, normalized size of antiderivative = 1.73, number of steps used = 32, number of rules used = 11, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.275$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{3bBd^2 \text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{g^3i^2(bc-ad)^4} + \frac{3bBd^2 \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{g^3i^2(bc-ad)^4} + \frac{3bd^2 \log(a+bx) \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{g^3i^2(bc-ad)^4} + \frac{d^2 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{g^3i^2(c+dx)(bc-ad)^4}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])]/((a\*g + b\*g\*x)^3\*(c\*i + d\*i\*x)^2), x]

[Out]  $-(b*B)/(4*(b*c-a*d)^2*g^3*i^2*(a+b*x)^2) + (5*b*B*d)/(2*(b*c-a*d)^3*g^3*i^2*(a+b*x)) - (B*d^2)/((b*c-a*d)^3*g^3*i^2*(c+d*x)) + (3*b*B*d^2*Log[a+b*x])/(2*(b*c-a*d)^4*g^3*i^2) - (3*b*B*d^2*Log[a+b*x]^2)/(2*(b*c-a*d)^4*g^3*i^2) - (b*(A+B*Log[(e*(a+b*x))/(c+d*x])))/(2*(b*c-a*d)^2*g^3*i^2*(a+b*x)^2) + (2*b*d*(A+B*Log[(e*(a+b*x))/(c+d*x])))/((b*c-a*d)^3*g^3*i^2*(a+b*x)) + (d^2*(A+B*Log[(e*(a+b*x))/(c+d*x])))/((b*c-a*d)^3*g^3*i^2*(c+d*x)) + (3*b*d^2*Log[a+b*x]*(A+B*Log[(e*(a+b*x))/(c+d*x])))/((b*c-a*d)^3*g^3*i^2*(c+d*x)) + (3*b*d^2*Log[a+b*x]^2*(A+B*Log[(e*(a+b*x))/(c+d*x])))/((b*c-a*d)^4*g^3*i^2) - (3*b*B*d^2*Log[c+d*x])/(2*(b*c-a*d)^4*g^3*i^2) + (3*b*B*d^2*Log[-((d*(a+b*x))/(b*c-a*d))]*Log[c+d*x])/(2*(b*c-a*d)^4*g^3*i^2) - (3*b*d^2*(A+B*Log[(e*(a+b*x))/(c+d*x])))/((b*c-a*d)^4*g^3*i^2)$

$$\frac{d*x)]*Log[c + d*x]}{(b*c - a*d)^4*g^3*i^2) - (3*b*B*d^2*Log[c + d*x]^2)/}$$

$$\frac{(2*(b*c - a*d)^4*g^3*i^2) + (3*b*B*d^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])}{(b*c - a*d)^4*g^3*i^2) + (3*b*B*d^2*PolyLog[2, -(d*(a + b*x))/(b*c - a*d)])}$$

$$\frac{(b*(c + d*x))/(b*c - a*d)]}{(b*c - a*d)^4*g^3*i^2)}$$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_.))^(m_.)*((c_.) + (d_.)*(x_.))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_.)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_.))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
```

```
Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFX, x] && IntegerQ[p]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rubi steps

$$\begin{aligned}
\int \frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(45c + 45dx)^2(ag + bgx)^3} dx &= \int \left( \frac{b^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2025(bc - ad)^2 g^3 (a + bx)^3} - \frac{2b^2 d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2025(bc - ad)^3 g^3 (a + bx)^2} + \frac{b^2 d^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{675(bc - ad)^4 g^3 (a + bx)} \right) dx \\
&= \frac{(b^2 d^2) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx} dx}{675(bc - ad)^4 g^3} - \frac{(bd^3) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx} dx}{675(bc - ad)^4 g^3} - \frac{(2b^2 d) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2} dx}{2025(bc - ad)^3 g^3} \\
&= -\frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4050(bc - ad)^2 g^3 (a + bx)^2} + \frac{2bd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2025(bc - ad)^3 g^3 (a + bx)} + \frac{d^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2025(bc - ad)^3 g^3 (c + dx)} \\
&= -\frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4050(bc - ad)^2 g^3 (a + bx)^2} + \frac{2bd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2025(bc - ad)^3 g^3 (a + bx)} + \frac{d^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2025(bc - ad)^3 g^3 (c + dx)} \\
&= -\frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4050(bc - ad)^2 g^3 (a + bx)^2} + \frac{2bd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2025(bc - ad)^3 g^3 (a + bx)} + \frac{d^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2025(bc - ad)^3 g^3 (c + dx)} \\
&= -\frac{bB}{8100(bc - ad)^2 g^3 (a + bx)^2} + \frac{bBd}{810(bc - ad)^3 g^3 (a + bx)} - \frac{Bd^2}{2025(bc - ad)^3 g^3 (c + dx)} \\
&= -\frac{bB}{8100(bc - ad)^2 g^3 (a + bx)^2} + \frac{bBd}{810(bc - ad)^3 g^3 (a + bx)} - \frac{Bd^2}{2025(bc - ad)^3 g^3 (c + dx)} \\
&= -\frac{bB}{8100(bc - ad)^2 g^3 (a + bx)^2} + \frac{bBd}{810(bc - ad)^3 g^3 (a + bx)} - \frac{Bd^2}{2025(bc - ad)^3 g^3 (c + dx)} \\
&= -\frac{bB}{8100(bc - ad)^2 g^3 (a + bx)^2} + \frac{bBd}{810(bc - ad)^3 g^3 (a + bx)} - \frac{Bd^2}{2025(bc - ad)^3 g^3 (c + dx)}
\end{aligned}$$

**Mathematica [C]** time = 0.790855, size = 453, normalized size = 1.24

$$\frac{-6bBd^2 \left( \log(a + bx) \left( \log(a + bx) - 2 \log\left(\frac{b(c+dx)}{bc-ad}\right) \right) - 2 \text{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) \right) + 6bBd^2 \left( 2 \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right) + \log(c + dx) \right)}{(45c + 45dx)^2 (ag + bgx)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x]))/((a*g + b*g*x)^3*(c*i + d*i*x)^2), x]
```

```
[Out] (-((b*B*(b*c - a*d)^2)/(a + b*x)^2) + (8*b^2*B*c*d)/(a + b*x) - (8*a*b*B*d^2)/(a + b*x) + (2*b*B*d*(b*c - a*d))/(a + b*x) - (4*b*B*c*d^2)/(c + d*x) + (4*a*B*d^3)/(c + d*x) + 6*b*B*d^2*Log[a + b*x] - (2*b*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a + b*x)^2 + (8*b*d*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a + b*x) + (4*d^2*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c + d*x) + 12*b*d^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 6*b*B*d^2*Log[c + d*x] - 12*b*d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] - 6*b*B*d^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)])) - 2*PolyLog[2, (d*(a + b*x))/(-b*c + a*d)] + 6*b*B*d^2*((2*Log[(d*(a + b*x))/(-b*c + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(4*(b*c - a*d)^4*g^3*i^2)
```

**Maple [B]** time = 0.056, size = 1635, normalized size = 4.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x)
```

```
[Out] -d^4/i^2/(a*d-b*c)^5/g^3*A/(d*x+c)*a^2+d^4/i^2/(a*d-b*c)^5/g^3*B/(d*x+c)*a^2+2*d^3/i^2/(a*d-b*c)^5/g^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*a*b*c-1/2*e^2*d/i^2/(a*d-b*c)^5/g^3*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+3*e*d^2/i^2/(a*d-b*c)^5/g^3*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-3*e*d/i^2/(a*d-b*c)^5/g^3*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+1/2*e^2/i^2/(a*d-b*c)^5/g^3*B*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-d^2/i^2/(a*d-b*c)^5/g^3*B*b^2*c-d^3/i^2/(a*d-b*c)^5/g^3*A*b*a+d^2/i^2/(a*d-b*c)^5/g^3*A*b^2*c+1/4*e^2/i^2/(a*d-b*c)^5/g^3*B*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c+1/2*e^2/i^2/(a*d-b*c)^5/g^3*A*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c+d^2/i^2/(a*d-b*c)^5/g^3*B/(d*x+c)*b^2*c^2-d^2/i^2/(a*d-b*c)^5/g^3*A/(d*x+c)*b^2*c^2-3*d^2/i^2/(a*d-b*c)^5/g^3*A*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-3/2*d^2/i^2/(a*d-b*c)^5/g^3*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c+d^2/i^2/(a*d-b*c)^5/g^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*c-d^3/i^2/(a*d-b*c)^5/g^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*a^2+3/2*d^3/i^2/(a*d-b*c)^5/g^3*B*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+3*d^3/i^2/(a*d-b*c)^5/g^3*A*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-1/2*e^2*d/i^2/(a*d-b*c)^5/g^3*A*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a+d^3/i^2/(a*d-b*c)^5/g^3*B*b*a-3*e*d/i^2/(a*d-b*c)^5/g^3*A*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c+3*e*d^2/i^2/(a*d-b*c)^5/g^3*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-3*e*d/i^2/(a*d-b*c)^5/g^3*B*b^3/(b*e/d+e/
```

$$\frac{(d*x+c)*a-e/d/(d*x+c)*b*c)*c+3*e*d^2/i^2/(a*d-b*c)^5/g^3*A*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+2*d^3/i^2/(a*d-b*c)^5/g^3*A/(d*x+c)*a*b*c-2*d^3/i^2/(a*d-b*c)^5/g^3*B/(d*x+c)*a*b*c-1/4*e^2*d/i^2/(a*d-b*c)^5/g^3*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a-d^2/i^2/(a*d-b*c)^5/g^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)))/(d*x+c)*b^2*c^2$$

**Maxima [B]** time = 1.85233, size = 2323, normalized size = 6.38

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x, algorithm="maxima")
```

```
[Out] 1/2*B*((6*b^2*d^2*x^2 - b^2*c^2 + 5*a*b*c*d + 2*a^2*d^2 + 3*(b^2*c*d + 3*a*b*d^2)*x)/((b^5*c^3*d - 3*a*b^4*c^2*d^2 + 3*a^2*b^3*c*d^3 - a^3*b^2*d^4)*g^3*i^2*x^3 + (b^5*c^4 - a*b^4*c^3*d - 3*a^2*b^3*c^2*d^2 + 5*a^3*b^2*c*d^3 - 2*a^4*b*d^4)*g^3*i^2*x^2 + (2*a*b^4*c^4 - 5*a^2*b^3*c^3*d + 3*a^3*b^2*c^2*d^2 + a^4*b*c*d^3 - a^5*d^4)*g^3*i^2*x + (a^2*b^3*c^4 - 3*a^3*b^2*c^3*d + 3*a^4*b*c^2*d^2 - a^5*c*d^3)*g^3*i^2) + 6*b*d^2*log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^3*i^2) - 6*b*d^2*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^3*i^2))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 1/2*A*((6*b^2*d^2*x^2 - b^2*c^2 + 5*a*b*c*d + 2*a^2*d^2 + 3*(b^2*c*d + 3*a*b*d^2)*x)/((b^5*c^3*d - 3*a*b^4*c^2*d^2 + 3*a^2*b^3*c*d^3 - a^3*b^2*d^4)*g^3*i^2*x^3 + (b^5*c^4 - a*b^4*c^3*d - 3*a^2*b^3*c^2*d^2 + 5*a^3*b^2*c*d^3 - 2*a^4*b*d^4)*g^3*i^2*x^2 + (2*a*b^4*c^4 - 5*a^2*b^3*c^3*d + 3*a^3*b^2*c^2*d^2 + a^4*b*c*d^3 - a^5*d^4)*g^3*i^2*x + (a^2*b^3*c^4 - 3*a^3*b^2*c^3*d + 3*a^4*b*c^2*d^2 - a^5*c*d^3)*g^3*i^2) + 6*b*d^2*log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^3*i^2) - 6*b*d^2*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^3*i^2)) - 1/4*(b^3*c^3 - 12*a*b^2*c^2*d + 15*a^2*b*c*d^2 - 4*a^3*d^3 - 6*(b^3*c*d^2 - a*b^2*d^3)*x^2 + 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a)^2 + 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(d*x + c)^2 - 3*(3*b^3*c^2*d - 2*a*b^2*c*d^2 - a^2*b*d^3)*x - 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a) + 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x) - 2*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a))*log(d*x + c))*B/(a^2*b^4*c^5*g^3*i^2 - 4*a^3*b^3*c^4*d*g^3*i^2 +
```

$$6a^4b^2c^3d^2g^3i^2 - 4a^5b^2c^2d^3g^3i^2 + a^6c^4d^2g^3i^2 + (b^6c^4d^2g^3i^2 - 4a^5b^2c^3d^2g^3i^2 + 6a^2b^4c^2d^3g^3i^2 - 4a^3b^3c^2d^4g^3i^2 + a^4b^2d^5g^3i^2)x^3 + (b^6c^5g^3i^2 - 2a^5b^5c^4d^2g^3i^2 - 2a^2b^4c^3d^2g^3i^2 + 8a^3b^3c^2d^3g^3i^2 - 7a^4b^2c^2d^4g^3i^2 + 2a^5b^2d^5g^3i^2)x^2 + (2a^5b^5c^5g^3i^2 - 7a^2b^4c^4d^2g^3i^2 + 8a^3b^3c^3d^2g^3i^2 - 2a^4b^2c^2d^3g^3i^2 - 2a^5b^2c^2d^3g^3i^2 - 2a^5b^2c^2d^3g^3i^2 + a^6d^5g^3i^2)x$$

**Fricas [A]** time = 0.568439, size = 1368, normalized size = 3.76

$$\frac{(2A + B)b^3c^3 - 12(A + B)ab^2c^2d + 3(2A + 5B)a^2bcd^2 + 4(A - B)a^3d^3 - 6((2A + B)b^3cd^2 - (2A + B)ab^2d^3)x^2 - 6((b^6c^4d - 4ab^5c^3d^2 + 6a^2b^4c^2d^3 - 4a^3b^3c^2d^4 + a^4b^2d^5)g^3i^2x^3 + (b^6c^5 - 2a^5b^5c^4d - 2a^2b^4c^3d^2 + 8a^3b^3c^2d^3 - 7a^4b^2c^2d^4 + 2a^5b^2d^5)g^3i^2x^2 + (2a^5b^5c^5 - 7a^2b^4c^4d + 8a^3b^3c^3d^2 - 2a^4b^2c^2d^3 - 2a^5b^2c^2d^3 + a^6d^5)g^3i^2x + (a^2b^4c^5 - 4a^3b^3c^4d + 6a^4b^2c^3d^2 - 4a^5b^2c^2d^3 + a^6c^4d^2)g^3i^2)}{4((b^6c^4d - 4ab^5c^3d^2 + 6a^2b^4c^2d^3 - 4a^3b^3c^2d^4 + a^4b^2d^5)g^3i^2x^3 + (b^6c^5 - 2a^5b^5c^4d - 2a^2b^4c^3d^2 + 8a^3b^3c^2d^3 - 7a^4b^2c^2d^4 + 2a^5b^2d^5)g^3i^2x^2 + (2a^5b^5c^5 - 7a^2b^4c^4d + 8a^3b^3c^3d^2 - 2a^4b^2c^2d^3 - 2a^5b^2c^2d^3 + a^6d^5)g^3i^2x + (a^2b^4c^5 - 4a^3b^3c^4d + 6a^4b^2c^3d^2 - 4a^5b^2c^2d^3 + a^6c^4d^2)g^3i^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)^3/(d\*i\*x+c\*i)^2,x, algorith="fricas")

[Out] 
$$-1/4*((2A + B)*b^3c^3 - 12*(A + B)*a*b^2c^2*d + 3*(2A + 5B)*a^2*b*c*d^2 + 4*(A - B)*a^3*d^3 - 6*((2A + B)*b^3*c*d^2 - (2A + B)*a*b^2*d^3)*x^2 - 6*(B*b^3*d^3*x^3 + B*a^2*b*c*d^2 + (B*b^3*c*d^2 + 2*B*a*b^2*d^3)*x^2 + (2*B*a*b^2*c*d^2 + B*a^2*b*d^3)*x)*\log((b*e*x + a*e)/(d*x + c))^2 - 3*((2A + 3B)*b^3*c^2*d + 2*(2A - B)*a*b^2*c*d^2 - (6A + B)*a^2*b*d^3)*x - 2*(3*(2A + B)*b^3*d^3*x^3 - B*b^3*c^3 + 6*B*a*b^2*c^2*d + 6*A*a^2*b*c*d^2 - 2*B*a^3*d^3 + 3*((2A + 3B)*b^3*c*d^2 + 4*A*a*b^2*d^3)*x^2 + 3*(B*b^3*c^2*d + 4*(A + B)*a*b^2*c*d^2 + 2*(A - B)*a^2*b*d^3)*x)*\log((b*e*x + a*e)/(d*x + c)))/(b^6c^4d - 4a^5b^5c^3d^2 + 6a^2b^4c^2d^3 - 4a^3b^3c^2d^4 + a^4b^2d^5)g^3i^2x^3 + (b^6c^5 - 2a^5b^5c^4d - 2a^2b^4c^3d^2 + 8a^3b^3c^2d^3 - 7a^4b^2c^2d^4 + 2a^5b^2d^5)g^3i^2x^2 + (2a^5b^5c^5 - 7a^2b^4c^4d + 8a^3b^3c^3d^2 - 2a^4b^2c^2d^3 - 2a^5b^2c^2d^3 + a^6d^5)g^3i^2x + (a^2b^4c^5 - 4a^3b^3c^4d + 6a^4b^2c^3d^2 - 4a^5b^2c^2d^3 + a^6c^4d^2)g^3i^2)$$

**Sympy [B]** time = 29.6713, size = 1562, normalized size = 4.29

result too large to display

Verification of antiderivative is not currently implemented for this CAS.



[In] integrate((A+B\*ln(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)\*\*3/(d\*i\*x+c\*i)\*\*2,x)

[Out] 
$$\frac{3Bbd^2 \log\left(\frac{e(a+bx)}{c+dx}\right)^2}{(2a^4d^4g^3i^2 - 8a^3bc^3d^3g^3i^2 + 12a^2b^2c^2d^2g^3i^2 - 8ab^3c^3d^3g^3i^2 + 2b^4c^4g^3i^2) - 3bd^2(2A+B)\log(x + \frac{6Aabd^3 + 6A^2bcd^2 + 3Babd^3 + 3B^2cd^2 - 3a^5bd^7(2A+B)}{(ad-bc)^4 + 15a^4b^2cd^6(2A+B)/(ad-bc)^4 - 30a^3b^3c^2d^5(2A+B)/(ad-bc)^4 + 30a^2b^4c^3d^4(2A+B)/(ad-bc)^4 - 15ab^5c^4d^3(2A+B)/(ad-bc)^4 + 3b^6c^5d^2(2A+B)/(ad-bc)^4})}{(12A^2bd^3 + 6B^2d^3)} \frac{1}{(2g^3i^2(ad-bc)^4) + 3bd^2(2A+B)\log(x + \frac{6Aabd^3 + 6A^2bcd^2 + 3Babd^3 + 3B^2cd^2 + 3a^5bd^7(2A+B)}{(ad-bc)^4 - 15a^4b^2cd^6(2A+B)/(ad-bc)^4 + 30a^3b^3c^2d^5(2A+B)/(ad-bc)^4 - 30a^2b^4c^3d^4(2A+B)/(ad-bc)^4 + 15ab^5c^4d^3(2A+B)/(ad-bc)^4 - 3b^6c^5d^2(2A+B)/(ad-bc)^4})} \frac{1}{(12A^2bd^3 + 6B^2d^3)} \frac{1}{(2g^3i^2(ad-bc)^4) + (-2B^2d^2 - 5B^2bcd - 9B^2bd^2x + B^2c^2 - 3B^2cdx - 6B^2d^2x^2)\log\left(\frac{e(a+bx)}{c+dx}\right) + (2a^5cd^3g^3i^2 + 2a^4bd^4g^3i^2x - 6a^4b^2cd^2g^3i^2 - 2a^4bc^3d^3g^3i^2x + 4a^4bd^4g^3i^2x^2 + 6a^3b^2c^3d^3g^3i^2 - 6a^3b^2cd^2g^3i^2x - 10a^3b^2cd^3g^3i^2x^2 + 2a^3bd^4g^3i^2x^3 - 2a^2b^3c^4g^3i^2 + 10a^2b^3cd^3g^3i^2x + 6a^2b^3cd^2g^3i^2x^2 - 6a^2b^3cd^3g^3i^2x^3 - 4ab^4c^4g^3i^2x + 2ab^4c^3d^3g^3i^2x^2 + 6ab^4cd^2g^3i^2x^3 - 2b^5c^4g^3i^2x^2 - 2b^5cd^3g^3i^2x^3) - (4A^2d^2 + 10A^2bcd - 2A^2cd^2 - 4B^2d^2 + 11B^2bcd - B^2c^2 + x^2(12A^2bd^2 + 6B^2d^2) + x(18A^2abd^2 + 6A^2bcd + 3B^2abd^2 + 9B^2cd^2))}{(4a^5cd^3g^3i^2 - 12a^4b^2cd^2g^3i^2 + 12a^3b^2c^3d^3g^3i^2 - 4a^2b^3c^4g^3i^2 + x^3(4a^3b^2d^4g^3i^2 - 12a^2b^3cd^3g^3i^2 + 12ab^4cd^2g^3i^2 - 4b^5c^3d^3g^3i^2) + x^2(8a^4bd^4g^3i^2 - 20a^3b^2cd^3g^3i^2 + 12a^2b^3cd^2g^3i^2 + 4ab^4cd^3g^3i^2 - 4b^5c^4g^3i^2) + x(4a^5d^4g^3i^2 - 4a^4b^2cd^3g^3i^2 - 12a^3b^2cd^2g^3i^2 + 20a^2b^3cd^3g^3i^2 - 8ab^4cd^4g^3i^2)}$$

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{B \log\left(\frac{(bx+a)e}{dx+c}\right) + A}{(bgx + ag)^3 (dix + ci)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)/((b*g*x + a*g)^3*(d*i*x + c*i)^2), x)
```

$$3.46 \quad \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^4(ci+dix)^2} dx$$

**Optimal.** Leaf size=457

$$\frac{6b^2d^2(c+dx)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^4i^2(a+bx)(bc-ad)^5} - \frac{b^4(c+dx)^3\left(B \log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3g^4i^2(a+bx)^3(bc-ad)^5} + \frac{2b^3d(c+dx)^2\left(B \log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^4i^2(a+bx)^2(bc-ad)^5} - \frac{4bd^3}{g^4i^2(a+bx)(bc-ad)^5}$$

[Out]  $-\left(\frac{B*d^4*(a+b*x)}{(b*c-a*d)^5*g^4*i^2*(c+d*x)}\right) - \left(\frac{6*b^2*B*d^2*(c+d*x)}{(b*c-a*d)^5*g^4*i^2*(a+b*x)} + \frac{b^3*B*d*(c+d*x)^2}{(b*c-a*d)^5*g^4*i^2*(a+b*x)^2} - \frac{b^4*B*(c+d*x)^3}{(9*(b*c-a*d)^5*g^4*i^2*(a+b*x)^3} + \frac{(2*b*B*d^3*Log[(a+b*x)/(c+d*x)]^2)}{(b*c-a*d)^5*g^4*i^2} + \frac{d^4*(a+b*x)*(A+B*Log[(e*(a+b*x))/(c+d*x)])}{(b*c-a*d)^5*g^4*i^2*(c+d*x)} - \left(\frac{6*b^2*d^2*(c+d*x)*(A+B*Log[(e*(a+b*x))/(c+d*x)])}{(b*c-a*d)^5*g^4*i^2*(a+b*x)} + \frac{(2*b^3*d*(c+d*x)^2*(A+B*Log[(e*(a+b*x))/(c+d*x)])}{(b*c-a*d)^5*g^4*i^2*(a+b*x)^2} - \frac{b^4*(c+d*x)^3*(A+B*Log[(e*(a+b*x))/(c+d*x)])}{(3*(b*c-a*d)^5*g^4*i^2*(a+b*x)^3} - \frac{(4*b*d^3*Log[(a+b*x)/(c+d*x)]*(A+B*Log[(e*(a+b*x))/(c+d*x)])}{(b*c-a*d)^5*g^4*i^2}\right)$

**Rubi [C]** time = 1.36281, antiderivative size = 705, normalized size of antiderivative = 1.54, number of steps used = 36, number of rules used = 11, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.275$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{4bBa^3 \text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{g^4i^2(bc-ad)^5} - \frac{4bBa^3 \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{g^4i^2(bc-ad)^5} - \frac{4bd^3 \log(a+bx)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^4i^2(bc-ad)^5} - \frac{d^3\left(B \log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^4i^2(c+dx)(bc-ad)^5}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])/(a\*g + b\*g\*x)^4\*(c\*i + d\*i\*x)^2), x]

[Out]  $-\frac{(b*B)}{(9*(b*c-a*d)^2*g^4*i^2*(a+b*x)^3} + \frac{(2*b*B*d)}{(3*(b*c-a*d)^3*g^4*i^2*(a+b*x)^2} - \frac{(13*b*B*d^2)}{(3*(b*c-a*d)^4*g^4*i^2*(a+b*x)} + \frac{(B*d^3)}{(b*c-a*d)^4*g^4*i^2*(c+d*x)} - \frac{(10*b*B*d^3*Log[a+b*x])}{(3*(b*c-a*d)^5*g^4*i^2} + \frac{(2*b*B*d^3*Log[a+b*x]^2)}{(b*c-a*d)^5*g^4*i^2} - \frac{(b*(A+B*Log[(e*(a+b*x))/(c+d*x)])}{(3*(b*c-a*d)^2*g^4*i^2*(a+b*x)^3} + \frac{(b*d*(A+B*Log[(e*(a+b*x))/(c+d*x)])}{(b*c-a*d)^3*g^4*i^2*(a+b*x)^2} - \frac{(3*b*d^2*(A+B*Log[(e*(a+b*x))/(c+d*x)])}{(b*c-a*d)^4*g^4*i^2*(a+b*x)} - \frac{(d^3*(A+B*Log[(e*(a+b*x))/(c+d*x)])}{(b*c-a*d)^5*g^4*i^2}$

$$4g^{4i^2}(c + dx) - (4b^3d^3 \log[a + bx](A + B \log[(e(a + bx))/(c + dx)])) / ((b^5c - a^5d)g^{4i^2} + (10b^3Bd^3 \log[c + dx]) / (3(b^5c - a^5d)g^{4i^2} - (4b^3Bd^3 \log[-((d(a + bx))/(b^5c - a^5d))] \log[c + dx]) / ((b^5c - a^5d)g^{4i^2} + (4b^3d^3(A + B \log[(e(a + bx))/(c + dx)]) \log[c + dx]) / ((b^5c - a^5d)g^{4i^2} + (2b^3Bd^3 \log[c + dx]^2) / ((b^5c - a^5d)g^{4i^2} - (4b^3Bd^3 \log[a + bx] \log[(b(c + dx))/(b^5c - a^5d)]) / ((b^5c - a^5d)g^{4i^2} - (4b^3Bd^3 \text{PolyLog}[2, -((d(a + bx))/(b^5c - a^5d))]) / ((b^5c - a^5d)g^{4i^2} - (4b^3Bd^3 \text{PolyLog}[2, (b(c + dx))/(b^5c - a^5d)]) / ((b^5c - a^5d)g^{4i^2}))$$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]
] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_) /; FreeQ[b, x]]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n]]^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}
\int \frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(46c + 46dx)^2(ag + bgx)^4} dx &= \int \left( \frac{b^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2116(bc - ad)^2 g^4 (a + bx)^4} - \frac{b^2 d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1058(bc - ad)^3 g^4 (a + bx)^3} + \frac{3b^2 d^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2116(bc - ad)^4 g^4 (a + bx)^2} \right) dx \\
&= -\frac{(b^2 d^3) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx} dx}{529(bc - ad)^5 g^4} + \frac{(bd^4) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx} dx}{529(bc - ad)^5 g^4} + \frac{(3b^2 d^2) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2} dx}{2116(bc - ad)^4 g^4} \\
&= -\frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{6348(bc - ad)^2 g^4 (a + bx)^3} + \frac{bd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2116(bc - ad)^3 g^4 (a + bx)^2} - \frac{3bd^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2116(bc - ad)^4 g^4 (a + bx)} \\
&= -\frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{6348(bc - ad)^2 g^4 (a + bx)^3} + \frac{bd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2116(bc - ad)^3 g^4 (a + bx)^2} - \frac{3bd^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2116(bc - ad)^4 g^4 (a + bx)} \\
&= -\frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{6348(bc - ad)^2 g^4 (a + bx)^3} + \frac{bd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2116(bc - ad)^3 g^4 (a + bx)^2} - \frac{3bd^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2116(bc - ad)^4 g^4 (a + bx)} \\
&= -\frac{bB}{19044(bc - ad)^2 g^4 (a + bx)^3} + \frac{bBd}{3174(bc - ad)^3 g^4 (a + bx)^2} - \frac{13bBd^2}{6348(bc - ad)^4 g^4 (a + bx)} \\
&= -\frac{bB}{19044(bc - ad)^2 g^4 (a + bx)^3} + \frac{bBd}{3174(bc - ad)^3 g^4 (a + bx)^2} - \frac{13bBd^2}{6348(bc - ad)^4 g^4 (a + bx)} \\
&= -\frac{bB}{19044(bc - ad)^2 g^4 (a + bx)^3} + \frac{bBd}{3174(bc - ad)^3 g^4 (a + bx)^2} - \frac{13bBd^2}{6348(bc - ad)^4 g^4 (a + bx)} \\
&= -\frac{bB}{19044(bc - ad)^2 g^4 (a + bx)^3} + \frac{bBd}{3174(bc - ad)^3 g^4 (a + bx)^2} - \frac{13bBd^2}{6348(bc - ad)^4 g^4 (a + bx)}
\end{aligned}$$

**Mathematica [C]** time = 1.42348, size = 520, normalized size = 1.14

$$-\frac{18bBd^3 \left( \log(a + bx) \left( \log(a + bx) - 2 \log\left(\frac{b(c+dx)}{bc-ad}\right) \right) - 2 \text{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) \right) + 18bBd^3 \left( 2 \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right) + \log(c + dx) \right)}{(46c + 46dx)^2 (ag + bgx)^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x]))/((a*g + b*g*x)^4*(c*i + d*i*x)^2), x]
```

```
[Out] -((b*B*(b*c - a*d)^3)/(a + b*x)^3 - (6*b*B*d*(b*c - a*d)^2)/(a + b*x)^2 + (
27*b^2*B*c*d^2)/(a + b*x) - (27*a*b*B*d^3)/(a + b*x) + (12*b*B*d^2*(b*c - a
*d))/(a + b*x) - (9*b*B*c*d^3)/(c + d*x) + (9*a*B*d^4)/(c + d*x) + 30*b*B*d
^3*Log[a + b*x] + (3*b*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/
(a + b*x)^3 - (9*b*d*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a
+ b*x)^2 + (27*b*d^2*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a
+ b*x) - (9*d^3*(-(b*c) + a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c + d
*x) + 36*b*d^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 30*b*B*d
^3*Log[c + d*x] - 36*b*d^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x
] - 18*b*B*d^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d
)])) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)] + 18*b*B*d^3*((2*Log[(d*(
a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c
+ d*x))/(b*c - a*d)]))/(9*(b*c - a*d)^5*g^4*i^2)
```

**Maple [B]** time = 0.055, size = 2068, normalized size = 4.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x)
```

```
[Out] -2*e^2*d^2/i^2/(a*d-b*c)^6/g^4*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*
ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+2*e^2*d/i^2/(a*d-b*c)^6/g^4*B*b^4/(b*e/d+
e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-6*e*d^2/i^
2/(a*d-b*c)^6/g^4*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b
*c)*e/d/(d*x+c))*c+d^4/i^2/(a*d-b*c)^6/g^4*B*b*a-d^3/i^2/(a*d-b*c)^6/g^4*B*
b^2*c-d^4/i^2/(a*d-b*c)^6/g^4*A*b*a+d^3/i^2/(a*d-b*c)^6/g^4*A*b^2*c-d^3/i^2
/(a*d-b*c)^6/g^4*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*b^2*c^2-1/3*e^3/
i^2/(a*d-b*c)^6/g^4*B*b^5/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a
*d-b*c)*e/d/(d*x+c))*c-2*e^2*d^2/i^2/(a*d-b*c)^6/g^4*A*b^3/(b*e/d+e/(d*x+c)
*a-e/d/(d*x+c)*b*c)^2*a+2*d^4/i^2/(a*d-b*c)^6/g^4*A/(d*x+c)*a*b*c-d^5/i^2/(
a*d-b*c)^6/g^4*A/(d*x+c)*a^2+d^5/i^2/(a*d-b*c)^6/g^4*B/(d*x+c)*a^2+6*e*d^3/
i^2/(a*d-b*c)^6/g^4*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))*a+1/3*e^3*d/i^2/(a*d-b*c)^6/g^4*B*b^4/(b*e/d+e/(d*x+c)*a
-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+1/9*e^3*d/i^2/(a*d-b*
c)^6/g^4*B*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a-4*d^3/i^2/(a*d-b*c)^
6/g^4*A*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+2*d^4/i^2/(a*d-b*c)^6/g^4*B*b
*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a-2*d^3/i^2/(a*d-b*c)^6/g^4*B*b^2*ln(b*e
/d+(a*d-b*c)*e/d/(d*x+c))^2*c-d^5/i^2/(a*d-b*c)^6/g^4*B*ln(b*e/d+(a*d-b*c)*
e/d/(d*x+c))/(d*x+c)*a^2-d^4/i^2/(a*d-b*c)^6/g^4*B*ln(b*e/d+(a*d-b*c)*e/d/(
d*x+c))*b*a+d^3/i^2/(a*d-b*c)^6/g^4*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*c
```

$$\begin{aligned}
& +4*d^4/i^2/(a*d-b*c)^6/g^4*A*b*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+d^3/i^2/(a \\
& *d-b*c)^6/g^4*B/(d*x+c)*b^2*c^2-1/9*e^3/i^2/(a*d-b*c)^6/g^4*B*b^5/(b*e/d+e/ \\
& (d*x+c)*a-e/d/(d*x+c)*b*c)^3*c-1/3*e^3/i^2/(a*d-b*c)^6/g^4*A*b^5/(b*e/d+e/( \\
& d*x+c)*a-e/d/(d*x+c)*b*c)^3*c-d^3/i^2/(a*d-b*c)^6/g^4*A/(d*x+c)*b^2*c^2+6*e \\
& *d^3/i^2/(a*d-b*c)^6/g^4*A*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-2*d^4/ \\
& i^2/(a*d-b*c)^6/g^4*B/(d*x+c)*a*b*c-6*e*d^2/i^2/(a*d-b*c)^6/g^4*A*b^3/(b*e/ \\
& d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c-e^2*d^2/i^2/(a*d-b*c)^6/g^4*B*b^3/(b*e/d+e \\
& /d/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a+e^2*d/i^2/(a*d-b*c)^6/g^4*B*b^4/(b*e/d+e/(d \\
& *x+c)*a-e/d/(d*x+c)*b*c)^2*c+2*e^2*d/i^2/(a*d-b*c)^6/g^4*A*b^4/(b*e/d+e/(d* \\
& x+c)*a-e/d/(d*x+c)*b*c)^2*c+1/3*e^3*d/i^2/(a*d-b*c)^6/g^4*A*b^4/(b*e/d+e/(d \\
& *x+c)*a-e/d/(d*x+c)*b*c)^3*a+6*e*d^3/i^2/(a*d-b*c)^6/g^4*B*b^2/(b*e/d+e/(d* \\
& x+c)*a-e/d/(d*x+c)*b*c)*a-6*e*d^2/i^2/(a*d-b*c)^6/g^4*B*b^3/(b*e/d+e/(d*x+c \\
& )*a-e/d/(d*x+c)*b*c)*c+2*d^4/i^2/(a*d-b*c)^6/g^4*B*\ln(b*e/d+(a*d-b*c)*e/d/( \\
& d*x+c))/(d*x+c)*a*b*c
\end{aligned}$$

**Maxima [B]** time = 2.42841, size = 3456, normalized size = 7.56

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)^4/(d\*i\*x+c\*i)^2,x, algorithm="maxima")

[Out] 
$$\begin{aligned}
& -1/3*B*((12*b^3*d^3*x^3 + b^3*c^3 - 5*a*b^2*c^2*d + 13*a^2*b*c*d^2 + 3*a^3* \\
& d^3 + 6*(b^3*c*d^2 + 5*a*b^2*d^3)*x^2 - 2*(b^3*c^2*d - 8*a*b^2*c*d^2 - 11*a \\
& ^2*b*d^3)*x)/((b^7*c^4*d - 4*a*b^6*c^3*d^2 + 6*a^2*b^5*c^2*d^3 - 4*a^3*b^4* \\
& c*d^4 + a^4*b^3*d^5)*g^4*i^2*x^4 + (b^7*c^5 - a*b^6*c^4*d - 6*a^2*b^5*c^3*d \\
& ^2 + 14*a^3*b^4*c^2*d^3 - 11*a^4*b^3*c*d^4 + 3*a^5*b^2*d^5)*g^4*i^2*x^3 + 3 \\
& *(a*b^6*c^5 - 3*a^2*b^5*c^4*d + 2*a^3*b^4*c^3*d^2 + 2*a^4*b^3*c^2*d^3 - 3*a \\
& ^5*b^2*c*d^4 + a^6*b*d^5)*g^4*i^2*x^2 + (3*a^2*b^5*c^5 - 11*a^3*b^4*c^4*d + \\
& 14*a^4*b^3*c^3*d^2 - 6*a^5*b^2*c^2*d^3 - a^6*b*c*d^4 + a^7*d^5)*g^4*i^2*x \\
& + (a^3*b^4*c^5 - 4*a^4*b^3*c^4*d + 6*a^5*b^2*c^3*d^2 - 4*a^6*b*c^2*d^3 + a^ \\
& 7*c*d^4)*g^4*i^2) + 12*b*d^3*log(b*x + a)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^ \\
& 2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^4*i^2) - 12 \\
& *b*d^3*log(d*x + c)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3 \\
& *b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^4*i^2))*log(b*e*x/(d*x + c) + a*e \\
& /d/(d*x + c)) - 1/3*A*((12*b^3*d^3*x^3 + b^3*c^3 - 5*a*b^2*c^2*d + 13*a^2*b*c \\
& *d^2 + 3*a^3*d^3 + 6*(b^3*c*d^2 + 5*a*b^2*d^3)*x^2 - 2*(b^3*c^2*d - 8*a*b^2 \\
& *c*d^2 - 11*a^2*b*d^3)*x)/((b^7*c^4*d - 4*a*b^6*c^3*d^2 + 6*a^2*b^5*c^2*d^3 \\
& - 4*a^3*b^4*c*d^4 + a^4*b^3*d^5)*g^4*i^2*x^4 + (b^7*c^5 - a*b^6*c^4*d - 6* \\
& a^2*b^5*c^3*d^2 + 14*a^3*b^4*c^2*d^3 - 11*a^4*b^3*c*d^4 + 3*a^5*b^2*d^5)*g^
\end{aligned}$$



$$\begin{aligned}
& 4i^2x^3 + 3(a^6b^5c^5 - 3a^2b^5c^4d + 2a^3b^4c^3d^2 + 2a^4b^3c^2d^3 - 3a^5b^2c^4d + a^6b^5d^5)g^4i^2x^2 + (3a^2b^5c^5 - 11a^3b^4c^4d + 14a^4b^3c^3d^2 - 6a^5b^2c^2d^3 - a^6b^5c^4d + a^7d^5)g^4i^2x + (a^3b^4c^5 - 4a^4b^3c^4d + 6a^5b^2c^3d^2 - 4a^6b^3c^2d^3 + a^7c^4d^4)g^4i^2 + 12b^3d^3 \log(bx + a) / ((b^5c^5 - 5a^4b^4c^4d + 10a^2b^3c^3d^2 - 10a^3b^2c^2d^3 + 5a^4b^3c^4d - a^5d^5)g^4i^2) - 12b^3d^3 \log(dx + c) / ((b^5c^5 - 5a^4b^4c^4d + 10a^2b^3c^3d^2 - 10a^3b^2c^2d^3 + 5a^4b^3c^4d - a^5d^5)g^4i^2) - 1/9(b^4c^4 - 9a^3b^3c^3d + 54a^2b^2c^2d^2 - 55a^3b^3c^4d + 9a^4d^4 + 30(b^4c^3d - a^3b^3d^4)x^3 + 3(11b^4c^2d^2 + 8a^3b^3c^4d - 19a^2b^2d^4)x^2 - 18(b^4d^4x^4 + a^3b^3c^4d + (b^4c^3d + 3a^3b^3d^4)x^3 + 3(a^3b^3c^4d + a^2b^2d^4)x^2 + (3a^2b^2c^4d + a^3b^3d^4)x) \log(bx + a)^2 - 18(b^4d^4x^4 + a^3b^3c^4d + (b^4c^3d + 3a^3b^3d^4)x^3 + 3(a^3b^3c^4d + a^2b^2d^4)x^2 + (3a^2b^2c^4d + a^3b^3d^4)x) \log(dx + c)^2 - (5b^4c^3d - 81a^3b^3c^2d^2 + 57a^2b^2c^4d + 19a^3b^4d^4)x + 30(b^4d^4x^4 + a^3b^3c^4d + (b^4c^3d + 3a^3b^3d^4)x^3 + 3(a^3b^3c^4d + a^2b^2d^4)x^2 + (3a^2b^2c^4d + a^3b^3d^4)x) \log(bx + a) - 6(5b^4d^4x^4 + 5a^3b^3c^4d + 5(b^4c^3d + 3a^3b^3d^4)x^3 + 15(a^3b^3c^4d + a^2b^2d^4)x^2 + 5(3a^2b^2c^4d + a^3b^3d^4)x - 6(b^4d^4x^4 + a^3b^3c^4d + (b^4c^3d + 3a^3b^3d^4)x^3 + 3(a^3b^3c^4d + a^2b^2d^4)x^2 + (3a^2b^2c^4d + a^3b^3d^4)x) \log(bx + a) \log(dx + c)) * B / (a^3b^5c^6g^4i^2 - 5a^4b^4c^5d^3g^4i^2 + 10a^5b^3c^4d^2g^4i^2 - 10a^6b^2c^3d^3g^4i^2 + 5a^7b^5c^2d^4g^4i^2 - a^8c^5d^3g^4i^2 + (b^8c^5d^3g^4i^2 - 5a^6b^7c^4d^2g^4i^2 + 10a^2b^6c^3d^3g^4i^2 - 10a^3b^5c^2d^4g^4i^2 + 5a^4b^4c^5d^5g^4i^2 - a^5b^3d^6g^4i^2)x^4 + (b^8c^6g^4i^2 - 2a^6b^7c^5d^3g^4i^2 - 5a^2b^6c^4d^2g^4i^2 + 20a^3b^5c^3d^3g^4i^2 - 25a^4b^4c^2d^4g^4i^2 + 14a^5b^3c^5d^5g^4i^2 - 3a^6b^2d^6g^4i^2)x^3 + 3(a^6b^7c^6g^4i^2 - 4a^2b^6c^5d^3g^4i^2 + 5a^3b^5c^4d^2g^4i^2 - 5a^5b^3c^2d^4g^4i^2 + 4a^6b^2c^5d^5g^4i^2 - a^7b^6d^6g^4i^2)x^2 + (3a^2b^6c^6g^4i^2 - 14a^3b^5c^5d^3g^4i^2 + 25a^4b^4c^4d^2g^4i^2 - 20a^5b^3c^3d^3g^4i^2 + 5a^6b^2c^2d^4g^4i^2 + 2a^7b^5c^5d^5g^4i^2 - a^8d^6g^4i^2)x)
\end{aligned}$$


---

**Fricas [B]** time = 0.612324, size = 2101, normalized size = 4.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)^4/(d\*i\*x+c\*i)^2,x, algorithm="fricas")

```
[Out] -1/9*((3*A + B)*b^4*c^4 - 9*(2*A + B)*a*b^3*c^3*d + 54*(A + B)*a^2*b^2*c^2*d^2 - 5*(6*A + 11*B)*a^3*b*c*d^3 - 9*(A - B)*a^4*d^4 + 6*((6*A + 5*B)*b^4*c*d^3 - (6*A + 5*B)*a*b^3*d^4)*x^3 + 3*((6*A + 11*B)*b^4*c^2*d^2 + 8*(3*A + B)*a*b^3*c*d^3 - (30*A + 19*B)*a^2*b^2*d^4)*x^2 + 18*(B*b^4*d^4*x^4 + B*a^3*b*c*d^3 + (B*b^4*c*d^3 + 3*B*a*b^3*d^4)*x^3 + 3*(B*a*b^3*c*d^3 + B*a^2*b^2*d^4)*x^2 + (3*B*a^2*b^2*c*d^3 + B*a^3*b*d^4)*x)*log((b*e*x + a*e)/(d*x + c))^2 - ((6*A + 5*B)*b^4*c^3*d - 27*(2*A + 3*B)*a*b^3*c^2*d^2 - 3*(6*A - 19*B)*a^2*b^2*c*d^3 + (66*A + 19*B)*a^3*b*d^4)*x + 3*(2*(6*A + 5*B)*b^4*d^4*x^4 + B*b^4*c^4 - 6*B*a*b^3*c^3*d + 18*B*a^2*b^2*c^2*d^2 + 12*A*a^3*b*c*d^3 - 3*B*a^4*d^4 + 2*((6*A + 11*B)*b^4*c*d^3 + 9*(2*A + B)*a*b^3*d^4)*x^3 + 6*(B*b^4*c^2*d^2 + 3*(2*A + 3*B)*a*b^3*c*d^3 + 6*A*a^2*b^2*d^4)*x^2 - 2*(B*b^4*c^3*d - 9*B*a*b^3*c^2*d^2 - 18*(A + B)*a^2*b^2*c*d^3 - 6*(A - B)*a^3*b*d^4)*x)*log((b*e*x + a*e)/(d*x + c)))/((b^8*c^5*d - 5*a*b^7*c^4*d^2 + 10*a^2*b^6*c^3*d^3 - 10*a^3*b^5*c^2*d^4 + 5*a^4*b^4*c*d^5 - a^5*b^3*d^6)*g^4*i^2*x^4 + (b^8*c^6 - 2*a*b^7*c^5*d - 5*a^2*b^6*c^4*d^2 + 20*a^3*b^5*c^3*d^3 - 25*a^4*b^4*c^2*d^4 + 14*a^5*b^3*c*d^5 - 3*a^6*b^2*d^6)*g^4*i^2*x^3 + 3*(a*b^7*c^6 - 4*a^2*b^6*c^5*d + 5*a^3*b^5*c^4*d^2 - 5*a^5*b^3*c^2*d^4 + 4*a^6*b^2*c*d^5 - a^7*b*d^6)*g^4*i^2*x^2 + (3*a^2*b^6*c^6 - 14*a^3*b^5*c^5*d + 25*a^4*b^4*c^4*d^2 - 20*a^5*b^3*c^3*d^3 + 5*a^6*b^2*c^2*d^4 + 2*a^7*b*c*d^5 - a^8*d^6)*g^4*i^2*x + (a^3*b^5*c^6 - 5*a^4*b^4*c^5*d + 10*a^5*b^3*c^4*d^2 - 10*a^6*b^2*c^3*d^3 + 5*a^7*b*c^2*d^4 - a^8*c*d^5)*g^4*i^2)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**4/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{B \log\left(\frac{(bx+a)e}{dx+c}\right) + A}{(bgx + ag)^4 (dix + ci)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)/((b*g*x + a*g)^4*(d*i*x + c*i)^2), x)
```

$$3.47 \quad \int \frac{(ag+bgx)^3 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{(ci+dix)^3} dx$$

**Optimal.** Leaf size=361

$$\frac{3b^2Bg^3(bc-ad)\text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)}{d^4i^3} + \frac{b^2g^3(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(3B\log\left(\frac{e(a+bx)}{c+dx}\right) + 3A + B\right)}{d^4i^3} + \frac{g^3(a+bx)^2(bc-ad)\left(3\right)}{2d^2i^3}$$

[Out]  $(-3*B*(b*c - a*d)*g^3*(a + b*x)^2)/(4*d^2*i^3*(c + d*x)^2) - (3*b*B*(b*c - a*d)*g^3*(a + b*x))/(d^3*i^3*(c + d*x)) + (b*(3*A + B)*(b*c - a*d)*g^3*(a + b*x))/(d^3*i^3*(c + d*x)) + (3*b*B*(b*c - a*d)*g^3*(a + b*x)*\text{Log}[(e*(a + b*x))/(c + d*x)]/(d^3*i^3*(c + d*x)) + (g^3*(a + b*x)^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(d*i^3*(c + d*x)^2) + ((b*c - a*d)*g^3*(a + b*x)^2*(3*A + B + 3*B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(2*d^2*i^3*(c + d*x)^2) + (b^2*(b*c - a*d)*g^3*\text{Log}[(b*c - a*d)/(b*(c + d*x))]*(3*A + B + 3*B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(d^4*i^3) + (3*b^2*B*(b*c - a*d)*g^3*\text{PolyLog}[2, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i^3)$

**Rubi [A]** time = 0.73376, antiderivative size = 442, normalized size of antiderivative = 1.22, number of steps used = 22, number of rules used = 13, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.325$ , Rules used = {2528, 2486, 31, 2525, 12, 44, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{3b^2Bg^3(bc-ad)\text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{d^4i^3} - \frac{3b^2g^3(bc-ad)\log(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{d^4i^3} - \frac{3bg^3(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{d^4i^3(c+dx)}$$

Antiderivative was successfully verified.

[In] Int[((a\*g + b\*g\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(c\*i + d\*i\*x)^3, x]

[Out]  $(A*b^3*g^3*x)/(d^3*i^3) - (B*(b*c - a*d)^3*g^3)/(4*d^4*i^3*(c + d*x)^2) + (5*b*B*(b*c - a*d)^2*g^3)/(2*d^4*i^3*(c + d*x)) + (5*b^2*B*(b*c - a*d)*g^3*\text{Log}[a + b*x])/(2*d^4*i^3) + (b^2*B*g^3*(a + b*x)*\text{Log}[(e*(a + b*x))/(c + d*x)]/(d^3*i^3) + ((b*c - a*d)^3*g^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(2*d^4*i^3*(c + d*x)^2) - (3*b*(b*c - a*d)^2*g^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(d^4*i^3*(c + d*x)) - (7*b^2*B*(b*c - a*d)*g^3*\text{Log}[c + d*x])/(2*d^4*i^3) + (3*b^2*B*(b*c - a*d)*g^3*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/(d^4*i^3) - (3*b^2*(b*c - a*d)*g^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])*\text{Log}[c + d*x])/(d^4*i^3) - (3*b^2*B*(b*c - a*d)*g^3*\text{Log}[c + d*x]^2)/(2*d^4*i^3) + (3*b^2*B*(b*c - a*d)*g^3*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]/($

$d^4 i^3$ )

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFX^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFX, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q]^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

### Rule 31

```
Int[((a_) + (b_.)*(x_))^(n_), x_Symbol] := Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol]
:> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e,
Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol]
:> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

### Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol]
:> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n]))/g, x] - Dist[(b*e*n)/g,
Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol]
:> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]/(x_), x_Symbol]
:> -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(q_.), x_Symbol]
:> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_))^(n_.)]*(b_.)/(x_), x_Symbol]
:> Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rubi steps

$$\begin{aligned}
\int \frac{(ag + bgx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{(47c + 47dx)^3} dx &= \int \left( \frac{b^3 g^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{103823d^3} + \frac{(-bc + ad)^3 g^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{103823d^3(c + dx)^3} + \frac{3b(bc - ad)^2 g^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{103823d^3(c + dx)^2} \right) dx \\
&= \frac{(b^3 g^3) \int \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) dx}{103823d^3} - \frac{(3b^2(bc - ad)g^3) \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{c+dx} dx}{103823d^3} + \frac{3b(bc - ad)^2 g^3 \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{c+dx} dx}{103823d^3} \\
&= \frac{Ab^3 g^3 x}{103823d^3} + \frac{(bc - ad)^3 g^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{207646d^4(c + dx)^2} - \frac{3b(bc - ad)^2 g^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{103823d^4(c + dx)} \\
&= \frac{Ab^3 g^3 x}{103823d^3} + \frac{b^2 B g^3 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{103823d^3} + \frac{(bc - ad)^3 g^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{207646d^4(c + dx)^2} \\
&= \frac{Ab^3 g^3 x}{103823d^3} + \frac{b^2 B g^3 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{103823d^3} + \frac{(bc - ad)^3 g^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{207646d^4(c + dx)^2} \\
&= \frac{Ab^3 g^3 x}{103823d^3} - \frac{B(bc - ad)^3 g^3}{415292d^4(c + dx)^2} + \frac{5bB(bc - ad)^2 g^3}{207646d^4(c + dx)} + \frac{5b^2 B(bc - ad)g^3 \log \left( \frac{e(a+bx)}{c+dx} \right)}{207646d^4} \\
&= \frac{Ab^3 g^3 x}{103823d^3} - \frac{B(bc - ad)^3 g^3}{415292d^4(c + dx)^2} + \frac{5bB(bc - ad)^2 g^3}{207646d^4(c + dx)} + \frac{5b^2 B(bc - ad)g^3 \log \left( \frac{e(a+bx)}{c+dx} \right)}{207646d^4} \\
&= \frac{Ab^3 g^3 x}{103823d^3} - \frac{B(bc - ad)^3 g^3}{415292d^4(c + dx)^2} + \frac{5bB(bc - ad)^2 g^3}{207646d^4(c + dx)} + \frac{5b^2 B(bc - ad)g^3 \log \left( \frac{e(a+bx)}{c+dx} \right)}{207646d^4} \\
&= \frac{Ab^3 g^3 x}{103823d^3} - \frac{B(bc - ad)^3 g^3}{415292d^4(c + dx)^2} + \frac{5bB(bc - ad)^2 g^3}{207646d^4(c + dx)} + \frac{5b^2 B(bc - ad)g^3 \log \left( \frac{e(a+bx)}{c+dx} \right)}{207646d^4}
\end{aligned}$$

**Mathematica [A]** time = 0.466764, size = 317, normalized size = 0.88

$$g^3 \left( 6b^2 B(bc - ad) \left( 2 \text{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right) + \log(c + dx) \left( 2 \log \left( \frac{d(a+bx)}{ad-bc} \right) - \log(c + dx) \right) \right) - 12b^2(bc - ad) \log(c + dx) \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + \log(c + dx) \right) \right)$$

Antiderivative was successfully verified.

[In] Integrate[((a\*g + b\*g\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])))/(c\*i + d\*i\*x)^3,x]

```
[Out] (g^3*(4*A*b^3*d*x - (B*(b*c - a*d)^3)/(c + d*x)^2 + (10*b*B*(b*c - a*d)^2)/
(c + d*x) + 10*b^2*B*(b*c - a*d)*Log[a + b*x] + 4*b^2*B*d*(a + b*x)*Log[(e*
(a + b*x))/(c + d*x)] + (2*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)
]))/(c + d*x)^2 - (12*b*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))
/(c + d*x) - 14*b^2*B*(b*c - a*d)*Log[c + d*x] - 12*b^2*(b*c - a*d)*(A + B*
Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + 6*b^2*B*(b*c - a*d)*((2*Log[(d
*(a + b*x))/(-b*c) + a*d] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*
(c + d*x))/(b*c - a*d)])))/(4*d^4*i^3)
```

**Maple [B]** time = 0.157, size = 1815, normalized size = 5.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x)
```

```
[Out] -1/2/d*g^3/i^3*A/(d*x+c)^2*a^3+1/4/d*g^3/i^3*B/(d*x+c)^2*a^3+5/2/d^4*g^3/i^
3*A*b^3*c-9/4/d^4*g^3/i^3*B*b^3*c-5/2/d^3*g^3/i^3*A*b^2*a+6/d^3*g^3/i^3*B*b
^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*c*a+3/2/d^2*g^3/i^3*B*ln(b*e/d+(
a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^2*b*c+e/d^3*g^3/i^3*B*b^3*ln(b*e/d+(a*d-b
*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a-e/d^4*g^3/i^3*B*b^4*ln(b*e
/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c-3/2/d^3*g^3/i^3*B
*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a*b^2*c^2+e/d^4*g^3/i^3*B*b^4*ln
(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)/(d*x+c)*c^2-3/4
/d^2*g^3/i^3*B/(d*x+c)^2*a^2*b*c+6/d^3*g^3/i^3*A*b^2/(d*x+c)*a*c-5/d^3*g^3/
i^3*B*b^2/(d*x+c)*a*c+3/4/d^3*g^3/i^3*B/(d*x+c)^2*a*b^2*c^2+3/2/d^2*g^3/i^3
*A/(d*x+c)^2*a^2*b*c-3/d^2*g^3/i^3*B*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x
+c)*a^2+1/2/d^4*g^3/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*b^3*c^3
-3/d^3*g^3/i^3*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c
)*e/d/(d*x+c))-b*e)/b/e)*a-3/2/d^3*g^3/i^3*A/(d*x+c)^2*a*b^2*c^2+e/d^3*g^3/
i^3*A*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a+3/d^4*g^3/i^3*B*b^3*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*c-3/d^4*g
^3/i^3*B*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*c^2-e/d^4*g^3/i^3*A*b^
4/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c+9/4/d^3*g^3/i^3*B*b^2*a+e/d^2*g^3/i^3*B*b
^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)/(d*x+c)*a^
2-3/d^2*g^3/i^3*A*b/(d*x+c)*a^2+5/2/d^2*g^3/i^3*B*b/(d*x+c)*a^2-3/d^4*g^3/i
^3*A*b^3/(d*x+c)*c^2+1/2/d^4*g^3/i^3*A/(d*x+c)^2*b^3*c^3-3/d^3*g^3/i^3*B*b^
2*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a+3/d^4*g^3/i^3*B*b^3*d
ilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*c-3/d^3*g^3/i^3*A*b^2*ln(d
*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a+3/d^4*g^3/i^3*A*b^3*ln(d*(b*e/d+(a*d-
b*c)*e/d/(d*x+c))-b*e)*c-1/d^3*g^3/i^3*B*b^2*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x
```



$$+c)) - b * e) * a + 1/d^4 * g^3/i^3 * B * b^3 * \ln(d * (b * e/d + (a * d - b * c) * e/d / (d * x + c)) - b * e) * c - 5/2/d^3 * g^3/i^3 * B * b^2 * \ln(b * e/d + (a * d - b * c) * e/d / (d * x + c)) * a + 5/2/d^4 * g^3/i^3 * B * b^3 * \ln(b * e/d + (a * d - b * c) * e/d / (d * x + c)) * c + 5/2/d^4 * g^3/i^3 * B * b^3 / (d * x + c) * c^2 - 1/4/d^4 * g^3/i^3 * B / (d * x + c)^2 * b^3 * c^3 - 1/2/d * g^3/i^3 * B * \ln(b * e/d + (a * d - b * c) * e/d / (d * x + c)) / (d * x + c)^2 * a^3 - 2 * e/d^3 * g^3/i^3 * B * b^3 * \ln(b * e/d + (a * d - b * c) * e/d / (d * x + c)) / (d * e / (d * x + c) * a - e / (d * x + c) * b * c) / (d * x + c) * c * a$$

**Maxima [B]** time = 1.81583, size = 2750, normalized size = 7.62

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(d\*i\*x+c\*i)^3,x, algorithm="maxima")

[Out] 
$$-3/4 * B * a^2 * b * g^3 * (2 * (2 * d * x + c) * \log(b * e * x / (d * x + c) + a * e / (d * x + c)) / (d^4 * i^3 * x^2 + 2 * c * d^3 * i^3 * x + c^2 * d^2 * i^3) - (b * c^2 - 3 * a * c * d + 2 * (b * c * d - 2 * a * d^2) * x) / ((b * c * d^4 - a * d^5) * i^3 * x^2 + 2 * (b * c^2 * d^3 - a * c * d^4) * i^3 * x + (b * c^3 * d^2 - a * c^2 * d^3) * i^3) - 2 * (b^2 * c - 2 * a * b * d) * \log(b * x + a) / ((b^2 * c^2 * d^2 - 2 * a * b * c * d^3 + a^2 * d^4) * i^3) + 2 * (b^2 * c - 2 * a * b * d) * \log(d * x + c) / ((b^2 * c^2 * d^2 - 2 * a * b * c * d^3 + a^2 * d^4) * i^3)) - 1/2 * A * b^3 * g^3 * ((6 * c^2 * d * x + 5 * c^3) / (d^6 * i^3 * x^2 + 2 * c * d^5 * i^3 * x + c^2 * d^4 * i^3) - 2 * x / (d^3 * i^3) + 6 * c * \log(d * x + c) / (d^4 * i^3)) + 1/4 * B * a^3 * g^3 * ((2 * b * d * x + 3 * b * c - a * d) / ((b * c * d^3 - a * d^4) * i^3 * x^2 + 2 * (b * c^2 * d^2 - a * c * d^3) * i^3 * x + (b * c^3 * d - a * c^2 * d^2) * i^3) - 2 * \log(b * e * x / (d * x + c) + a * e / (d * x + c)) / (d^3 * i^3 * x^2 + 2 * c * d^2 * i^3 * x + c^2 * d * i^3) + 2 * b^2 * \log(b * x + a) / ((b^2 * c^2 * d - 2 * a * b * c * d^2 + a^2 * d^3) * i^3) - 2 * b^2 * \log(d * x + c) / ((b^2 * c^2 * d - 2 * a * b * c * d^2 + a^2 * d^3) * i^3)) + 3/2 * A * a * b^2 * g^3 * ((4 * c * d * x + 3 * c^2) / (d^5 * i^3 * x^2 + 2 * c * d^4 * i^3 * x + c^2 * d^3 * i^3) + 2 * \log(d * x + c) / (d^3 * i^3)) - 3/2 * (2 * d * x + c) * A * a^2 * b * g^3 / (d^4 * i^3 * x^2 + 2 * c * d^3 * i^3 * x + c^2 * d^2 * i^3) - 1/2 * A * a^3 * g^3 / (d^3 * i^3 * x^2 + 2 * c * d^2 * i^3 * x + c^2 * d * i^3) + 1/2 * (6 * a^3 * b^2 * d^3 * g^3 * \log(e) - (6 * g^3 * \log(e) + 7 * g^3) * b^5 * c^3 + (18 * g^3 * \log(e) + 19 * g^3) * a * b^4 * c^2 * d - 2 * (9 * g^3 * \log(e) + 7 * g^3) * a^2 * b^3 * c * d^2) * B * \log(d * x + c) / (b^2 * c^2 * d^4 * i^3 - 2 * a * b * c * d^5 * i^3 + a^2 * d^6 * i^3) + 1/4 * (4 * (b^5 * c^2 * d^3 * g^3 * \log(e) - 2 * a * b^4 * c * d^4 * g^3 * \log(e) + a^2 * b^3 * d^5 * g^3 * \log(e)) * B * x^3 + 8 * (b^5 * c^3 * d^2 * g^3 * \log(e) - 2 * a * b^4 * c^2 * d^3 * g^3 * \log(e) + a^2 * b^3 * c * d^4 * g^3 * \log(e)) * B * x^2 - 2 * ((4 * g^3 * \log(e) - 5 * g^3) * b^5 * c^4 * d - 20 * (g^3 * \log(e) - g^3) * a * b^4 * c^3 * d^2 + (28 * g^3 * \log(e) - 27 * g^3) * a^2 * b^3 * c^2 * d^3 - 12 * (g^3 * \log(e) - g^3) * a^3 * b^2 * c * d^4) * B * x + 6 * ((b^5 * c^3 * d^2 * g^3 - 3 * a * b^4 * c^2 * d^3 * g^3 + 3 * a^2 * b^3 * c * d^4 * g^3 - a^3 * b^2 * d^5 * g^3) * B * x^2 + 2 * (b^5 * c^4 * d * g^3 - 3 * a * b^4 * c^3 * d^2 * g^3 + 3 * a^2 * b^3 * c^2 * d^3 * g^3 - a^3 * b^2 * c * d^4 * g^3) * B * x + (b^5 * c^5 * g^3 - 3 * a * b^4 * c^4 * d * g^3 + 3 * a^2 * b^3 * c^3 * d^2 * g^3 - a^3 * b^2 * c^2 * d^3 * g^3) * B) * \log(d * x + c)^2$$

$$\begin{aligned}
& - ((10*g^3*\log(e) - 9*g^3)*b^5*c^5 - (38*g^3*\log(e) - 35*g^3)*a*b^4*c^4*d + \\
& (46*g^3*\log(e) - 47*g^3)*a^2*b^3*c^3*d^2 - 3*(6*g^3*\log(e) - 7*g^3)*a^3*b^2*c^2*d^3)*B + 2*(2*(b^5*c^2*d^3*g^3 - 2*a*b^4*c*d^4*g^3 + a^2*b^3*d^5*g^3) \\
& *B*x^3 + (9*b^5*c^3*d^2*g^3 - 21*a*b^4*c^2*d^3*g^3 + 12*a^2*b^3*c*d^4*g^3 + 2*a^3*b^2*d^5*g^3)*B*x^2 + 2*(3*b^5*c^4*d*g^3 - 3*a*b^4*c^3*d^2*g^3 - 6*a^2*b^3*c^2*d^3*g^3 + 8*a^3*b^2*c*d^4*g^3)*B*x + (6*a*b^4*c^4*d*g^3 - 15*a^2*b^3*c^3*d^2*g^3 + 11*a^3*b^2*c^2*d^3*g^3)*B)*\log(b*x + a) - 2*(2*(b^5*c^2*d^3*g^3 - 2*a*b^4*c*d^4*g^3 + a^2*b^3*d^5*g^3)*B*x^3 + 4*(b^5*c^3*d^2*g^3 - 2*a*b^4*c^2*d^3*g^3 + a^2*b^3*c*d^4*g^3)*B*x^2 - 4*(b^5*c^4*d*g^3 - 5*a*b^4*c^3*d^2*g^3 + 7*a^2*b^3*c^2*d^3*g^3 - 3*a^3*b^2*c*d^4*g^3)*B*x - (5*b^5*c^5*g^3 - 19*a*b^4*c^4*d*g^3 + 23*a^2*b^3*c^3*d^2*g^3 - 9*a^3*b^2*c^2*d^3*g^3)*B)*\log(d*x + c))/(b^2*c^4*d^4*i^3 - 2*a*b*c^3*d^5*i^3 + a^2*c^2*d^6*i^3 + (b^2*c^2*d^6*i^3 - 2*a*b*c*d^7*i^3 + a^2*d^8*i^3)*x^2 + 2*(b^2*c^3*d^5*i^3 - 2*a*b*c^2*d^6*i^3 + a^2*c*d^7*i^3)*x) - 3*(b^3*c*g^3 - a*b^2*d*g^3)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B/(d^4*i^3)
\end{aligned}$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{Ab^3g^3x^3 + 3Aab^2g^3x^2 + 3Aa^2bg^3x + Aa^3g^3 + (Bb^3g^3x^3 + 3Bab^2g^3x^2 + 3Ba^2bg^3x + Ba^3g^3) \log\left(\frac{bex+ae}{dx+c}\right)}{d^3i^3x^3 + 3cd^2i^3x^2 + 3c^2di^3x + c^3i^3}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x, algorith="fricas")
```

```
[Out] integral((A*b^3*g^3*x^3 + 3*A*a*b^2*g^3*x^2 + 3*A*a^2*b*g^3*x + A*a^3*g^3 + (B*b^3*g^3*x^3 + 3*B*a*b^2*g^3*x^2 + 3*B*a^2*b*g^3*x + B*a^3*g^3)*log((b*e*x + a*e)/(d*x + c)))/(d^3*i^3*x^3 + 3*c*d^2*i^3*x^2 + 3*c^2*d*i^3*x + c^3*i^3), x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)**3,x)
```

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^3 \left( B \log\left(\frac{(bx+a)e}{dx+c}\right) + A \right)}{(dix + ci)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(d\*i\*x+c\*i)^3,x, algorithm="giac")

[Out] integrate((b\*g\*x + a\*g)^3\*(B\*log((b\*x + a)\*e/(d\*x + c)) + A)/(d\*i\*x + c\*i)^3, x)

$$3.48 \quad \int \frac{(ag+bgx)^2 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{(ci+dix)^3} dx$$

**Optimal.** Leaf size=251

$$\frac{b^2 B g^2 \text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)}{d^3 i^3} - \frac{b^2 g^2 \log\left(\frac{bc-ad}{b(c+dx)}\right) \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{d^3 i^3} - \frac{g^2 (a+bx)^2 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{2 d i^3 (c+dx)^2} - \frac{A b g^2 (a+bx)}{d^2 i^3 (c+dx)}$$

[Out] (B\*g^2\*(a + b\*x)^2)/(4\*d\*i^3\*(c + d\*x)^2) - (A\*b\*g^2\*(a + b\*x))/(d^2\*i^3\*(c + d\*x)) + (b\*B\*g^2\*(a + b\*x))/(d^2\*i^3\*(c + d\*x)) - (b\*B\*g^2\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x)])/(d^2\*i^3\*(c + d\*x)) - (g^2\*(a + b\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(2\*d\*i^3\*(c + d\*x)^2) - (b^2\*g^2\*Log[(b\*c - a\*d)/(b\*(c + d\*x))]\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(d^3\*i^3) - (b^2\*B\*g^2\*PolyLog[2, (d\*(a + b\*x))/(b\*(c + d\*x))])/(d^3\*i^3)

**Rubi [A]** time = 0.607139, antiderivative size = 340, normalized size of antiderivative = 1.35, number of steps used = 19, number of rules used = 11, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.275$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{b^2 B g^2 \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{d^3 i^3} + \frac{b^2 g^2 \log(c+dx) \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{d^3 i^3} + \frac{2 b g^2 (bc-ad) \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{d^3 i^3 (c+dx)} - \frac{g^2 (bc-ad)}{2}$$

Antiderivative was successfully verified.

[In] Int[((a\*g + b\*g\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(c\*i + d\*i\*x)^3, x]

[Out] (B\*(b\*c - a\*d)^2\*g^2)/(4\*d^3\*i^3\*(c + d\*x)^2) - (3\*b\*B\*(b\*c - a\*d)\*g^2)/(2\*d^3\*i^3\*(c + d\*x)) - (3\*b^2\*B\*g^2\*Log[a + b\*x])/(2\*d^3\*i^3) - ((b\*c - a\*d)^2\*g^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(2\*d^3\*i^3\*(c + d\*x)^2) + (2\*b\*(b\*c - a\*d)\*g^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(d^3\*i^3\*(c + d\*x)) + (3\*b^2\*B\*g^2\*Log[c + d\*x])/(2\*d^3\*i^3) - (b^2\*B\*g^2\*Log[-((d\*(a + b\*x))/(b\*c - a\*d))]\*Log[c + d\*x])/(d^3\*i^3) + (b^2\*g^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])\*Log[c + d\*x])/(d^3\*i^3) + (b^2\*B\*g^2\*Log[c + d\*x]^2)/(2\*d^3\*i^3) - (b^2\*B\*g^2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)]/(d^3\*i^3)

**Rule 2528**

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*(RGx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u

]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

### Rule 2525

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*((d\_.) + (e\_.)\*(x\_))^(m\_.), x\_Symbol] := Simp[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^n)/(e\*(m + 1)), x] - Dist[(b\*n\*p)/(e\*(m + 1)), Int[SimplifyIntegrand[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

### Rule 12

Int[(a\_)\*(u\_), x\_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b\_)\*(v\_)] /; FreeQ[b, x]

### Rule 44

Int[((a\_) + (b\_.)\*(x\_))^(m\_.)\*((c\_.) + (d\_.)\*(x\_))^(n\_.), x\_Symbol] := Int[ExpandIntegrand[(a + b\*x)^m\*(c + d\*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b\*c - a\*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])

### Rule 2524

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^n)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

### Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*(RFx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]

### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]*(b_.))^(p_.)*((f_) + (g_.
)*(x_)^(q_.)), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{(ag + bgx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{(48c + 48dx)^3} dx &= \int \left( \frac{(-bc + ad)^2 g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{110592d^2(c + dx)^3} - \frac{b(bc - ad)g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{55296d^2(c + dx)^2} \right) dx \\
&= \frac{(b^2 g^2) \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{c+dx} dx}{110592d^2} - \frac{(b(bc - ad)g^2) \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{(c+dx)^2} dx}{55296d^2} + \frac{((bc - ad)^2 g^2) \int \frac{1}{c+dx} dx}{55296d^2} \\
&= -\frac{(bc - ad)^2 g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{221184d^3(c + dx)^2} + \frac{b(bc - ad)g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{55296d^3(c + dx)} + \frac{b^2 g^2 \log(c + dx)}{55296d^3} \\
&= -\frac{(bc - ad)^2 g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{221184d^3(c + dx)^2} + \frac{b(bc - ad)g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{55296d^3(c + dx)} + \frac{b^2 g^2 \log(c + dx)}{55296d^3} \\
&= -\frac{(bc - ad)^2 g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{221184d^3(c + dx)^2} + \frac{b(bc - ad)g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{55296d^3(c + dx)} + \frac{b^2 g^2 \log(c + dx)}{55296d^3} \\
&= \frac{B(bc - ad)^2 g^2}{442368d^3(c + dx)^2} - \frac{bB(bc - ad)g^2}{73728d^3(c + dx)} - \frac{b^2 Bg^2 \log(a + bx)}{73728d^3} - \frac{(bc - ad)^2 g^2 \log(c + dx)}{221184d^3} \\
&= \frac{B(bc - ad)^2 g^2}{442368d^3(c + dx)^2} - \frac{bB(bc - ad)g^2}{73728d^3(c + dx)} - \frac{b^2 Bg^2 \log(a + bx)}{73728d^3} - \frac{(bc - ad)^2 g^2 \log(c + dx)}{221184d^3} \\
&= \frac{B(bc - ad)^2 g^2}{442368d^3(c + dx)^2} - \frac{bB(bc - ad)g^2}{73728d^3(c + dx)} - \frac{b^2 Bg^2 \log(a + bx)}{73728d^3} - \frac{(bc - ad)^2 g^2 \log(c + dx)}{221184d^3} \\
&= \frac{B(bc - ad)^2 g^2}{442368d^3(c + dx)^2} - \frac{bB(bc - ad)g^2}{73728d^3(c + dx)} - \frac{b^2 Bg^2 \log(a + bx)}{73728d^3} - \frac{(bc - ad)^2 g^2 \log(c + dx)}{221184d^3}
\end{aligned}$$

**Mathematica [A]** time = 0.330219, size = 245, normalized size = 0.98

$$\frac{g^2 \left( -2b^2 B \left( 2 \text{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right) + \log(c + dx) \left( 2 \log \left( \frac{d(a+bx)}{ad-bc} \right) - \log(c + dx) \right) \right) + 4b^2 \log(c + dx) \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right) \right)}{4d^3 i^3}$$

Antiderivative was successfully verified.

[In] Integrate[((a\*g + b\*g\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])/(c\*i + d\*i\*x)^3,x]

```
[Out] (g^2*((B*(b*c - a*d)^2)/(c + d*x)^2 - (6*b*B*(b*c - a*d))/(c + d*x) - 6*b^2
*B*Log[a + b*x] - (2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x])))/(c
+ d*x)^2 + (8*b*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x])))/(c + d*x
) + 6*b^2*B*Log[c + d*x] + 4*b^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c
+ d*x] - 2*b^2*B*((2*Log[(d*(a + b*x))/(-b*c) + a*d] - Log[c + d*x])*Log
[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(4*d^3*i^3)
```

**Maple [B]** time = 0.056, size = 1569, normalized size = 6.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x)
```

```
[Out] 1/4*g^2/(a*d-b*c)/i^3*B/(d*x+c)^2*a^3-1/2*g^2/(a*d-b*c)/i^3*A/(d*x+c)^2*a^3
-1/2*g^2/(a*d-b*c)/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^3-3/d^
2*g^2/(a*d-b*c)/i^3*B*b^2/(d*x+c)*a*c-3/4/d*g^2/(a*d-b*c)/i^3*B/(d*x+c)^2*a
^2*b*c+3/4/d^2*g^2/(a*d-b*c)/i^3*B/(d*x+c)^2*a*b^2*c^2+4/d^2*g^2/(a*d-b*c)/
i^3*A*b^2/(d*x+c)*a*c-3/2/d^2*g^2/(a*d-b*c)/i^3*A/(d*x+c)^2*a*b^2*c^2-2/d^3
*g^2/(a*d-b*c)/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3/(d*x+c)*c^2+1/2/d^
3*g^2/(a*d-b*c)/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*b^3*c^3+1/d
^3*g^2/(a*d-b*c)/i^3*A*b^3*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c+3/2/d*
g^2/(a*d-b*c)/i^3*B*b/(d*x+c)*a^2-2/d*g^2/(a*d-b*c)/i^3*A*b/(d*x+c)*a^2-2/d
*g^2/(a*d-b*c)/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b/(d*x+c)*a^2+1/d^3*g^
2/(a*d-b*c)/i^3*B*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*
c)*e/d/(d*x+c))-b*e)/b/e)*c-2/d^3*g^2/(a*d-b*c)/i^3*A*b^3/(d*x+c)*c^2+1/2/d
^3*g^2/(a*d-b*c)/i^3*A/(d*x+c)^2*b^3*c^3+5/4/d^2*g^2/(a*d-b*c)/i^3*B*b^2*a
5/4/d^3*g^2/(a*d-b*c)/i^3*B*b^3*c-3/2/d^2*g^2/(a*d-b*c)/i^3*B*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))*b^2*a-1/d^2*g^2/(a*d-b*c)/i^3*B*b^2*ln(b*e/d+(a*d-b*c)*e
/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a+3/2/d*g^2/(a*d
-b*c)/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^2*b*c+4/d^2*g^2/(a
*d-b*c)/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2/(d*x+c)*a*c-3/2/d^2*g^2/(a
*d-b*c)/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a*b^2*c^2+3/2/d^3*g
^2/(a*d-b*c)/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3*c-1/d^2*g^2/(a*d-b*c
)/i^3*A*b^2*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a-1/d^2*g^2/(a*d-b*c)/i
^3*B*b^2*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a+1/d^3*g^2/(a*d
-b*c)/i^3*B*b^3*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*c-1/4/d^3
*g^2/(a*d-b*c)/i^3*B/(d*x+c)^2*b^3*c^3+3/2/d*g^2/(a*d-b*c)/i^3*A/(d*x+c)^2*
a^2*b*c+3/2/d^3*g^2/(a*d-b*c)/i^3*B*b^3/(d*x+c)*c^2-3/2/d^2*g^2/(a*d-b*c)/i
^3*A*b^2*a+3/2/d^3*g^2/(a*d-b*c)/i^3*A*b^3*c
```



---

**Maxima [F]** time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(d\*i\*x+c\*i)^3,x, algorithm="maxima")

[Out] 
$$-1/2*B*a*b*g^2*(2*(2*d*x + c)*\log(b*e*x/(d*x + c) + a*e/(d*x + c))/(d^4*i^3*x^2 + 2*c*d^3*i^3*x + c^2*d^2*i^3) - (b*c^2 - 3*a*c*d + 2*(b*c*d - 2*a*d^2)*x)/((b*c*d^4 - a*d^5)*i^3*x^2 + 2*(b*c^2*d^3 - a*c*d^4)*i^3*x + (b*c^3*d^2 - a*c^2*d^3)*i^3) - 2*(b^2*c - 2*a*b*d)*\log(b*x + a)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*i^3) + 2*(b^2*c - 2*a*b*d)*\log(d*x + c)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*i^3)) + 1/4*B*a^2*g^2*((2*b*d*x + 3*b*c - a*d)/((b*c*d^3 - a*d^4)*i^3*x^2 + 2*(b*c^2*d^2 - a*c*d^3)*i^3*x + (b*c^3*d - a*c^2*d^2)*i^3) - 2*\log(b*e*x/(d*x + c) + a*e/(d*x + c))/(d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3) + 2*b^2*\log(b*x + a)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3) - 2*b^2*\log(d*x + c)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3)) + 1/2*A*b^2*g^2*((4*c*d*x + 3*c^2)/(d^5*i^3*x^2 + 2*c*d^4*i^3*x + c^2*d^3*i^3) + 2*\log(d*x + c)/(d^3*i^3)) - 1/2*B*b^2*g^2*((d^2*x^2 + 2*c*d*x + c^2)*\log(d*x + c)^2 + (4*c*d*x + 3*c^2)*\log(d*x + c))/(d^5*i^3*x^2 + 2*c*d^4*i^3*x + c^2*d^3*i^3) - 2*\integrate(1/2*(2*d^2*x^2*\log(b*x + a) + 2*d^2*x^2*\log(e) + 4*c*d*x + 3*c^2)/(d^5*i^3*x^3 + 3*c*d^4*i^3*x^2 + 3*c^2*d^3*i^3*x + c^3*d^2*i^3), x) - (2*d*x + c)*A*a*b*g^2/(d^4*i^3*x^2 + 2*c*d^3*i^3*x + c^2*d^2*i^3) - 1/2*A*a^2*g^2/(d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3)$$

---

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\int \left( \frac{Ab^2g^2x^2 + 2Aabg^2x + Aa^2g^2 + (Bb^2g^2x^2 + 2Babg^2x + Ba^2g^2) \log\left(\frac{bex+ae}{dx+c}\right)}{d^3i^3x^3 + 3cd^2i^3x^2 + 3c^2di^3x + c^3i^3}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(d\*i\*x+c\*i)^3,x, algorithm="fricas")

[Out] integral((A\*b^2\*g^2\*x^2 + 2\*A\*a\*b\*g^2\*x + A\*a^2\*g^2 + (B\*b^2\*g^2\*x^2 + 2\*B\*a\*b\*g^2\*x + B\*a^2\*g^2)\*log((b\*e\*x + a\*e)/(d\*x + c)))/(d^3\*i^3\*x^3 + 3\*c\*d^2

$*i^3*x^2 + 3*c^2*d*i^3*x + c^3*i^3), x)$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*\*2\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))/(d\*i\*x+c\*i)\*\*3,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^2 \left( B \log \left( \frac{(bx+a)e}{dx+c} \right) + A \right)}{(dix + ci)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(d\*i\*x+c\*i)^3,x, algorithm="giac")

[Out] integrate((b\*g\*x + a\*g)^2\*(B\*log((b\*x + a)\*e/(d\*x + c)) + A)/(d\*i\*x + c\*i)^3, x)

$$3.49 \quad \int \frac{(ag+bgx)\left(A+B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(ci+dx)^3} dx$$

**Optimal.** Leaf size=85

$$\frac{g(a+bx)^2\left(B \log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2i^3(c+dx)^2(bc-ad)} - \frac{Bg(a+bx)^2}{4i^3(c+dx)^2(bc-ad)}$$

[Out]  $-(B*g*(a+b*x)^2)/(4*(b*c-a*d)*i^3*(c+d*x)^2) + (g*(a+b*x)^2*(A+B*\text{Log}[(e*(a+b*x))/(c+d*x)]))/(2*(b*c-a*d)*i^3*(c+d*x)^2)$

**Rubi [B]** time = 0.292345, antiderivative size = 191, normalized size of antiderivative = 2.25, number of steps used = 10, number of rules used = 4, integrand size = 38,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.105$ , Rules used = {2528, 2525, 12, 44}

$$-\frac{bg\left(B \log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^2i^3(c+dx)} + \frac{g(bc-ad)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2d^2i^3(c+dx)^2} + \frac{b^2Bg \log(a+bx)}{2d^2i^3(bc-ad)} - \frac{b^2Bg \log(c+dx)}{2d^2i^3(bc-ad)} - \frac{Bg(bc-ad)}{4d^2i^3(c+dx)^2} +$$

Antiderivative was successfully verified.

[In]  $\text{Int}[(a*g + b*g*x)*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])/(c*i + d*i*x)^3, x]$

[Out]  $-(B*(b*c - a*d)*g)/(4*d^2*i^3*(c + d*x)^2) + (b*B*g)/(2*d^2*i^3*(c + d*x)) + (b^2*B*g*\text{Log}[a + b*x])/(2*d^2*(b*c - a*d)*i^3) + ((b*c - a*d)*g*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(2*d^2*i^3*(c + d*x)^2) - (b*g*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(d^2*i^3*(c + d*x)) - (b^2*B*g*\text{Log}[c + d*x])/(2*d^2*(b*c - a*d)*i^3)$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*
```

```
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

### Rubi steps

$$\begin{aligned}
\int \frac{(ag + bgx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{(49c + 49dx)^3} dx &= \int \left( \frac{(-bc + ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{117649d(c + dx)^3} + \frac{bg \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{117649d(c + dx)^2} \right) dx \\
&= \frac{(bg) \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{(c+dx)^2} dx}{117649d} - \frac{((bc - ad)g) \int \frac{A+B \log \left( \frac{e(a+bx)}{c+dx} \right)}{(c+dx)^3} dx}{117649d} \\
&= \frac{(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{235298d^2(c + dx)^2} - \frac{bg \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{117649d^2(c + dx)} + \frac{(bBg) \int \frac{bc-ad}{(a+bx)(c+dx)} dx}{117649d^2} \\
&= \frac{(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{235298d^2(c + dx)^2} - \frac{bg \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{117649d^2(c + dx)} + \frac{(bB(bc - ad)g) \int \frac{1}{c+dx} dx}{117649d^2} \\
&= \frac{(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{235298d^2(c + dx)^2} - \frac{bg \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{117649d^2(c + dx)} + \frac{(bB(bc - ad)g) \int \frac{1}{c+dx} dx}{117649d^2} \\
&= -\frac{B(bc - ad)g}{470596d^2(c + dx)^2} + \frac{bBg}{235298d^2(c + dx)} + \frac{b^2Bg \log(a + bx)}{235298d^2(bc - ad)} + \frac{(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{235298d^2}
\end{aligned}$$

**Mathematica [B]** time = 0.151509, size = 207, normalized size = 2.44

$$\frac{g \left( -\frac{b \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{d^2(c+dx)} + \frac{(bc-ad) \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{2d^2(c+dx)^2} - \frac{B \left( \frac{2b^2 \log(a+bx)}{bc-ad} - \frac{2b^2 \log(c+dx)}{bc-ad} + \frac{bc-ad}{(c+dx)^2} + \frac{2b}{c+dx} \right)}{4d^2} + \frac{bB \left( \frac{b \log(a+bx)}{bc-ad} - \frac{b \log(c+dx)}{bc-ad} + \frac{1}{c+dx} \right)}{d^2} \right)}{i^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c*i + d*i*x)^3,x]
```

```
[Out] (g*(((b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*d^2*(c + d*x)^2) - (b*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^2*(c + d*x)) + (b*B*((c + d*x)^(-1) + (b*Log[a + b*x])/(b*c - a*d) - (b*Log[c + d*x])/(b*c - a*d))/d^2 - (B*((b*c - a*d)/(c + d*x)^2 + (2*b)/(c + d*x) + (2*b^2*Log[a + b*x])/(b*c - a*d) - (2*b^2*Log[c + d*x])/(b*c - a*d)))/(4*d^2)))/i^3
```

**Maple [B]** time = 0.05, size = 1049, normalized size = 12.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x)
```

```
[Out] 1/4/d*g/(a*d-b*c)^2/i^3*B*b^2*a-1/4/d^2*g/(a*d-b*c)^2/i^3*B*b^3*c+1/2/d^2*g/(a*d-b*c)^2/i^3*A*b^3*c-1/2/d*g/(a*d-b*c)^2/i^3*A*b^2*a+3/2*g/(a*d-b*c)^2/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^2*b*c+1/2/d^2*g/(a*d-b*c)^2/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*b^3*c^3+1/4*d*g/(a*d-b*c)^2/i^3*B/(d*x+c)^2*a^3-1/2*d*g/(a*d-b*c)^2/i^3*A/(d*x+c)^2*a^3-g/(a*d-b*c)^2/i^3*A*b/(d*x+c)*a^2+1/2*g/(a*d-b*c)^2/i^3*B*b/(d*x+c)*a^2-g/(a*d-b*c)^2/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b/(d*x+c)*a^2+1/2/d^2*g/(a*d-b*c)^2/i^3*B*b^3/(d*x+c)*c^2-1/2/d*g/(a*d-b*c)^2/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*a-1/4/d^2*g/(a*d-b*c)^2/i^3*B/(d*x+c)^2*b^3*c^3+3/2*g/(a*d-b*c)^2/i^3*A/(d*x+c)^2*a^2*b*c+1/2/d^2*g/(a*d-b*c)^2/i^3*A/(d*x+c)^2*b^3*c^3+1/2/d^2*g/(a*d-b*c)^2/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3*c-1/2*d*g/(a*d-b*c)^2/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^3-1/d^2*g/(a*d-b*c)^2/i^3*A*b^3/(d*x+c)*c^2-3/4*g/(a*d-b*c)^2/i^3*B/(d*x+c)^2*a^2*b*c-1/d^2*g/(a*d-b*c)^2/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3/(d*x+c)*c^2-1/d*g/(a*d-b*c)^2/i^3*B*b^2/(d*x+c)*a*c+3/4/d*g/(a*d-b*c)^2/i^3*B/(d*x+c)^2*a*b^2*c^2+2/d*g/(a*d-b*c)^2/i^3*A*b^2/(d*x+c)*a*c-3/2/d*g/(a*d-b*c)^2/i^3*A/(d*x+c)^2*a*b^2*c^2+2/d*g/(a*d-b*c)^2/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2/(d*x+c)*a*c-3/2/d*g/(a*d-b*c)^2/i^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a*b^2*c^2
```

**Maxima [B]** time = 1.25232, size = 765, normalized size = 9.

$$-\frac{1}{4} B b g \left( \frac{2(2dx+c) \log\left(\frac{bex}{dx+c} + \frac{ae}{dx+c}\right)}{d^4 i^3 x^2 + 2cd^3 i^3 x + c^2 d^2 i^3} - \frac{bc^2 - 3acd + 2(bcd - 2ad^2)x}{(bcd^4 - ad^5)i^3 x^2 + 2(bc^2 d^3 - acd^4)i^3 x + (bc^3 d^2 - ac^2 d^3)i^3} - \frac{2(b^2c - 2abd) \log\left(\frac{bex}{dx+c} + \frac{ae}{dx+c}\right)}{(b^2c^2 d^2 - 2abcd^3)i^3} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(d\*i\*x+c\*i)^3,x, algorithm="maxima")

[Out] 
$$-1/4*B*b*g*(2*(2*d*x + c)*\log(b*e*x/(d*x + c) + a*e/(d*x + c))/(d^4*i^3*x^2 + 2*c*d^3*i^3*x + c^2*d^2*i^3) - (b*c^2 - 3*a*c*d + 2*(b*c*d - 2*a*d^2)*x)/((b*c*d^4 - a*d^5)*i^3*x^2 + 2*(b*c^2*d^3 - a*c*d^4)*i^3*x + (b*c^3*d^2 - a*c^2*d^3)*i^3) - 2*(b^2*c - 2*a*b*d)*\log(b*x + a)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*i^3) + 2*(b^2*c - 2*a*b*d)*\log(d*x + c)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*i^3) + 1/4*B*a*g*((2*b*d*x + 3*b*c - a*d)/((b*c*d^3 - a*d^4)*i^3*x^2 + 2*(b*c^2*d^2 - a*c*d^3)*i^3*x + (b*c^3*d - a*c^2*d^2)*i^3) - 2*\log(b*e*x/(d*x + c) + a*e/(d*x + c))/(d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3) + 2*b^2*\log(b*x + a)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3) - 2*b^2*\log(d*x + c)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3) - 1/2*(2*d*x + c)*A*b*g/(d^4*i^3*x^2 + 2*c*d^3*i^3*x + c^2*d^2*i^3) - 1/2*A*a*g/(d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3)$$

**Fricas [B]** time = 0.476337, size = 366, normalized size = 4.31

$$\frac{2((2A-B)b^2cd - (2A-B)abd^2)gx + ((2A-B)b^2c^2 - (2A-B)a^2d^2)g - 2(Bb^2d^2gx^2 + 2Babd^2gx + Ba^2d^2g) \log\left(\frac{bex}{dx+c} + \frac{ae}{dx+c}\right)}{4((bcd^4 - ad^5)i^3x^2 + 2(bc^2d^3 - acd^4)i^3x + (bc^3d^2 - ac^2d^3)i^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(d\*i\*x+c\*i)^3,x, algorithm="fricas")

[Out] 
$$-1/4*(2*((2*A - B)*b^2*c*d - (2*A - B)*a*b*d^2)*g*x + ((2*A - B)*b^2*c^2 - (2*A - B)*a^2*d^2)*g - 2*(B*b^2*d^2*g*x^2 + 2*B*a*b*d^2*g*x + B*a^2*d^2*g)*\log((b*e*x + a*e)/(d*x + c)))/((b*c*d^4 - a*d^5)*i^3*x^2 + 2*(b*c^2*d^3 - a*c*d^4)*i^3*x + (b*c^3*d^2 - a*c^2*d^3)*i^3)$$

**Sympy [B]** time = 6.02962, size = 382, normalized size = 4.49

$$\frac{Bb^2g \log\left(x + \frac{-\frac{Ba^2b^2d^2g}{ad-bc} + \frac{2Bab^3cdg}{ad-bc} + Bab^2dg - \frac{Bb^4c^2g}{ad-bc} + Bb^3cg}{2Bb^3dg}\right)}{2d^2i^3(ad-bc)} - \frac{Bb^2g \log\left(x + \frac{\frac{Ba^2b^2d^2g}{ad-bc} - \frac{2Bab^3cdg}{ad-bc} + Bab^2dg + \frac{Bb^4c^2g}{ad-bc} + Bb^3cg}{2Bb^3dg}\right)}{2d^2i^3(ad-bc)} - \frac{2Aadg + 2Ab}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))/(d\*i\*x+c\*i)\*\*3,x)

[Out] B\*b\*\*2\*g\*log(x + (-B\*a\*\*2\*b\*\*2\*d\*\*2\*g/(a\*d - b\*c) + 2\*B\*a\*b\*\*3\*c\*d\*g/(a\*d - b\*c) + B\*a\*b\*\*2\*d\*g - B\*b\*\*4\*c\*\*2\*g/(a\*d - b\*c) + B\*b\*\*3\*c\*g)/(2\*B\*b\*\*3\*d\*g))/(2\*d\*\*2\*i\*\*3\*(a\*d - b\*c)) - B\*b\*\*2\*g\*log(x + (B\*a\*\*2\*b\*\*2\*d\*\*2\*g/(a\*d - b\*c) - 2\*B\*a\*b\*\*3\*c\*d\*g/(a\*d - b\*c) + B\*a\*b\*\*2\*d\*g + B\*b\*\*4\*c\*\*2\*g/(a\*d - b\*c) + B\*b\*\*3\*c\*g)/(2\*B\*b\*\*3\*d\*g))/(2\*d\*\*2\*i\*\*3\*(a\*d - b\*c)) - (2\*A\*a\*d\*g + 2\*A\*b\*c\*g - B\*a\*d\*g - B\*b\*c\*g + x\*(4\*A\*b\*d\*g - 2\*B\*b\*d\*g))/(4\*c\*\*2\*d\*\*2\*i\*\*3 + 8\*c\*d\*\*3\*i\*\*3\*x + 4\*d\*\*4\*i\*\*3\*x\*\*2) + (-B\*a\*d\*g - B\*b\*c\*g - 2\*B\*b\*d\*g\*x)\*log(e\*(a + b\*x)/(c + d\*x))/(2\*c\*\*2\*d\*\*2\*i\*\*3 + 4\*c\*d\*\*3\*i\*\*3\*x + 2\*d\*\*4\*i\*\*3\*x\*\*2)

**Giac [B]** time = 1.38173, size = 258, normalized size = 3.04

$$-\frac{Bb^2g \log(bx + a)}{2(bcd^2i - ad^3i)} + \frac{Bb^2g \log(dx + c)}{2(bcd^2i - ad^3i)} - \frac{(2Bbdgix + Bbcgi + Badgi) \log\left(\frac{bx+a}{dx+c}\right)}{2(d^4x^2 + 2cd^3x + c^2d^2)} - \frac{4Abdgix + 2Bbdgix + 2Abcgi + B}{4(d^4x^2 + 2cd^3x + c^2d^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(d\*i\*x+c\*i)^3,x, algorithm="giac")

[Out] -1/2\*B\*b^2\*g\*log(b\*x + a)/(b\*c\*d^2\*i - a\*d^3\*i) + 1/2\*B\*b^2\*g\*log(d\*x + c)/(b\*c\*d^2\*i - a\*d^3\*i) - 1/2\*(2\*B\*b\*d\*g\*i\*x + B\*b\*c\*g\*i + B\*a\*d\*g\*i)\*log((b\*x + a)/(d\*x + c))/(d^4\*x^2 + 2\*c\*d^3\*x + c^2\*d^2) - 1/4\*(4\*A\*b\*d\*g\*i\*x + 2\*B\*b\*d\*g\*i\*x + 2\*A\*b\*c\*g\*i + B\*b\*c\*g\*i + 2\*A\*a\*d\*g\*i + B\*a\*d\*g\*i)/(d^4\*x^2 + 2\*c\*d^3\*x + c^2\*d^2)

$$3.50 \quad \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(ci+dx)^3} dx$$

**Optimal.** Leaf size=144

$$-\frac{B \log\left(\frac{e(a+bx)}{c+dx}\right) + A}{2di^3(c+dx)^2} + \frac{b^2B \log(a+bx)}{2di^3(bc-ad)^2} - \frac{b^2B \log(c+dx)}{2di^3(bc-ad)^2} + \frac{bB}{2di^3(c+dx)(bc-ad)} + \frac{B}{4di^3(c+dx)^2}$$

[Out] B/(4\*d\*i^3\*(c + d\*x)^2) + (b\*B)/(2\*d\*(b\*c - a\*d)\*i^3\*(c + d\*x)) + (b^2\*B\*Log[a + b\*x])/(2\*d\*(b\*c - a\*d)^2\*i^3) - (A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])/(2\*d\*i^3\*(c + d\*x)^2) - (b^2\*B\*Log[c + d\*x])/(2\*d\*(b\*c - a\*d)^2\*i^3)

**Rubi [A]** time = 0.0993907, antiderivative size = 144, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 30,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.1$ , Rules used = {2525, 12, 44}

$$-\frac{B \log\left(\frac{e(a+bx)}{c+dx}\right) + A}{2di^3(c+dx)^2} + \frac{b^2B \log(a+bx)}{2di^3(bc-ad)^2} - \frac{b^2B \log(c+dx)}{2di^3(bc-ad)^2} + \frac{bB}{2di^3(c+dx)(bc-ad)} + \frac{B}{4di^3(c+dx)^2}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])/(c\*i + d\*i\*x)^3,x]

[Out] B/(4\*d\*i^3\*(c + d\*x)^2) + (b\*B)/(2\*d\*(b\*c - a\*d)\*i^3\*(c + d\*x)) + (b^2\*B\*Log[a + b\*x])/(2\*d\*(b\*c - a\*d)^2\*i^3) - (A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])/(2\*d\*i^3\*(c + d\*x)^2) - (b^2\*B\*Log[c + d\*x])/(2\*d\*(b\*c - a\*d)^2\*i^3)

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_) /; FreeQ[b, x]]
```



Rule 44

```
Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\begin{aligned} \int \frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(50c + 50dx)^3} dx &= -\frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{250000d(c + dx)^2} + \frac{B \int \frac{bc-ad}{2500(a+bx)(c+dx)^3} dx}{100d} \\ &= -\frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{250000d(c + dx)^2} + \frac{(B(bc - ad)) \int \frac{1}{(a+bx)(c+dx)^3} dx}{250000d} \\ &= -\frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{250000d(c + dx)^2} + \frac{(B(bc - ad)) \int \left( \frac{b^3}{(bc-ad)^3(a+bx)} - \frac{d}{(bc-ad)(c+dx)^3} - \frac{bd}{(bc-ad)^2(c+dx)^2} - \frac{b^2c}{(bc-ad)^3} \right) dx}{250000d} \\ &= \frac{B}{500000d(c + dx)^2} + \frac{bB}{250000d(bc - ad)(c + dx)} + \frac{b^2B \log(a + bx)}{250000d(bc - ad)^2} - \frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{250000d(c + dx)^2} \end{aligned}$$

**Mathematica [A]** time = 0.11675, size = 111, normalized size = 0.77

$$\frac{\frac{B(2b^2(c+dx)^2 \log(a+bx) + (bc-ad)(-ad+3bc+2bdx) - 2b^2(c+dx)^2 \log(c+dx))}{(bc-ad)^2} - 2\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{4di^3(c + dx)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x]))/(c*i + d*i*x)^3,x]
```

```
[Out] (-2*(A + B*Log[(e*(a + b*x))/(c + d*x])) + (B*((b*c - a*d)*(3*b*c - a*d + 2
*b*d*x) + 2*b^2*(c + d*x)^2*Log[a + b*x] - 2*b^2*(c + d*x)^2*Log[c + d*x]))
/(b*c - a*d)^2)/(4*d*i^3*(c + d*x)^2)
```

**Maple [B]** time = 0.052, size = 746, normalized size = 5.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*(b\*x+a)/(d\*x+c)))/(d\*i\*x+c\*i)^3,x)

[Out]  $\frac{1}{2} \frac{1}{(a*d-b*c)^3} \frac{1}{i^3} B \ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)) * b^2 * a^{-1/2} / d / (a*d-b*c)^3 / i^3 * B \ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)) * b^3 * c^{-1/2} * d / (a*d-b*c)^3 / i^3 * B * b / (d*x+c) * a^2 + 1/2 / d / (a*d-b*c)^3 / i^3 * A / (d*x+c)^2 * b^3 * c^3 - 1/2 * d^2 / (a*d-b*c)^3 / i^3 * B \ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)) / (d*x+c)^2 * a^3 - 1/4 / d / (a*d-b*c)^3 / i^3 * B / (d*x+c)^2 * b^3 * c^3 - 1/2 / d / (a*d-b*c)^3 / i^3 * B * b^3 / (d*x+c) * c^2 - 3/2 / (a*d-b*c)^3 / i^3 * B \ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)) / (d*x+c)^2 * b^2 * c^2 * a + 3/2 * d / (a*d-b*c)^3 / i^3 * A * b^2 * a + 1 / (a*d-b*c)^3 / i^3 * B * b^2 / (d*x+c) * c * a - 3/2 / (a*d-b*c)^3 / i^3 * A / (d*x+c)^2 * a * b^2 * c^2 + 1/2 / d / (a*d-b*c)^3 / i^3 * B \ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)) / (d*x+c)^2 * b^3 * c^3 - 3/4 * d / (a*d-b*c)^3 / i^3 * B / (d*x+c)^2 * a^2 * b * c + 3/2 * d / (a*d-b*c)^3 / i^3 * A / (d*x+c)^2 * a^2 * b * c + 3/4 / (a*d-b*c)^3 / i^3 * B / (d*x+c)^2 * b^2 * c^2 * a - 1/2 / d / (a*d-b*c)^3 / i^3 * A * b^3 * c + 1/4 * d^2 / (a*d-b*c)^3 / i^3 * B / (d*x+c)^2 * a^3 - 1/2 * d^2 / (a*d-b*c)^3 / i^3 * A / (d*x+c)^2 * a^3 - 3/4 / (a*d-b*c)^3 / i^3 * B * b^2 * a + 3/4 / d / (a*d-b*c)^3 / i^3 * B * b^3 * c$

**Maxima [A]** time = 1.19764, size = 344, normalized size = 2.39

$$\frac{1}{4} B \left( \frac{2 b d x + 3 b c - a d}{(b c d^3 - a d^4) i^3 x^2 + 2 (b c^2 d^2 - a c d^3) i^3 x + (b c^3 d - a c^2 d^2) i^3} - \frac{2 \log\left(\frac{b e x}{d x + c} + \frac{a e}{d x + c}\right)}{d^3 i^3 x^2 + 2 c d^2 i^3 x + c^2 d i^3} + \frac{2 b^2 \log(b x + a)}{(b^2 c^2 d - 2 a b c d^2 + a^2 d^3) i^3} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(d\*i\*x+c\*i)^3,x, algorithm="maxima")

[Out]  $\frac{1}{4} B * ((2 * b * d * x + 3 * b * c - a * d) / ((b * c * d^3 - a * d^4) * i^3 * x^2 + 2 * (b * c^2 * d^2 - a * c * d^3) * i^3 * x + (b * c^3 * d - a * c^2 * d^2) * i^3) - 2 * \log(b * e * x / (d * x + c) + a * e / (d * x + c)) / (d^3 * i^3 * x^2 + 2 * c * d^2 * i^3 * x + c^2 * d * i^3) + 2 * b^2 * \log(b * x + a) / ((b^2 * c^2 * d - 2 * a * b * c * d^2 + a^2 * d^3) * i^3) - 2 * b^2 * \log(d * x + c) / ((b^2 * c^2 * d - 2 * a * b * c * d^2 + a^2 * d^3) * i^3)) - 1/2 * A / (d^3 * i^3 * x^2 + 2 * c * d^2 * i^3 * x + c^2 * d * i^3)$

**Fricas [A]** time = 0.486076, size = 455, normalized size = 3.16

$$\frac{(2 A - 3 B) b^2 c^2 - 4 (A - B) a b c d + (2 A - B) a^2 d^2 - 2 (B b^2 c d - B a b d^2) x - 2 (B b^2 d^2 x^2 + 2 B b^2 c d x + 2 B a b c d - B a^2 d^2) \log\left(\frac{b e x}{d x + c} + \frac{a e}{d x + c}\right)}{4 \left( (b^2 c^2 d^3 - 2 a b c d^4 + a^2 d^5) i^3 x^2 + 2 (b^2 c^3 d^2 - 2 a b c^2 d^3 + a^2 c d^4) i^3 x + (b^2 c^4 d - 2 a b c^3 d^2 + a^2 c^2 d^3) i^3 \right)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(d\*i\*x+c\*i)^3,x, algorithm="fricas")

[Out] 
$$-1/4*((2*A - 3*B)*b^2*c^2 - 4*(A - B)*a*b*c*d + (2*A - B)*a^2*d^2 - 2*(B*b^2*c*d - B*a*b*d^2)*x - 2*(B*b^2*d^2*x^2 + 2*B*b^2*c*d*x + 2*B*a*b*c*d - B*a^2*d^2)*\log((b*e*x + a*e)/(d*x + c)))/((b^2*c^2*d^3 - 2*a*b*c*d^4 + a^2*d^5)*i^3*x^2 + 2*(b^2*c^3*d^2 - 2*a*b*c^2*d^3 + a^2*c*d^4)*i^3*x + (b^2*c^4*d - 2*a*b*c^3*d^2 + a^2*c^2*d^3)*i^3)$$

**Sympy [B]** time = 2.99029, size = 422, normalized size = 2.93

$$\frac{Bb^2 \log\left(x + \frac{-\frac{Ba^3b^2d^3}{(ad-bc)^2} + \frac{3Ba^2b^3cd^2}{(ad-bc)^2} - \frac{3Bab^4c^2d}{(ad-bc)^2} + Bab^2d + \frac{Bb^5c^3}{(ad-bc)^2} + Bb^3c}{2Bb^3d}\right)}{2di^3(ad-bc)^2} + \frac{Bb^2 \log\left(x + \frac{\frac{Ba^3b^2d^3}{(ad-bc)^2} - \frac{3Ba^2b^3cd^2}{(ad-bc)^2} + \frac{3Bab^4c^2d}{(ad-bc)^2} + Bab^2d - \frac{Bb^5c^3}{(ad-bc)^2} + Bb^3c}{2Bb^3d}\right)}{2di^3(ad-bc)^2} - \frac{2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*(b\*x+a)/(d\*x+c)))/(d\*i\*x+c\*i)\*\*3,x)

[Out] 
$$-B*b**2*\log(x + (-B*a**3*b**2*d**3/(a*d - b*c)**2 + 3*B*a**2*b**3*c*d**2/(a*d - b*c)**2 - 3*B*a*b**4*c**2*d/(a*d - b*c)**2 + B*a*b**2*d + B*b**5*c**3/(a*d - b*c)**2 + B*b**3*c)/(2*B*b**3*d))/(2*d*i**3*(a*d - b*c)**2) + B*b**2*\log(x + (B*a**3*b**2*d**3/(a*d - b*c)**2 - 3*B*a**2*b**3*c*d**2/(a*d - b*c)**2 + 3*B*a*b**4*c**2*d/(a*d - b*c)**2 + B*a*b**2*d - B*b**5*c**3/(a*d - b*c)**2 + B*b**3*c)/(2*B*b**3*d))/(2*d*i**3*(a*d - b*c)**2) - B*\log(e*(a + b*x)/(c + d*x))/(2*c**2*d*i**3 + 4*c*d**2*i**3*x + 2*d**3*i**3*x**2) - (2*A*a*d - 2*A*b*c - B*a*d + 3*B*b*c + 2*B*b*d*x)/(4*a*c**2*d**2*i**3 - 4*b*c**3*d*i**3 + x**2*(4*a*d**4*i**3 - 4*b*c*d**3*i**3) + x*(8*a*c*d**3*i**3 - 8*b*c**2*d**2*i**3))$$

**Giac [A]** time = 1.31786, size = 282, normalized size = 1.96

$$-\frac{Bb^2 \log(bx + a)}{2(b^2c^2di - 2abcd^2i + a^2d^3i)} + \frac{Bb^2 \log(dx + c)}{2(b^2c^2di - 2abcd^2i + a^2d^3i)} - \frac{Bi \log\left(\frac{bx+a}{dx+c}\right)}{2(d^3x^2 + 2cd^2x + c^2d)} + \frac{2Bbdix - 2Abci + B}{4(bcd^3x^2 - ad^4x^2 + 2bc^2d^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(d*i*x+c*i)^3,x, algorithm="giac")
```

```
[Out] -1/2*B*b^2*log(b*x + a)/(b^2*c^2*d*i - 2*a*b*c*d^2*i + a^2*d^3*i) + 1/2*B*b^2*log(d*x + c)/(b^2*c^2*d*i - 2*a*b*c*d^2*i + a^2*d^3*i) - 1/2*B*i*log((b*x + a)/(d*x + c))/(d^3*x^2 + 2*c*d^2*x + c^2*d) + 1/4*(2*B*b*d*i*x - 2*A*b*c*i + B*b*c*i + 2*A*a*d*i + B*a*d*i)/(b*c*d^3*x^2 - a*d^4*x^2 + 2*b*c^2*d^2*x - 2*a*c*d^3*x + b*c^3*d - a*c^2*d^2)
```

$$3.51 \quad \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)(ci+dix)^3} dx$$

**Optimal.** Leaf size=243

$$\frac{b^2 \log\left(\frac{a+bx}{c+dx}\right) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{gi^3(bc-ad)^3} + \frac{d^2(a+bx)^2 \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{2gi^3(c+dx)^2(bc-ad)^3} - \frac{2bd(a+bx) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{gi^3(c+dx)(bc-ad)^3} - \frac{b^2 B \log^2\left(\frac{e(a+bx)}{c+dx}\right)}{2gi^3(bc-ad)^3}$$

[Out]  $-(B*(4*b - (d*(a + b*x))/(c + d*x))^2)/(4*(b*c - a*d)^3*g*i^3) - (b^2*B*Log[(a + b*x)/(c + d*x)]^2)/(2*(b*c - a*d)^3*g*i^3) + (d^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^3*g*i^3*(c + d*x)^2) - (2*b*d*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^3*g*i^3*(c + d*x)) + (b^2*Log[(a + b*x)/(c + d*x)]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^3*g*i^3)$

**Rubi [C]** time = 0.89849, antiderivative size = 535, normalized size of antiderivative = 2.2, number of steps used = 28, number of rules used = 11, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.275$ , Rules used = {2528, 2524, 12, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 44}

$$\frac{b^2 BPolyLog\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{gi^3(bc-ad)^3} + \frac{b^2 BPolyLog\left(2, \frac{b(c+dx)}{bc-ad}\right)}{gi^3(bc-ad)^3} + \frac{b^2 \log(a+bx) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{gi^3(bc-ad)^3} - \frac{b^2 \log(c+dx) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{gi^3(bc-ad)^3}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[(A + B*Log[(e*(a + b*x))/(c + d*x]])/((a*g + b*g*x)*(c*i + d*i*x)^3), x]$

[Out]  $-B/(4*(b*c - a*d)*g*i^3*(c + d*x)^2) - (3*b*B)/(2*(b*c - a*d)^2*g*i^3*(c + d*x)) - (3*b^2*B*Log[a + b*x])/(2*(b*c - a*d)^3*g*i^3) - (b^2*B*Log[a + b*x]^2)/(2*(b*c - a*d)^3*g*i^3) + (A + B*Log[(e*(a + b*x))/(c + d*x)])/(2*(b*c - a*d)*g*i^3*(c + d*x)^2) + (b*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^2*g*i^3*(c + d*x)) + (b^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^3*g*i^3) + (3*b^2*B*Log[c + d*x])/(2*(b*c - a*d)^3*g*i^3) + (b^2*B*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)^3*g*i^3) - (b^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/((b*c - a*d)^3*g*i^3) - (b^2*B*Log[c + d*x]^2)/(2*(b*c - a*d)^3*g*i^3) + (b^2*B*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g*i^3) + (b^2*B*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^3*g*i^3) + (b^2*B*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g*i^3)$

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_)^(m_.
)), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_)^(m_.))*((c_.) + (d_.)*(x_)^(n_.)), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(51c + 51dx)^3(ag + bgx)} dx &= \int \left( \frac{b^3 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{132651(bc - ad)^3 g(a + bx)} - \frac{d \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{132651(bc - ad)g(c + dx)^3} - \frac{bd \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{132651(bc - ad)^2 g(c + dx)} \right) dx \\
&= \frac{b^3 \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx} dx}{132651(bc - ad)^3 g} - \frac{(b^2 d) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx} dx}{132651(bc - ad)^3 g} - \frac{(bd) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(c+dx)^2} dx}{132651(bc - ad)^2 g} - \frac{d \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx} dx}{132651(bc - ad)g} \\
&= \frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{265302(bc - ad)g(c + dx)^2} + \frac{b \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{132651(bc - ad)^2 g(c + dx)} + \frac{b^2 \log(a + bx) \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{132651(bc - ad)^3 g} \\
&= \frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{265302(bc - ad)g(c + dx)^2} + \frac{b \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{132651(bc - ad)^2 g(c + dx)} + \frac{b^2 \log(a + bx) \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{132651(bc - ad)^3 g} \\
&= \frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{265302(bc - ad)g(c + dx)^2} + \frac{b \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{132651(bc - ad)^2 g(c + dx)} + \frac{b^2 \log(a + bx) \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{132651(bc - ad)^3 g} \\
&= -\frac{B}{530604(bc - ad)g(c + dx)^2} - \frac{bB}{88434(bc - ad)^2 g(c + dx)} - \frac{b^2 B \log(a + bx)}{88434(bc - ad)^3 g} + \frac{A}{265302} \\
&= -\frac{B}{530604(bc - ad)g(c + dx)^2} - \frac{bB}{88434(bc - ad)^2 g(c + dx)} - \frac{b^2 B \log(a + bx)}{88434(bc - ad)^3 g} + \frac{A}{265302} \\
&= -\frac{B}{530604(bc - ad)g(c + dx)^2} - \frac{bB}{88434(bc - ad)^2 g(c + dx)} - \frac{b^2 B \log(a + bx)}{88434(bc - ad)^3 g} - \frac{b^2 B \log(a + bx)}{265302} \\
&= -\frac{B}{530604(bc - ad)g(c + dx)^2} - \frac{bB}{88434(bc - ad)^2 g(c + dx)} - \frac{b^2 B \log(a + bx)}{88434(bc - ad)^3 g} - \frac{b^2 B \log(a + bx)}{265302}
\end{aligned}$$

**Mathematica [C]** time = 0.46679, size = 418, normalized size = 1.72

$$-2b^2B(c + dx)^2 \left( \log(a + bx) \left( \log(a + bx) - 2 \log\left(\frac{b(c+dx)}{bc-ad}\right) \right) - 2 \text{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) \right) + 2b^2B(c + dx)^2 \left( 2 \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right) \right)$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))/((a\*g + b\*g\*x)\*(c+i + d\*i\*x)^3), x]



```
[Out] (2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 4*b*(b*c - a*d)*(c
+ d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 4*b^2*(c + d*x)^2*Log[a + b*x
]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 4*b^2*(c + d*x)^2*(A + B*Log[(e*(a
+ b*x))/(c + d*x)])*Log[c + d*x] - 4*b*B*(c + d*x)*(b*c - a*d + b*(c + d*x
))*Log[a + b*x] - b*(c + d*x)*Log[c + d*x]) - B*((b*c - a*d)^2 + 2*b*(b*c -
a*d)*(c + d*x) + 2*b^2*(c + d*x)^2*Log[a + b*x] - 2*b^2*(c + d*x)^2*Log[c +
d*x]) - 2*b^2*B*(c + d*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*
x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-b*c + a*d)]) + 2*b^2*B*(
c + d*x)^2*((2*Log[(d*(a + b*x))/(-b*c + a*d)] - Log[c + d*x])*Log[c + d*
x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(4*(b*c - a*d)^3*g*i^3*(c +
d*x)^2)
```

---

**Maple [B]** time = 0.054, size = 1287, normalized size = 5.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i)^3,x)
```

```
[Out] -3/2/i^3/(a*d-b*c)^4/g*A*b^3*c-3/2*d^2/i^3/(a*d-b*c)^4/g*B*b/(d*x+c)*a^2+3/
2*d/i^3/(a*d-b*c)^4/g*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*a-1/2*d/i^3/(a*
d-b*c)^4/g*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+1/2/i^3/(a*d-b*c)^4/g*
B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*b^3*c^3-1/2*d^3/i^3/(a*d-b*c)^4
/g*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^3-d/i^3/(a*d-b*c)^4/g*A*b^
2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-7/4*d/i^3/(a*d-b*c)^4/g*B*b^2*a+7/4/i^3
/(a*d-b*c)^4/g*B*b^3*c-3/2*d/i^3/(a*d-b*c)^4/g*A/(d*x+c)^2*a*b^2*c^2+3/2*d/
i^3/(a*d-b*c)^4/g*A*b^2*a+1/i^3/(a*d-b*c)^4/g*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x
+c))*b^3/(d*x+c)*c^2+d^2/i^3/(a*d-b*c)^4/g*A*b/(d*x+c)*a^2-3/2/i^3/(a*d-b*c
)^4/g*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3*c+1/2/i^3/(a*d-b*c)^4/g*B*b^3*ln
(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-1/2*d^3/i^3/(a*d-b*c)^4/g*A/(d*x+c)^2*a^
3+1/i^3/(a*d-b*c)^4/g*A*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+1/2/i^3/(a*d-
b*c)^4/g*A/(d*x+c)^2*b^3*c^3+1/i^3/(a*d-b*c)^4/g*A*b^3/(d*x+c)*c^2+1/4*d^3/
i^3/(a*d-b*c)^4/g*B/(d*x+c)^2*a^3-1/4/i^3/(a*d-b*c)^4/g*B/(d*x+c)^2*b^3*c^3
-3/2/i^3/(a*d-b*c)^4/g*B*b^3/(d*x+c)*c^2+3/2*d^2/i^3/(a*d-b*c)^4/g*B*ln(b*e
/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^2*b*c-3/2*d/i^3/(a*d-b*c)^4/g*B*ln(b*
e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a*b^2*c^2-2*d/i^3/(a*d-b*c)^4/g*B*ln(b
*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2/(d*x+c)*a*c+d^2/i^3/(a*d-b*c)^4/g*B*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))*b/(d*x+c)*a^2-2*d/i^3/(a*d-b*c)^4/g*A*b^2/(d*x+c)*
a*c+3/4*d/i^3/(a*d-b*c)^4/g*B/(d*x+c)^2*a*b^2*c^2-3/4*d^2/i^3/(a*d-b*c)^4/g
*B/(d*x+c)^2*a^2*b*c+3/2*d^2/i^3/(a*d-b*c)^4/g*A/(d*x+c)^2*a^2*b*c+3*d/i^3/
(a*d-b*c)^4/g*B*b^2/(d*x+c)*a*c
```

**Maxima [B]** time = 1.42318, size = 1195, normalized size = 4.92

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)/(d\*i\*x+c\*i)^3,x, algorithm="maxima")

[Out]  $\frac{1}{2}B \left( \frac{(2bdx + 3bc - ad)}{(b^2c^2d^2 - 2abc^2d^3 + a^2d^4)} g^i^3 x^2 + 2(b^2c^3d - 2abc^2d^2 + a^2c^2d^3) g^i^3 x + (b^2c^4 - 2abc^3d + a^2c^2d^2) g^i^3 \right) + 2b^2 \log(bx + a) / \left( (b^3c^3 - 3a^2b^2c^2d + 3a^2b^2c^2d - a^3d^3) g^i^3 \right) - 2b^2 \log(dx + c) / \left( (b^3c^3 - 3a^2b^2c^2d + 3a^2b^2c^2d - a^3d^3) g^i^3 \right) * \log\left(\frac{bex}{dx+c} + \frac{ae}{dx+c}\right) + \frac{1}{2}A \left( \frac{(2bdx + 3bc - ad)}{(b^2c^2d^2 - 2abc^2d^3 + a^2d^4)} g^i^3 x^2 + 2(b^2c^3d - 2abc^2d^2 + a^2c^2d^3) g^i^3 x + (b^2c^4 - 2abc^3d + a^2c^2d^2) g^i^3 \right) + 2b^2 \log(bx + a) / \left( (b^3c^3 - 3a^2b^2c^2d + 3a^2b^2c^2d - a^3d^3) g^i^3 \right) - 2b^2 \log(dx + c) / \left( (b^3c^3 - 3a^2b^2c^2d + 3a^2b^2c^2d - a^3d^3) g^i^3 \right) - \frac{1}{4} (7b^2c^2 - 8abcd + a^2d^2 + 2(b^2d^2x^2 + 2b^2c^2dx + b^2c^2) \log(bx + a)^2 + 2(b^2d^2x^2 + 2b^2c^2dx + b^2c^2) \log(dx + c)^2 + 6(b^2cd - ab^2d^2) x + 6(b^2d^2x^2 + 2b^2c^2dx + b^2c^2) \log(bx + a) - 2(3b^2d^2x^2 + 6b^2c^2dx + 3b^2c^2 + 2(b^2d^2x^2 + 2b^2c^2dx + b^2c^2) \log(bx + a)) \log(dx + c)) B / (b^3c^5g^i^3 - 3a^2b^2c^4d^2g^i^3 + 3a^2b^2c^3d^2g^i^3 - a^3c^2d^3g^i^3 + (b^3c^3d^2g^i^3 - 3a^2b^2c^2d^3g^i^3 + 3a^2b^2c^2d^4g^i^3 - a^3d^5g^i^3) x^2 + 2(b^3c^4d^2g^i^3 - 3a^2b^2c^3d^2g^i^3 + 3a^2b^2c^2d^3g^i^3 - a^3cd^4g^i^3) x)$

**Fricas [A]** time = 0.534056, size = 730, normalized size = 3.

$$\frac{(6A - 7B)b^2c^2 - 8(A - B)abcd + (2A - B)a^2d^2 + 2(Bb^2d^2x^2 + 2Bb^2cdx + Bb^2c^2) \log\left(\frac{bex+ae}{dx+c}\right)^2 + 2((2A - 3B)b^2cd - (4((b^3c^3d^2 - 3ab^2c^2d^3 + 3a^2bcd^4 - a^3d^5)gi^3x^2 + 2(b^3c^4d - 3ab^2c^3d^2 + 3$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)/(d\*i\*x+c\*i)^3,x, algorithm="fricas")

[Out]  $\frac{1}{4}((6A - 7B)b^2c^2 - 8(A - B)abcd + (2A - B)a^2d^2 + 2(Bb^2d^2x^2 + 2Bb^2cdx + Bb^2c^2) \log\left(\frac{bex+ae}{dx+c}\right)^2 + 2(($

```
2*A - 3*B)*b^2*c*d - (2*A - 3*B)*a*b*d^2)*x + 2*((2*A - 3*B)*b^2*d^2*x^2 +
2*A*b^2*c^2 - 4*B*a*b*c*d + B*a^2*d^2 + 2*(2*(A - B)*b^2*c*d - B*a*b*d^2)*x
)*log((b*e*x + a*e)/(d*x + c)))/((b^3*c^3*d^2 - 3*a*b^2*c^2*d^3 + 3*a^2*b*c
*d^4 - a^3*d^5)*g*i^3*x^2 + 2*(b^3*c^4*d - 3*a*b^2*c^3*d^2 + 3*a^2*b*c^2*d^
3 - a^3*c*d^4)*g*i^3*x + (b^3*c^5 - 3*a*b^2*c^4*d + 3*a^2*b*c^3*d^2 - a^3*c
^2*d^3)*g*i^3)
```

**Sympy [B]** time = 8.0485, size = 889, normalized size = 3.66

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i)**3,x)
```

```
[Out] -B*b**2*log(e*(a + b*x)/(c + d*x))**2/(2*a**3*d**3*g*i**3 - 6*a**2*b*c*d**2
*g*i**3 + 6*a*b**2*c**2*d*g*i**3 - 2*b**3*c**3*g*i**3) + b**2*(2*A - 3*B)*l
og(x + (2*A*a*b**2*d + 2*A*b**3*c - 3*B*a*b**2*d - 3*B*b**3*c - a**4*b**2*d
**4*(2*A - 3*B)/(a*d - b*c)**3 + 4*a**3*b**3*c*d**3*(2*A - 3*B)/(a*d - b*c)
**3 - 6*a**2*b**4*c**2*d**2*(2*A - 3*B)/(a*d - b*c)**3 + 4*a*b**5*c**3*d*(2
*A - 3*B)/(a*d - b*c)**3 - b**6*c**4*(2*A - 3*B)/(a*d - b*c)**3)/(4*A*b**3*
d - 6*B*b**3*d))/(2*g*i**3*(a*d - b*c)**3) - b**2*(2*A - 3*B)*log(x + (2*A*
a*b**2*d + 2*A*b**3*c - 3*B*a*b**2*d - 3*B*b**3*c + a**4*b**2*d**4*(2*A - 3
*B)/(a*d - b*c)**3 - 4*a**3*b**3*c*d**3*(2*A - 3*B)/(a*d - b*c)**3 + 6*a**2
*b**4*c**2*d**2*(2*A - 3*B)/(a*d - b*c)**3 - 4*a*b**5*c**3*d*(2*A - 3*B)/(a
*d - b*c)**3 + b**6*c**4*(2*A - 3*B)/(a*d - b*c)**3)/(4*A*b**3*d - 6*B*b**3
*d))/(2*g*i**3*(a*d - b*c)**3) + (-B*a*d + 3*B*b*c + 2*B*b*d*x)*log(e*(a +
b*x)/(c + d*x))/(2*a**2*c**2*d**2*g*i**3 + 4*a**2*c*d**3*g*i**3*x + 2*a**2*
d**4*g*i**3*x**2 - 4*a*b*c**3*d*g*i**3 - 8*a*b*c**2*d**2*g*i**3*x - 4*a*b*c
*d**3*g*i**3*x**2 + 2*b**2*c**4*g*i**3 + 4*b**2*c**3*d*g*i**3*x + 2*b**2*c
**2*d**2*g*i**3*x**2) + (-2*A*a*d + 6*A*b*c + B*a*d - 7*B*b*c + x*(4*A*b*d -
6*B*b*d))/(4*a**2*c**2*d**2*g*i**3 - 8*a*b*c**3*d*g*i**3 + 4*b**2*c**4*g*i
**3 + x**2*(4*a**2*d**4*g*i**3 - 8*a*b*c*d**3*g*i**3 + 4*b**2*c**2*d**2*g*i
**3) + x*(8*a**2*c*d**3*g*i**3 - 16*a*b*c**2*d**2*g*i**3 + 8*b**2*c**3*d*g*
i**3))
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{B \log\left(\frac{(bx+a)e}{dx+c}\right) + A}{(bgx + ag)(dix + ci)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)/(d*i*x+c*i)^3,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)/((b*g*x + a*g)*(d*i*x + c*i)^3), x)
```

$$3.52 \quad \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^2(ci+dix)^3} dx$$

**Optimal.** Leaf size=365

$$\frac{b^3(c+dx)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^2i^3(a+bx)(bc-ad)^4} - \frac{3b^2d \log\left(\frac{a+bx}{c+dx}\right)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^2i^3(bc-ad)^4} + \frac{3bd^2(a+bx)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^2i^3(c+dx)(bc-ad)^4} - \frac{d^3(a+bx)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^2i^3(a+bx)(bc-ad)^4}$$

[Out]  $(B*d^3*(a + b*x)^2)/(4*(b*c - a*d)^4*g^2*i^3*(c + d*x)^2) - (3*b*B*d^2*(a + b*x))/((b*c - a*d)^4*g^2*i^3*(c + d*x)) - (b^3*B*(c + d*x))/((b*c - a*d)^4*g^2*i^3*(a + b*x)) + (3*b^2*B*d*Log[(a + b*x)/(c + d*x)]^2)/(2*(b*c - a*d)^4*g^2*i^3) - (d^3*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^4*g^2*i^3*(c + d*x)^2) + (3*b*d^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^4*g^2*i^3*(c + d*x)) - (b^3*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^4*g^2*i^3*(a + b*x)) - (3*b^2*d*Log[(a + b*x)/(c + d*x)]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^4*g^2*i^3)$

**Rubi [C]** time = 1.11099, antiderivative size = 631, normalized size of antiderivative = 1.73, number of steps used = 32, number of rules used = 11, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.275$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{3b^2Bd \text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{g^2i^3(bc-ad)^4} - \frac{3b^2Bd \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{g^2i^3(bc-ad)^4} - \frac{3b^2d \log(a+bx)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^2i^3(bc-ad)^4} - \frac{b^2\left(B \log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^2i^3(a+bx)(bc-ad)^4}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])/((a\*g + b\*g\*x)^2\*(c\*i + d\*i\*x)^3), x]

[Out]  $-((b^2*B)/((b*c - a*d)^3*g^2*i^3*(a + b*x))) + (B*d)/(4*(b*c - a*d)^2*g^2*i^3*(c + d*x)^2) + (5*b*B*d)/(2*(b*c - a*d)^3*g^2*i^3*(c + d*x)) + (3*b^2*B*d*Log[a + b*x])/(2*(b*c - a*d)^4*g^2*i^3) + (3*b^2*B*d*Log[a + b*x]^2)/(2*(b*c - a*d)^4*g^2*i^3) - (b^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^3*g^2*i^3*(a + b*x)) - (d*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^2*g^2*i^3*(c + d*x)^2) - (2*b*d*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^3*g^2*i^3*(c + d*x)) - (3*b^2*d*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^4*g^2*i^3) - (3*b^2*B*d*Log[c + d*x])/(2*(b*c - a*d)^4*g^2*i^3) - (3*b^2*B*d*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)^4*g^2*i^3) + (3*b^2*d*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^3*g^2*i^3*(a + b*x))$

$$\begin{aligned} &+ d*x)) * \text{Log}[c + d*x] / ((b*c - a*d)^4 * g^{2*i^3}) + (3*b^2 * B*d * \text{Log}[c + d*x]^2) / (2*(b*c - a*d)^4 * g^{2*i^3}) - (3*b^2 * B*d * \text{Log}[a + b*x] * \text{Log}[(b*(c + d*x)) / (b*c - a*d)]) / ((b*c - a*d)^4 * g^{2*i^3}) - (3*b^2 * B*d * \text{PolyLog}[2, -((d*(a + b*x)) / (b*c - a*d))]) / ((b*c - a*d)^4 * g^{2*i^3}) - (3*b^2 * B*d * \text{PolyLog}[2, (b*(c + d*x)) / (b*c - a*d)]) / ((b*c - a*d)^4 * g^{2*i^3}) \end{aligned}$$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(Rfx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, Rfx, x]},
```

Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[  
RFx, x] && IntegerQ[p]

### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.  
)\*(x\_))^(q\_.), x\_Symbol] :> Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^  
n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E  
qQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] :> Simp[(a + b\*Lo  
g[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_  
)), x\_Symbol] :> Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x  
)^n]))/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x  
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_  
Symbol] :> Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x  
, x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*  
(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] :> -Simp[PolyLog[2  
, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rubi steps

$$\begin{aligned}
\int \frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(52c + 52dx)^3(ag + bgx)^2} dx &= \int \left( \frac{b^3 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{140608(bc - ad)^3 g^2 (a + bx)^2} - \frac{3b^3 d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{140608(bc - ad)^4 g^2 (a + bx)} + \frac{d^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{140608(bc - ad)^2 g^2 (c + dx)^2} \right) dx \\
&= -\frac{(3b^3 d) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx} dx}{140608(bc - ad)^4 g^2} + \frac{(3b^2 d^2) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx} dx}{140608(bc - ad)^4 g^2} + \frac{b^3 \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2} dx}{140608(bc - ad)^3 g^2} + \\
&= -\frac{b^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{140608(bc - ad)^3 g^2 (a + bx)} - \frac{d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{281216(bc - ad)^2 g^2 (c + dx)^2} - \frac{bd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{70304(bc - ad)^3 g^2 (c + dx)} \\
&= -\frac{b^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{140608(bc - ad)^3 g^2 (a + bx)} - \frac{d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{281216(bc - ad)^2 g^2 (c + dx)^2} - \frac{bd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{70304(bc - ad)^3 g^2 (c + dx)} \\
&= -\frac{b^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{140608(bc - ad)^3 g^2 (a + bx)} - \frac{d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{281216(bc - ad)^2 g^2 (c + dx)^2} - \frac{bd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{70304(bc - ad)^3 g^2 (c + dx)} \\
&= -\frac{b^2 B}{140608(bc - ad)^3 g^2 (a + bx)} + \frac{Bd}{562432(bc - ad)^2 g^2 (c + dx)^2} + \frac{5bBd}{281216(bc - ad)^3 g^2 (c + dx)} \\
&= -\frac{b^2 B}{140608(bc - ad)^3 g^2 (a + bx)} + \frac{Bd}{562432(bc - ad)^2 g^2 (c + dx)^2} + \frac{5bBd}{281216(bc - ad)^3 g^2 (c + dx)} \\
&= -\frac{b^2 B}{140608(bc - ad)^3 g^2 (a + bx)} + \frac{Bd}{562432(bc - ad)^2 g^2 (c + dx)^2} + \frac{5bBd}{281216(bc - ad)^3 g^2 (c + dx)} \\
&= -\frac{b^2 B}{140608(bc - ad)^3 g^2 (a + bx)} + \frac{Bd}{562432(bc - ad)^2 g^2 (c + dx)^2} + \frac{5bBd}{281216(bc - ad)^3 g^2 (c + dx)}
\end{aligned}$$

**Mathematica [C]** time = 0.787865, size = 452, normalized size = 1.24

$$6b^2 B d \left( \log(a + bx) \left( \log(a + bx) - 2 \log\left(\frac{b(c+dx)}{bc-ad}\right) \right) - 2 \text{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) \right) - 6b^2 B d \left( 2 \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right) + \log(c + dx) \right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x]))/((a*g + b*g*x)^2*(c*i + d*i*x)^3), x]
```



```
[Out] ((-4*b^3*B*c)/(a + b*x) + (4*a*b^2*B*d)/(a + b*x) + (B*d*(b*c - a*d)^2)/(c + d*x)^2 + (8*b^2*B*c*d)/(c + d*x) - (8*a*b*B*d^2)/(c + d*x) + (2*b*B*d*(b*c - a*d))/(c + d*x) + 6*b^2*B*d*Log[a + b*x] - (4*b^2*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x]]))/(a + b*x) - (2*d*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x]]))/(c + d*x)^2 - (8*b*d*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x]]))/(c + d*x) - 12*b^2*d*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x]]) - 6*b^2*B*d*Log[c + d*x] + 12*b^2*d*(A + B*Log[(e*(a + b*x))/(c + d*x]])*Log[c + d*x] + 6*b^2*B*d*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)])) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)] - 6*b^2*B*d*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(4*(b*c - a*d)^4*g^2*i^3)
```

**Maple [B]** time = 0.053, size = 1729, normalized size = 4.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x)
```

```
[Out] -5/2*d/i^3/(a*d-b*c)^5/g^2*A*b^3*c+11/4*d/i^3/(a*d-b*c)^5/g^2*B*b^3*c+5/2*d^2/i^3/(a*d-b*c)^5/g^2*A*b^2*a-11/4*d^2/i^3/(a*d-b*c)^5/g^2*B*b^2*a-4*d^2/i^3/(a*d-b*c)^5/g^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2/(d*x+c)*a*c-e*d/i^3/(a*d-b*c)^5/g^2*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+3/2*d^3/i^3/(a*d-b*c)^5/g^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^2*b*c-3/2*d^2/i^3/(a*d-b*c)^5/g^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a*b^2*c^2-3/2*d^2/i^3/(a*d-b*c)^5/g^2*A/(d*x+c)^2*b^2*c^2*a-3/4*d^3/i^3/(a*d-b*c)^5/g^2*B/(d*x+c)^2*a^2*b*c+3/2*d^3/i^3/(a*d-b*c)^5/g^2*A/(d*x+c)^2*a^2*b*c+3/4*d^2/i^3/(a*d-b*c)^5/g^2*B/(d*x+c)^2*a*b^2*c^2+5*d^2/i^3/(a*d-b*c)^5/g^2*B*b^2/(d*x+c)*a*c+e/i^3/(a*d-b*c)^5/g^2*B*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-e*d/i^3/(a*d-b*c)^5/g^2*A*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-e*d/i^3/(a*d-b*c)^5/g^2*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+2*d^3/i^3/(a*d-b*c)^5/g^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b/(d*x+c)*a^2+2*d/i^3/(a*d-b*c)^5/g^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3/(d*x+c)*c^2+1/2*d/i^3/(a*d-b*c)^5/g^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*b^3*c^3+2*d^3/i^3/(a*d-b*c)^5/g^2*A*b/(d*x+c)*a^2-1/4*d/i^3/(a*d-b*c)^5/g^2*B/(d*x+c)^2*b^3*c^3+e/i^3/(a*d-b*c)^5/g^2*A*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c+e/i^3/(a*d-b*c)^5/g^2*B*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c+2*d/i^3/(a*d-b*c)^5/g^2*A*b^3/(d*x+c)*c^2+1/2*d/i^3/(a*d-b*c)^5/g^2*A/(d*x+c)^2*b^3*c^3-5/2*d^3/i^3/(a*d-b*c)^5/g^2*B*b/(d*x+c)*a^2-5/2*d/i^3/(a*d-b*c)^5/g^2*B*b^3/(d*x+c)*c^2+3/2*d/i^3/(a*d-b*c)^5/g^2*B*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c+1/4*d
```

$$\begin{aligned} &^4/i^3/(a*d-b*c)^5/g^2*B/(d*x+c)^2*a^3-1/2*d^4/i^3/(a*d-b*c)^5/g^2*A/(d*x+c) \\ &)^2*a^3-4*d^2/i^3/(a*d-b*c)^5/g^2*A*b^2/(d*x+c)*a*c-3/2*d^2/i^3/(a*d-b*c)^5 \\ &/g^2*B*b^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a-3*d^2/i^3/(a*d-b*c)^5/g^2*A* \\ &b^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-1/2*d^4/i^3/(a*d-b*c)^5/g^2*B*\ln(b*e/ \\ &d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^3+5/2*d^2/i^3/(a*d-b*c)^5/g^2*B*\ln(b*e \\ &/d+(a*d-b*c)*e/d/(d*x+c))*b^2*a-5/2*d/i^3/(a*d-b*c)^5/g^2*B*\ln(b*e/d+(a*d-b \\ &*)*e/d/(d*x+c))*b^3*c+3*d/i^3/(a*d-b*c)^5/g^2*A*b^3*\ln(b*e/d+(a*d-b*c)*e/d \\ &/d*x+c))*c \end{aligned}$$

**Maxima [B]** time = 1.90353, size = 2323, normalized size = 6.36

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)^2/(d\*i\*x+c\*i)^3,x, algorithm="maxima")

[Out] 
$$\begin{aligned} &-1/2*B*((6*b^2*d^2*x^2 + 2*b^2*c^2 + 5*a*b*c*d - a^2*d^2 + 3*(3*b^2*c*d + a \\ &*b*d^2)*x)/((b^4*c^3*d^2 - 3*a*b^3*c^2*d^3 + 3*a^2*b^2*c*d^4 - a^3*b*d^5)*g \\ &^2*i^3*x^3 + (2*b^4*c^4*d - 5*a*b^3*c^3*d^2 + 3*a^2*b^2*c^2*d^3 + a^3*b*c*d^4 - a^4*d^5)*g \\ &^2*i^3*x^2 + (b^4*c^5 - a*b^3*c^4*d - 3*a^2*b^2*c^3*d^2 + 5*a^3*b*c^2*d^3 - 2*a^4*c*d^4)*g \\ &^2*i^3*x + (a*b^3*c^5 - 3*a^2*b^2*c^4*d + 3*a^3*b*c^3*d^2 - a^4*c^2*d^3)*g^2*i^3) + 6*b^2*d*log(b*x + a) \\ &/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^2*i^3) - 6*b^2*d*log(d*x + c) \\ &/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^2*i^3))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 1/2*A*((6*b^2 \\ &*d^2*x^2 + 2*b^2*c^2 + 5*a*b*c*d - a^2*d^2 + 3*(3*b^2*c*d + a*b*d^2)*x)/((b^4*c^3*d^2 - 3*a*b^3*c^2*d^3 + 3*a^2*b^2*c*d^4 - a^3*b*d^5)*g \\ &^2*i^3*x^3 + (2*b^4*c^4*d - 5*a*b^3*c^3*d^2 + 3*a^2*b^2*c^2*d^3 + a^3*b*c*d^4 - a^4*d^5)*g \\ &^2*i^3*x^2 + (b^4*c^5 - a*b^3*c^4*d - 3*a^2*b^2*c^3*d^2 + 5*a^3*b*c^2*d^3 - 2*a^4*c*d^4)*g \\ &^2*i^3*x + (a*b^3*c^5 - 3*a^2*b^2*c^4*d + 3*a^3*b*c^3*d^2 - a^4*c^2*d^3)*g^2*i^3) + 6*b^2*d*log(b*x + a) \\ &/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^2*i^3) - 6*b^2*d*log(d*x + c) \\ &/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^2*i^3)) - 1/4*(4*b^3*c^3 - 15*a*b^2*c^2*d + 12*a^2*b*c*d^2 - a^3*d^3 - 6*( \\ &b^3*c*d^2 - a*b^2*d^3)*x^2 - 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c \\ &*d^2)*x)*log(d*x + c)^2 - 3*(b^3*c^2*d + 2*a*b^2*c*d^2 - 3*a^2*b*d^3)*x - 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + \\ &2*a*b^2*c*d^2)*x)*log(b*x + a) + 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*log(b*x + a) \end{aligned}$$

$$2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x + 2*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*\log(b*x + a)*\log(d*x + c))*B/(a*b^4*c^6*g^2*i^3 - 4*a^2*b^3*c^5*d*g^2*i^3 + 6*a^3*b^2*c^4*d^2*g^2*i^3 - 4*a^4*b*c^3*d^3*g^2*i^3 + a^5*c^2*d^4*g^2*i^3 + (b^5*c^4*d^2*g^2*i^3 - 4*a*b^4*c^3*d^3*g^2*i^3 + 6*a^2*b^3*c^2*d^4*g^2*i^3 - 4*a^3*b^2*c*d^5*g^2*i^3 + a^4*b*d^6*g^2*i^3)*x^3 + (2*b^5*c^5*d*g^2*i^3 - 7*a*b^4*c^4*d^2*g^2*i^3 + 8*a^2*b^3*c^3*d^3*g^2*i^3 - 2*a^3*b^2*c^2*d^4*g^2*i^3 - 2*a^4*b*c*d^5*g^2*i^3 + a^5*d^6*g^2*i^3)*x^2 + (b^5*c^6*g^2*i^3 - 2*a*b^4*c^5*d*g^2*i^3 - 2*a^2*b^3*c^4*d^2*g^2*i^3 + 8*a^3*b^2*c^3*d^3*g^2*i^3 - 7*a^4*b*c^2*d^4*g^2*i^3 + 2*a^5*c*d^5*g^2*i^3)*x)$$

**Fricas [A]** time = 0.567175, size = 1368, normalized size = 3.75

$$\frac{4(A+B)b^3c^3 + 3(2A-5B)ab^2c^2d - 12(A-B)a^2bcd^2 + (2A-B)a^3d^3 + 6((2A-B)b^3cd^2 - (2A-B)ab^2d^3)x^2 + 6((b^5c^4d^2 - 4ab^4c^3d^3 + 6a^2b^3c^2d^4 -$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)^2/(d\*i\*x+c\*i)^3,x, algorithm="fricas")

[Out]  $-1/4*(4*(A+B)*b^3*c^3 + 3*(2*A-5*B)*a*b^2*c^2*d - 12*(A-B)*a^2*b*c*d^2 + (2*A-B)*a^3*d^3 + 6*((2*A-B)*b^3*c*d^2 - (2*A-B)*a*b^2*d^3)*x^2 + 6*(B*b^3*d^3*x^3 + B*a*b^2*c^2*d + (2*B*b^3*c*d^2 + B*a*b^2*d^3)*x^2 + (B*b^3*c^2*d + 2*B*a*b^2*c*d^2)*x)*\log((b*e*x + a*e)/(d*x + c))^2 + 3*((6*A-B)*b^3*c^2*d - 2*(2*A+B)*a*b^2*c*d^2 - (2*A-3*B)*a^2*b*d^3)*x + 2*(3*(2*A-B)*b^3*d^3*x^3 + 2*B*b^3*c^3 + 6*A*a*b^2*c^2*d - 6*B*a^2*b*c*d^2 + B*a^3*d^3 + 3*(4*A*b^3*c*d^2 + (2*A-3*B)*a*b^2*d^3)*x^2 + 3*(2*(A+B)*b^3*c^2*d + 4*(A-B)*a*b^2*c*d^2 - B*a^2*b*d^3)*x)*\log((b*e*x + a*e)/(d*x + c)))/((b^5*c^4*d^2 - 4*a*b^4*c^3*d^3 + 6*a^2*b^3*c^2*d^4 - 4*a^3*b^2*c*d^5 + a^4*b*d^6)*g^2*i^3*x^3 + (2*b^5*c^5*d - 7*a*b^4*c^4*d^2 + 8*a^2*b^3*c^3*d^3 - 2*a^3*b^2*c^2*d^4 - 2*a^4*b*c*d^5 + a^5*d^6)*g^2*i^3*x^2 + (b^5*c^6 - 2*a*b^4*c^5*d - 2*a^2*b^3*c^4*d^2 + 8*a^3*b^2*c^3*d^3 - 7*a^4*b*c^2*d^4 + 2*a^5*c*d^5)*g^2*i^3*x + (a*b^4*c^6 - 4*a^2*b^3*c^5*d + 6*a^3*b^2*c^4*d^2 - 4*a^4*b*c^3*d^3 + a^5*c^2*d^4)*g^2*i^3)$

**Sympy [B]** time = 33.0362, size = 1562, normalized size = 4.28

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)\*\*2/(d\*i\*x+c\*i)\*\*3,x)

[Out] 
$$\begin{aligned} & -3*B*b**2*d*\log(e*(a + b*x)/(c + d*x))**2/(2*a**4*d**4*g**2*i**3 - 8*a**3*b \\ & *c*d**3*g**2*i**3 + 12*a**2*b**2*c**2*d**2*g**2*i**3 - 8*a*b**3*c**3*d*g**2 \\ & *i**3 + 2*b**4*c**4*g**2*i**3) + 3*b**2*d*(2*A - B)*\log(x + (6*A*a*b**2*d** \\ & 2 + 6*A*b**3*c*d - 3*B*a*b**2*d**2 - 3*B*b**3*c*d - 3*a**5*b**2*d**6*(2*A - \\ & B)/(a*d - b*c))**4 + 15*a**4*b**3*c*d**5*(2*A - B)/(a*d - b*c)**4 - 30*a**3 \\ & *b**4*c**2*d**4*(2*A - B)/(a*d - b*c)**4 + 30*a**2*b**5*c**3*d**3*(2*A - B) \\ & / (a*d - b*c)**4 - 15*a*b**6*c**4*d**2*(2*A - B)/(a*d - b*c)**4 + 3*b**7*c** \\ & 5*d*(2*A - B)/(a*d - b*c)**4)/(12*A*b**3*d**2 - 6*B*b**3*d**2))/(2*g**2*i** \\ & 3*(a*d - b*c)**4) - 3*b**2*d*(2*A - B)*\log(x + (6*A*a*b**2*d**2 + 6*A*b**3* \\ & c*d - 3*B*a*b**2*d**2 - 3*B*b**3*c*d + 3*a**5*b**2*d**6*(2*A - B)/(a*d - b* \\ & c))**4 - 15*a**4*b**3*c*d**5*(2*A - B)/(a*d - b*c)**4 + 30*a**3*b**4*c**2*d \\ & **4*(2*A - B)/(a*d - b*c)**4 - 30*a**2*b**5*c**3*d**3*(2*A - B)/(a*d - b*c)* \\ & **4 + 15*a*b**6*c**4*d**2*(2*A - B)/(a*d - b*c)**4 - 3*b**7*c**5*d*(2*A - B) \\ & / (a*d - b*c)**4)/(12*A*b**3*d**2 - 6*B*b**3*d**2))/(2*g**2*i**3*(a*d - b*c) \\ & **4) + (-B*a**2*d**2 + 5*B*a*b*c*d + 3*B*a*b*d**2*x + 2*B*b**2*c**2 + 9*B*b \\ & **2*c*d*x + 6*B*b**2*d**2*x**2)*\log(e*(a + b*x)/(c + d*x))/(2*a**4*c**2*d** \\ & 3*g**2*i**3 + 4*a**4*c*d**4*g**2*i**3*x + 2*a**4*d**5*g**2*i**3*x**2 - 6*a \\ & **3*b*c**3*d**2*g**2*i**3 - 10*a**3*b*c**2*d**3*g**2*i**3*x - 2*a**3*b*c*d** \\ & 4*g**2*i**3*x**2 + 2*a**3*b*d**5*g**2*i**3*x**3 + 6*a**2*b**2*c**4*d*g**2*i \\ & **3 + 6*a**2*b**2*c**3*d**2*g**2*i**3*x - 6*a**2*b**2*c**2*d**3*g**2*i**3*x \\ & **2 - 6*a**2*b**2*c*d**4*g**2*i**3*x**3 - 2*a*b**3*c**5*g**2*i**3 + 2*a*b** \\ & 3*c**4*d*g**2*i**3*x + 10*a*b**3*c**3*d**2*g**2*i**3*x**2 + 6*a*b**3*c**2*d \\ & **3*g**2*i**3*x**3 - 2*b**4*c**5*g**2*i**3*x - 4*b**4*c**4*d*g**2*i**3*x**2 \\ & - 2*b**4*c**3*d**2*g**2*i**3*x**3) + (-2*A*a**2*d**2 + 10*A*a*b*c*d + 4*A* \\ & b**2*c**2 + B*a**2*d**2 - 11*B*a*b*c*d + 4*B*b**2*c**2 + x**2*(12*A*b**2*d \\ & **2 - 6*B*b**2*d**2) + x*(6*A*a*b*d**2 + 18*A*b**2*c*d - 9*B*a*b*d**2 - 3*B* \\ & b**2*c*d))/(4*a**4*c**2*d**3*g**2*i**3 - 12*a**3*b*c**3*d**2*g**2*i**3 + 12 \\ & *a**2*b**2*c**4*d*g**2*i**3 - 4*a*b**3*c**5*g**2*i**3 + x**3*(4*a**3*b*d**5 \\ & *g**2*i**3 - 12*a**2*b**2*c*d**4*g**2*i**3 + 12*a*b**3*c**2*d**3*g**2*i**3 \\ & - 4*b**4*c**3*d**2*g**2*i**3) + x**2*(4*a**4*d**5*g**2*i**3 - 4*a**3*b*c*d \\ & **4*g**2*i**3 - 12*a**2*b**2*c**2*d**3*g**2*i**3 + 20*a*b**3*c**3*d**2*g**2* \\ & i**3 - 8*b**4*c**4*d*g**2*i**3) + x*(8*a**4*c*d**4*g**2*i**3 - 20*a**3*b*c* \\ & **2*d**3*g**2*i**3 + 12*a**2*b**2*c**3*d**2*g**2*i**3 + 4*a*b**3*c**4*d*g**2 \\ & i**3 - 4*b**4*c**5*g**2*i**3)) \end{aligned}$$

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{B \log\left(\frac{(bx+a)e}{dx+c}\right) + A}{(bgx + ag)^2 (dix + ci)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)/((b*g*x + a*g)^2*(d*i*x + c*i)^3), x)
```

$$3.53 \quad \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^3(ci+dix)^3} dx$$

**Optimal.** Leaf size=463

$$\frac{6b^2d^2 \log\left(\frac{a+bx}{c+dx}\right) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{g^3i^3(bc-ad)^5} - \frac{b^4(c+dx)^2 \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{2g^3i^3(a+bx)^2(bc-ad)^5} + \frac{4b^3d(c+dx) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{g^3i^3(a+bx)(bc-ad)^5} - \frac{4bd^3(a+bx) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{g^3i^3(bc-ad)^5}$$

[Out]  $-(B*d^4*(a + b*x)^2)/(4*(b*c - a*d)^5*g^3*i^3*(c + d*x)^2) + (4*b*B*d^3*(a + b*x))/((b*c - a*d)^5*g^3*i^3*(c + d*x)) + (4*b^3*B*d*(c + d*x))/((b*c - a*d)^5*g^3*i^3*(a + b*x)) - (b^4*B*(c + d*x)^2)/(4*(b*c - a*d)^5*g^3*i^3*(a + b*x)^2) - (3*b^2*B*d^2*Log[(a + b*x)/(c + d*x)]^2)/((b*c - a*d)^5*g^3*i^3*(c + d*x)) + (d^4*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^5*g^3*i^3*(c + d*x)^2) - (4*b*d^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^5*g^3*i^3*(c + d*x)) + (4*b^3*d*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^5*g^3*i^3*(a + b*x)) - (b^4*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^5*g^3*i^3*(a + b*x)^2) + (6*b^2*d^2*Log[(a + b*x)/(c + d*x)]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^5*g^3*i^3)$

**Rubi [C]** time = 1.40576, antiderivative size = 673, normalized size of antiderivative = 1.45, number of steps used = 36, number of rules used = 11, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.275$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{6b^2Bd^2 \text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{g^3i^3(bc-ad)^5} + \frac{6b^2Bd^2 \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{g^3i^3(bc-ad)^5} + \frac{6b^2d^2 \log(a+bx) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{g^3i^3(bc-ad)^5} - \frac{6b^2d^2 \log(c+dx) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{g^3i^3(bc-ad)^5}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])]/((a\*g + b\*g\*x)^3\*(c\*i + d\*i\*x)^3), x]

[Out]  $-(b^2*B)/(4*(b*c - a*d)^3*g^3*i^3*(a + b*x)^2) + (7*b^2*B*d)/(2*(b*c - a*d)^4*g^3*i^3*(a + b*x)) - (B*d^2)/(4*(b*c - a*d)^3*g^3*i^3*(c + d*x)^2) - (7*b*B*d^2)/(2*(b*c - a*d)^4*g^3*i^3*(c + d*x)) - (3*b^2*B*d^2*Log[a + b*x]^2)/((b*c - a*d)^5*g^3*i^3) - (b^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^3*g^3*i^3*(a + b*x)^2) + (3*b^2*d*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^4*g^3*i^3*(a + b*x)) + (d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^3*g^3*i^3*(c + d*x)^2) + (3*b*d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^4*g^3*i^3*(c + d*x)) + (6*b^2*d^2*Log[a + b*x])/((b*c - a*d)^4*g^3*i^3*(c + d*x)) + (6*b^2*d^2*Log[a + b*x])/((b*c - a*d)^4*g^3*i^3*(c + d*x))$

$$\begin{aligned}
& + b*x]*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^5*g^3*i^3) + (6* \\
& b^2*B*d^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/((b*c - a*d)^5*g^ \\
& 3*i^3) - (6*b^2*d^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])*\text{Log}[c + d*x])/((b* \\
& c - a*d)^5*g^3*i^3) - (3*b^2*B*d^2*\text{Log}[c + d*x]^2)/((b*c - a*d)^5*g^3*i^3) \\
& + (6*b^2*B*d^2*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)]))/((b*c - a*d)^5* \\
& g^3*i^3) + (6*b^2*B*d^2*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a \\
& *d)^5*g^3*i^3) + (6*b^2*B*d^2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]))/((b*c \\
& - a*d)^5*g^3*i^3)
\end{aligned}$$

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]

```

### Rule 2525

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]

```

### Rule 12

```

Int[(a_.)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_.)*(v_) /; FreeQ[b, x]]

```

### Rule 44

```

Int[((a_.) + (b_.)*(x_.))^(m_.)*((c_.) + (d_.)*(x_.))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])

```

### Rule 2524

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_.)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol]
:= With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n]]^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)
*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)
^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps



$$\begin{aligned}
\int \frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(53c + 53dx)^3 (ag + bgx)^3} dx &= \int \left( \frac{b^3 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{148877(bc - ad)^3 g^3 (a + bx)^3} - \frac{3b^3 d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{148877(bc - ad)^4 g^3 (a + bx)^2} + \frac{6b^3 d^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{148877(bc - ad)^5 g^3} \right) dx \\
&= \frac{(6b^3 d^2) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx} dx}{148877(bc - ad)^5 g^3} - \frac{(6b^2 d^3) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx} dx}{148877(bc - ad)^5 g^3} - \frac{(3b^3 d) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2} dx}{148877(bc - ad)^4 g^3} \\
&= -\frac{b^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{297754(bc - ad)^3 g^3 (a + bx)^2} + \frac{3b^2 d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{148877(bc - ad)^4 g^3 (a + bx)} + \frac{d^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{297754(bc - ad)^3 g^3} \\
&= -\frac{b^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{297754(bc - ad)^3 g^3 (a + bx)^2} + \frac{3b^2 d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{148877(bc - ad)^4 g^3 (a + bx)} + \frac{d^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{297754(bc - ad)^3 g^3} \\
&= -\frac{b^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{297754(bc - ad)^3 g^3 (a + bx)^2} + \frac{3b^2 d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{148877(bc - ad)^4 g^3 (a + bx)} + \frac{d^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{297754(bc - ad)^3 g^3} \\
&= -\frac{b^2 B}{595508(bc - ad)^3 g^3 (a + bx)^2} + \frac{7b^2 B d}{297754(bc - ad)^4 g^3 (a + bx)} - \frac{B d^2}{595508(bc - ad)^3 g^3} \\
&= -\frac{b^2 B}{595508(bc - ad)^3 g^3 (a + bx)^2} + \frac{7b^2 B d}{297754(bc - ad)^4 g^3 (a + bx)} - \frac{B d^2}{595508(bc - ad)^3 g^3} \\
&= -\frac{b^2 B}{595508(bc - ad)^3 g^3 (a + bx)^2} + \frac{7b^2 B d}{297754(bc - ad)^4 g^3 (a + bx)} - \frac{B d^2}{595508(bc - ad)^3 g^3} \\
&= -\frac{b^2 B}{595508(bc - ad)^3 g^3 (a + bx)^2} + \frac{7b^2 B d}{297754(bc - ad)^4 g^3 (a + bx)} - \frac{B d^2}{595508(bc - ad)^3 g^3}
\end{aligned}$$

**Mathematica [C]** time = 1.27403, size = 533, normalized size = 1.15

$$\frac{12b^2 B d^2 \left( \log(a + bx) \left( \log(a + bx) - 2 \log\left(\frac{b(c+dx)}{bc-ad}\right) \right) - 2 \text{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) \right) - 12b^2 B d^2 \left( 2 \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right) + \log\left(\frac{b(c+dx)}{bc-ad}\right) \right)}{1}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x]))/((a*g + b*g*x)^3*(c*i + d*i*x)^3), x]
```

```
[Out] -((b^2*B*(b*c - a*d)^2)/(a + b*x)^2 - (12*b^3*B*c*d)/(a + b*x) + (12*a*b^2*B*d^2)/(a + b*x) - (2*b^2*B*d*(b*c - a*d))/(a + b*x) + (B*d^2*(b*c - a*d)^2)/(c + d*x)^2 + (12*b^2*B*c*d^2)/(c + d*x) - (12*a*b*B*d^3)/(c + d*x) + (2*b*B*d^2*(b*c - a*d))/(c + d*x) + (2*b^2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a + b*x)^2 - (12*b^2*d*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a + b*x) - (2*d^2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c + d*x)^2 - (12*b*d^2*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c + d*x) - 24*b^2*d^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 24*b^2*d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + 12*b^2*B*d^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-b*c) + a*d]) - 12*b^2*B*d^2*((2*Log[(d*(a + b*x))/(-b*c) + a*d]) - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)))/(4*(b*c - a*d)^5*g^3*i^3)
```

**Maple [B]** time = 0.058, size = 2182, normalized size = 4.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x)
```

```
[Out] 7/2*d^3/i^3/(a*d-b*c)^6/g^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*a-7/2*d^2/i^3/(a*d-b*c)^6/g^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3*c+6*d^2/i^3/(a*d-b*c)^6/g^3*A*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-3*d^3/i^3/(a*d-b*c)^6/g^3*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+3*d^2/i^3/(a*d-b*c)^6/g^3*B*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-1/2*d^5/i^3/(a*d-b*c)^6/g^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^3-6*d^3/i^3/(a*d-b*c)^6/g^3*A*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+1/2*d^2/i^3/(a*d-b*c)^6/g^3*A/(d*x+c)^2*b^3*c^3-1/4*d^2/i^3/(a*d-b*c)^6/g^3*B/(d*x+c)^2*b^3*c^3-1/2*e^2/i^3/(a*d-b*c)^6/g^3*A*b^5/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^2*c-1/4*e^2/i^3/(a*d-b*c)^6/g^3*B*b^5/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^2*c+3*d^4/i^3/(a*d-b*c)^6/g^3*A*b/(d*x+c)*a^2-7/2*d^2/i^3/(a*d-b*c)^6/g^3*B*b^3/(d*x+c)*c^2-7/2*d^4/i^3/(a*d-b*c)^6/g^3*B*b/(d*x+c)*a^2+3*d^2/i^3/(a*d-b*c)^6/g^3*A*b^3/(d*x+c)*c^2-15/4*d^3/i^3/(a*d-b*c)^6/g^3*B*b^2*a+15/4*d^2/i^3/(a*d-b*c)^6/g^3*B*b^3*c+7/2*d^3/i^3/(a*d-b*c)^6/g^3*A*b^2*a-7/2*d^2/i^3/(a*d-b*c)^6/g^3*A*b^3*c-6*d^3/i^3/(a*d-b*c)^6/g^3*A*b^2/(d*x+c)*a*c+1/2*d^2/i^3/(a*d-b*c)^6/g^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*b^3*c^3-6*d^3/i^3/(a*d-b*c)^6/g^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2/(d*x+c)*c*a-4*e*d^2/i^3/(a*d-b*c)^6/g^3*B*b^3/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+4*e*d/i^3/(a*d-b*c)^6/g^3*B*b^4/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+1/2*e^2*d/i^3/(a*d-b*c)^6/g^3*B*b^4/(b*e/d+e/(d
```

$$\begin{aligned} & (x+c)^a e/d/(d*x+c)*b*c)^2 * \ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)) * a^{3/2} d^4/i^3 / (a*d-b*c)^6 / g^3 * B * \ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)) / (d*x+c)^2 * a^2 * b*c - 3/2 * d^3/i^3 / (a*d-b*c)^6 / g^3 * A / (d*x+c)^2 * a * b^2 * c^2 - 3/4 * d^4/i^3 / (a*d-b*c)^6 / g^3 * B / (d*x+c)^2 * a^2 * b*c + 1/4 * d^5/i^3 / (a*d-b*c)^6 / g^3 * B / (d*x+c)^2 * a^3 - 1/2 * d^5/i^3 / (a*d-b*c)^6 / g^3 * A / (d*x+c)^2 * a^3 + 1/2 * e^2 * d/i^3 / (a*d-b*c)^6 / g^3 * A * b^4 / (b*e/d+e/(d*x+c))^a * e/d/(d*x+c)*b*c)^2 * a^3 * d^2/i^3 / (a*d-b*c)^6 / g^3 * B * \ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)) * b^3 / (d*x+c) * c^2 + 3 * d^4/i^3 / (a*d-b*c)^6 / g^3 * B * \ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)) * b / (d*x+c) * a^2 + 1/4 * e^2 * d/i^3 / (a*d-b*c)^6 / g^3 * B * b^4 / (b*e/d+e/(d*x+c))^a * e/d/(d*x+c)*b*c)^2 * a^7 * d^3/i^3 / (a*d-b*c)^6 / g^3 * B * b^2 / (d*x+c) * c * a^3 / 4 * d^3/i^3 / (a*d-b*c)^6 / g^3 * B / (d*x+c)^2 * b^2 * c^2 * a - 4 * e * d^2/i^3 / (a*d-b*c)^6 / g^3 * A * b^3 / (b*e/d+e/(d*x+c))^a * e/d/(d*x+c)*b*c)^a * a^4 * e * d/i^3 / (a*d-b*c)^6 / g^3 * A * b^4 / (b*e/d+e/(d*x+c))^a * e/d/(d*x+c)*b*c)^c - 4 * e * d^2/i^3 / (a*d-b*c)^6 / g^3 * B * b^3 / (b*e/d+e/(d*x+c))^a * e/d/(d*x+c)*b*c)^a * a^4 * e * d/i^3 / (a*d-b*c)^6 / g^3 * B * b^4 / (b*e/d+e/(d*x+c))^a * e/d/(d*x+c)*b*c)^c + 3/2 * d^4/i^3 / (a*d-b*c)^6 / g^3 * A / (d*x+c)^2 * a^2 * b*c - 1/2 * e^2/i^3 / (a*d-b*c)^6 / g^3 * B * b^5 / (b*e/d+e/(d*x+c))^a * e/d/(d*x+c)*b*c)^2 * \ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)) * c - 3/2 * d^3/i^3 / (a*d-b*c)^6 / g^3 * B * \ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)) / (d*x+c)^2 * a * b^2 * c^2 \end{aligned}$$

**Maxima [B]** time = 2.0952, size = 3213, normalized size = 6.94

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)^3/(d\*i\*x+c\*i)^3,x, algorithm="maxima")

[Out] 
$$\begin{aligned} & 1/2 * B * ((12 * b^3 * d^3 * x^3 - b^3 * c^3 + 7 * a * b^2 * c^2 * d + 7 * a^2 * b * c * d^2 - a^3 * d^3 + 18 * (b^3 * c * d^2 + a * b^2 * d^3) * x^2 + 4 * (b^3 * c^2 * d + 7 * a * b^2 * c * d^2 + a^2 * b * d^3) * x) / ((b^6 * c^4 * d^2 - 4 * a * b^5 * c^3 * d^3 + 6 * a^2 * b^4 * c^2 * d^4 - 4 * a^3 * b^3 * c * d^5 + a^4 * b^2 * d^6) * g^3 * i^3 * x^4 + 2 * (b^6 * c^5 * d - 3 * a * b^5 * c^4 * d^2 + 2 * a^2 * b^4 * c^3 * d^3 + 2 * a^3 * b^3 * c^2 * d^4 - 3 * a^4 * b^2 * c * d^5 + a^5 * b * d^6) * g^3 * i^3 * x^3 + (b^6 * c^6 - 9 * a^2 * b^4 * c^4 * d^2 + 16 * a^3 * b^3 * c^3 * d^3 - 9 * a^4 * b^2 * c^2 * d^4 + a^6 * d^6) * g^3 * i^3 * x^2 + 2 * (a * b^5 * c^6 - 3 * a^2 * b^4 * c^5 * d + 2 * a^3 * b^3 * c^4 * d^2 + 2 * a^4 * b^2 * c^3 * d^3 - 3 * a^5 * b * c^2 * d^4 + a^6 * c * d^5) * g^3 * i^3 * x + (a^2 * b^4 * c^6 - 4 * a^3 * b^3 * c^5 * d + 6 * a^4 * b^2 * c^4 * d^2 - 4 * a^5 * b * c^3 * d^3 + a^6 * c^2 * d^4) * g^3 * i^3) + 12 * b^2 * d^2 * \log(b * x + a) / ((b^5 * c^5 - 5 * a * b^4 * c^4 * d + 10 * a^2 * b^3 * c^3 * d^2 - 10 * a^3 * b^2 * c^2 * d^3 + 5 * a^4 * b * c * d^4 - a^5 * d^5) * g^3 * i^3) - 12 * b^2 * d^2 * \log(d * x + c) / ((b^5 * c^5 - 5 * a * b^4 * c^4 * d + 10 * a^2 * b^3 * c^3 * d^2 - 10 * a^3 * b^2 * c^2 * d^3 + 5 * a^4 * b * c * d^4 - a^5 * d^5) * g^3 * i^3)) * \log(b * e * x / (d * x + c) + a * e / (d * x + c)) + 1/2 * A * ((12 * b^3 * d^3 * x^3 - b^3 * c^3 + 7 * a * b^2 * c^2 * d + 7 * a^2 * b * c * d^2 - a^3 * d^3 + 18 * (b^3 * c * d^2 + a * b^2 * d^3) * x^2 + 4 * (b^3 * c^2 * d + 7 * a * b^2 * c * d^2 + a^2 * b * d^3) * x) \end{aligned}$$

$$\begin{aligned} & ) / ((b^6 c^4 d^2 - 4 a b^5 c^3 d^3 + 6 a^2 b^4 c^2 d^4 - 4 a^3 b^3 c d^5 + a^4 b^2 d^6) g^3 i^3 x^4 + 2 (b^6 c^5 d - 3 a b^5 c^4 d^2 + 2 a^2 b^4 c^3 d^3 + 2 a^3 b^3 c^2 d^4 - 3 a^4 b^2 c d^5 + a^5 b d^6) g^3 i^3 x^3 + (b^6 c^6 - 9 a^2 b^4 c^4 d^2 + 16 a^3 b^3 c^3 d^3 - 9 a^4 b^2 c^2 d^4 + a^6 d^6) g^3 i^3 x^2 + 2 (a b^5 c^6 - 3 a^2 b^4 c^5 d + 2 a^3 b^3 c^4 d^2 + 2 a^4 b^2 c^3 d^3 - 3 a^5 b c^2 d^4 + a^6 c d^5) g^3 i^3 x + (a^2 b^4 c^6 - 4 a^3 b^3 c^5 d + 6 a^4 b^2 c^4 d^2 - 4 a^5 b c^3 d^3 + a^6 c^2 d^4) g^3 i^3) + 12 b^2 d^2 \log(b x + a) / ((b^5 c^5 - 5 a b^4 c^4 d + 10 a^2 b^3 c^3 d^2 - 10 a^3 b^2 c^2 d^3 + 5 a^4 b c d^4 - a^5 d^5) g^3 i^3) - 12 b^2 d^2 \log(d x + c) / ((b^5 c^5 - 5 a b^4 c^4 d + 10 a^2 b^3 c^3 d^2 - 10 a^3 b^2 c^2 d^3 + 5 a^4 b c d^4 - a^5 d^5) g^3 i^3) - 1/4 (b^4 c^4 - 16 a b^3 c^3 d + 30 a^2 b^2 c^2 d^2 - 16 a^3 b c d^3 + a^4 d^4 - 12 (b^4 c^2 d^2 - 2 a b^3 c d^3 + a^2 b^2 d^4) x^2 + 12 (b^4 d^4 x^4 + a^2 b^2 c^2 d^2 + 2 (b^4 c d^3 + a b^3 d^4) x^3 + (b^4 c^2 d^2 + 4 a b^3 c d^3 + a^2 b^2 d^4) x^2 + 2 (a b^3 c^2 d^2 + a^2 b^2 c d^3) x) \log(b x + a)^2 - 24 (b^4 d^4 x^4 + a^2 b^2 c^2 d^2 + 2 (b^4 c d^3 + a b^3 d^4) x^3 + (b^4 c^2 d^2 + 4 a b^3 c d^3 + a^2 b^2 d^4) x^2 + 2 (a b^3 c^2 d^2 + a^2 b^2 c d^3) x) \log(b x + a) \log(d x + c) + 12 (b^4 d^4 x^4 + a^2 b^2 c^2 d^2 + 2 (b^4 c d^3 + a b^3 d^4) x^3 + (b^4 c^2 d^2 + 4 a b^3 c d^3 + a^2 b^2 d^4) x^2 + 2 (a b^3 c^2 d^2 + a^2 b^2 c d^3) x) \log(d x + c)^2 - 12 (b^4 c^3 d - a b^3 c^2 d^2 - a^2 b^2 c d^3 + a^3 b d^4) x) * B / (a^2 b^5 c^7 g^3 i^3 - 5 a^3 b^4 c^6 d g^3 i^3 + 10 a^4 b^3 c^5 d^2 g^3 i^3 - 10 a^5 b^2 c^4 d^3 g^3 i^3 + 5 a^6 b c^3 d^4 g^3 i^3 - a^7 c^2 d^5 g^3 i^3 + (b^7 c^5 d^2 g^3 i^3 - 5 a b^6 c^4 d^3 g^3 i^3 + 10 a^2 b^5 c^3 d^4 g^3 i^3 - 10 a^3 b^4 c^2 d^5 g^3 i^3 + 5 a^4 b^3 c d^6 g^3 i^3 - a^5 b^2 d^7 g^3 i^3) x^4 + 2 (b^7 c^6 d g^3 i^3 - 4 a b^6 c^5 d^2 g^3 i^3 + 5 a^2 b^5 c^4 d^3 g^3 i^3 - 5 a^4 b^3 c^2 d^5 g^3 i^3 + 4 a^5 b^2 c d^6 g^3 i^3 - a^6 b d^7 g^3 i^3) x^3 + (b^7 c^7 g^3 i^3 - a b^6 c^6 d g^3 i^3 - 9 a^2 b^5 c^5 d^2 g^3 i^3 + 25 a^3 b^4 c^4 d^3 g^3 i^3 - 25 a^4 b^3 c^3 d^4 g^3 i^3 + 9 a^5 b^2 c^2 d^5 g^3 i^3 + a^6 b c d^6 g^3 i^3 - a^7 d^7 g^3 i^3) x^2 + 2 (a b^6 c^7 g^3 i^3 - 4 a^2 b^5 c^6 d g^3 i^3 + 5 a^3 b^4 c^5 d^2 g^3 i^3 - 5 a^5 b^2 c^3 d^4 g^3 i^3 + 4 a^6 b c^2 d^5 g^3 i^3 - a^7 c d^6 g^3 i^3) x) ) * x) \end{aligned}$$


---

**Fricas [B]** time = 0.6042, size = 2037, normalized size = 4.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x, algorithm="fricas")
```

```
[Out] -1/4*((2*A + B)*b^4*c^4 - 16*(A + B)*a*b^3*c^3*d + 30*B*a^2*b^2*c^2*d^2 + 1
6*(A - B)*a^3*b*c*d^3 - (2*A - B)*a^4*d^4 - 24*(A*b^4*c*d^3 - A*a*b^3*d^4)*
x^3 - 12*((3*A + B)*b^4*c^2*d^2 - 2*B*a*b^3*c*d^3 - (3*A - B)*a^2*b^2*d^4)*
x^2 - 12*(B*b^4*d^4*x^4 + B*a^2*b^2*c^2*d^2 + 2*(B*b^4*c*d^3 + B*a*b^3*d^4)
*x^3 + (B*b^4*c^2*d^2 + 4*B*a*b^3*c*d^3 + B*a^2*b^2*d^4)*x^2 + 2*(B*a*b^3*c
^2*d^2 + B*a^2*b^2*c*d^3)*x)*log((b*e*x + a*e)/(d*x + c))^2 - 4*((2*A + 3*B
)*b^4*c^3*d + 3*(4*A - B)*a*b^3*c^2*d^2 - 3*(4*A + B)*a^2*b^2*c*d^3 - (2*A
- 3*B)*a^3*b*d^4)*x - 2*(12*A*b^4*d^4*x^4 - B*b^4*c^4 + 8*B*a*b^3*c^3*d + 1
2*A*a^2*b^2*c^2*d^2 - 8*B*a^3*b*c*d^3 + B*a^4*d^4 + 12*((2*A + B)*b^4*c*d^3
+ (2*A - B)*a*b^3*d^4)*x^3 + 6*((2*A + 3*B)*b^4*c^2*d^2 + 8*A*a*b^3*c*d^3
+ (2*A - 3*B)*a^2*b^2*d^4)*x^2 + 4*(B*b^4*c^3*d + 6*(A + B)*a*b^3*c^2*d^2 +
6*(A - B)*a^2*b^2*c*d^3 - B*a^3*b*d^4)*x)*log((b*e*x + a*e)/(d*x + c)))/((
b^7*c^5*d^2 - 5*a*b^6*c^4*d^3 + 10*a^2*b^5*c^3*d^4 - 10*a^3*b^4*c^2*d^5 + 5
*a^4*b^3*c*d^6 - a^5*b^2*d^7)*g^3*i^3*x^4 + 2*(b^7*c^6*d - 4*a*b^6*c^5*d^2
+ 5*a^2*b^5*c^4*d^3 - 5*a^4*b^3*c^2*d^5 + 4*a^5*b^2*c*d^6 - a^6*b*d^7)*g^3*
i^3*x^3 + (b^7*c^7 - a*b^6*c^6*d - 9*a^2*b^5*c^5*d^2 + 25*a^3*b^4*c^4*d^3 -
25*a^4*b^3*c^3*d^4 + 9*a^5*b^2*c^2*d^5 + a^6*b*c*d^6 - a^7*d^7)*g^3*i^3*x
^2 + 2*(a*b^6*c^7 - 4*a^2*b^5*c^6*d + 5*a^3*b^4*c^5*d^2 - 5*a^5*b^2*c^3*d^4
+ 4*a^6*b*c^2*d^5 - a^7*c*d^6)*g^3*i^3*x + (a^2*b^5*c^7 - 5*a^3*b^4*c^6*d +
10*a^4*b^3*c^5*d^2 - 10*a^5*b^2*c^4*d^3 + 5*a^6*b*c^3*d^4 - a^7*c^2*d^5)*g
^3*i^3)
```

---

**Sympy [B]** time = 65.1957, size = 2106, normalized size = 4.55

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**3/(d*i*x+c*i)**3,x)
```

```
[Out] 6*A*b**2*d**2*log(x + (-6*A*a**6*b**2*d**8/(a*d - b*c)**5 + 36*A*a**5*b**3*
c*d**7/(a*d - b*c)**5 - 90*A*a**4*b**4*c**2*d**6/(a*d - b*c)**5 + 120*A*a**
3*b**5*c**3*d**5/(a*d - b*c)**5 - 90*A*a**2*b**6*c**4*d**4/(a*d - b*c)**5 +
36*A*a*b**7*c**5*d**3/(a*d - b*c)**5 + 6*A*a*b**2*d**3 - 6*A*b**8*c**6*d**
2/(a*d - b*c)**5 + 6*A*b**3*c*d**2)/(12*A*b**3*d**3))/(g**3*i**3*(a*d - b*c
)**5) - 6*A*b**2*d**2*log(x + (6*A*a**6*b**2*d**8/(a*d - b*c)**5 - 36*A*a**
5*b**3*c*d**7/(a*d - b*c)**5 + 90*A*a**4*b**4*c**2*d**6/(a*d - b*c)**5 - 12
0*A*a**3*b**5*c**3*d**5/(a*d - b*c)**5 + 90*A*a**2*b**6*c**4*d**4/(a*d - b*
c)**5 - 36*A*a*b**7*c**5*d**3/(a*d - b*c)**5 + 6*A*a*b**2*d**3 + 6*A*b**8*c
**6*d**2/(a*d - b*c)**5 + 6*A*b**3*c*d**2)/(12*A*b**3*d**3))/(g**3*i**3*(a
d - b*c)**5) - 3*B*b**2*d**2*log(e*(a + b*x)/(c + d*x))**2/(a**5*d**5*g**3*
i**3 - 5*a**4*b*c*d**4*g**3*i**3 + 10*a**3*b**2*c**2*d**3*g**3*i**3 - 10*a*
```

```

*2*b**3*c**3*d**2*g**3*i**3 + 5*a*b**4*c**4*d*g**3*i**3 - b**5*c**5*g**3*i**
*3) + (-B*a**3*d**3 + 7*B*a**2*b*c*d**2 + 4*B*a**2*b*d**3*x + 7*B*a*b**2*c*
*2*d + 28*B*a*b**2*c*d**2*x + 18*B*a*b**2*d**3*x**2 - B*b**3*c**3 + 4*B*b**
3*c**2*d*x + 18*B*b**3*c*d**2*x**2 + 12*B*b**3*d**3*x**3)*log(e*(a + b*x)/(
c + d*x))/(2*a**6*c**2*d**4*g**3*i**3 + 4*a**6*c*d**5*g**3*i**3*x + 2*a**6*
d**6*g**3*i**3*x**2 - 8*a**5*b*c**3*d**3*g**3*i**3 - 12*a**5*b*c**2*d**4*g*
*3*i**3*x + 4*a**5*b*d**6*g**3*i**3*x**3 + 12*a**4*b**2*c**4*d**2*g**3*i**3
+ 8*a**4*b**2*c**3*d**3*g**3*i**3*x - 18*a**4*b**2*c**2*d**4*g**3*i**3*x**
2 - 12*a**4*b**2*c*d**5*g**3*i**3*x**3 + 2*a**4*b**2*d**6*g**3*i**3*x**4 -
8*a**3*b**3*c**5*d*g**3*i**3 + 8*a**3*b**3*c**4*d**2*g**3*i**3*x + 32*a**3*
b**3*c**3*d**3*g**3*i**3*x**2 + 8*a**3*b**3*c**2*d**4*g**3*i**3*x**3 - 8*a*
*3*b**3*c*d**5*g**3*i**3*x**4 + 2*a**2*b**4*c**6*g**3*i**3 - 12*a**2*b**4*c
**5*d*g**3*i**3*x - 18*a**2*b**4*c**4*d**2*g**3*i**3*x**2 + 8*a**2*b**4*c**
3*d**3*g**3*i**3*x**3 + 12*a**2*b**4*c**2*d**4*g**3*i**3*x**4 + 4*a*b**5*c*
*6*g**3*i**3*x - 12*a*b**5*c**4*d**2*g**3*i**3*x**3 - 8*a*b**5*c**3*d**3*g*
*3*i**3*x**4 + 2*b**6*c**6*g**3*i**3*x**2 + 4*b**6*c**5*d*g**3*i**3*x**3 +
2*b**6*c**4*d**2*g**3*i**3*x**4) + (-2*A*a**3*d**3 + 14*A*a**2*b*c*d**2 + 1
4*A*a*b**2*c**2*d - 2*A*b**3*c**3 + 24*A*b**3*d**3*x**3 + B*a**3*d**3 - 15*
B*a**2*b*c*d**2 + 15*B*a*b**2*c**2*d - B*b**3*c**3 + x**2*(36*A*a*b**2*d**3
+ 36*A*b**3*c*d**2 - 12*B*a*b**2*d**3 + 12*B*b**3*c*d**2) + x*(8*A*a**2*b*
d**3 + 56*A*a*b**2*c*d**2 + 8*A*b**3*c**2*d - 12*B*a**2*b*d**3 + 12*B*b**3*
c**2*d))/(4*a**6*c**2*d**4*g**3*i**3 - 16*a**5*b*c**3*d**3*g**3*i**3 + 24*a
**4*b**2*c**4*d**2*g**3*i**3 - 16*a**3*b**3*c**5*d*g**3*i**3 + 4*a**2*b**4*
c**6*g**3*i**3 + x**4*(4*a**4*b**2*d**6*g**3*i**3 - 16*a**3*b**3*c*d**5*g**
3*i**3 + 24*a**2*b**4*c**2*d**4*g**3*i**3 - 16*a*b**5*c**3*d**3*g**3*i**3 +
4*b**6*c**4*d**2*g**3*i**3) + x**3*(8*a**5*b*d**6*g**3*i**3 - 24*a**4*b**2
*c*d**5*g**3*i**3 + 16*a**3*b**3*c**2*d**4*g**3*i**3 + 16*a**2*b**4*c**3*d
**3*g**3*i**3 - 24*a*b**5*c**4*d**2*g**3*i**3 + 8*b**6*c**5*d*g**3*i**3) + x
**2*(4*a**6*d**6*g**3*i**3 - 36*a**4*b**2*c**2*d**4*g**3*i**3 + 64*a**3*b**
3*c**3*d**3*g**3*i**3 - 36*a**2*b**4*c**4*d**2*g**3*i**3 + 4*b**6*c**6*g**3
*i**3) + x*(8*a**6*c*d**5*g**3*i**3 - 24*a**5*b*c**2*d**4*g**3*i**3 + 16*a*
*4*b**2*c**3*d**3*g**3*i**3 + 16*a**3*b**3*c**4*d**2*g**3*i**3 - 24*a**2*b*
*4*c**5*d*g**3*i**3 + 8*a*b**5*c**6*g**3*i**3))

```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{B \log\left(\frac{bx+a}{dx+c}\right) + A}{(bgx + ag)^3 (dix + ci)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)^3/(d\*i\*x+c\*i)^3,x, algor

```
ithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)/((b*g*x + a*g)^3*(d*i*x + c*i)^3), x)
```

$$3.54 \quad \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^4(ci+dix)^3} dx$$

**Optimal.** Leaf size=563

$$\frac{10b^3d^2(c+dx)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^4i^3(a+bx)(bc-ad)^6} - \frac{10b^2d^3 \log\left(\frac{a+bx}{c+dx}\right)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^4i^3(bc-ad)^6} - \frac{b^5(c+dx)^3\left(B \log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3g^4i^3(a+bx)^3(bc-ad)^6} + \frac{5b^2(A+B \log\left(\frac{e(a+bx)}{c+dx}\right))d^3}{(bc-ad)^6g^4i^3} - \frac{4b(A+B \log\left(\frac{e(a+bx)}{c+dx}\right))d^3}{(bc-ad)^6g^4i^3}$$

[Out]  $(B*d^5*(a + b*x)^2)/(4*(b*c - a*d)^6*g^4*i^3*(c + d*x)^2) - (5*b*B*d^4*(a + b*x))/((b*c - a*d)^6*g^4*i^3*(c + d*x)) - (10*b^3*B*d^2*(c + d*x))/((b*c - a*d)^6*g^4*i^3*(a + b*x)) + (5*b^4*B*d*(c + d*x)^2)/(4*(b*c - a*d)^6*g^4*i^3*(a + b*x)^2) - (b^5*B*(c + d*x)^3)/(9*(b*c - a*d)^6*g^4*i^3*(a + b*x)^3) + (5*b^2*B*d^3*Log[(a + b*x)/(c + d*x)]^2)/((b*c - a*d)^6*g^4*i^3) - (d^5*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x])))/(2*(b*c - a*d)^6*g^4*i^3*(c + d*x)^2) + (5*b*d^4*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x])))/((b*c - a*d)^6*g^4*i^3*(c + d*x)) - (10*b^3*d^2*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x])))/((b*c - a*d)^6*g^4*i^3*(a + b*x)) + (5*b^4*d*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x])))/(2*(b*c - a*d)^6*g^4*i^3*(a + b*x)^2) - (b^5*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x])))/(3*(b*c - a*d)^6*g^4*i^3*(a + b*x)^3) - (10*b^2*d^3*Log[(a + b*x)/(c + d*x)]*(A + B*Log[(e*(a + b*x))/(c + d*x])))/((b*c - a*d)^6*g^4*i^3)$

**Rubi [C]** time = 1.69534, antiderivative size = 825, normalized size of antiderivative = 1.47, number of steps used = 40, number of rules used = 11, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.275$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{5b^2B \log^2(a+bx)d^3}{(bc-ad)^6g^4i^3} + \frac{5b^2B \log^2(c+dx)d^3}{(bc-ad)^6g^4i^3} - \frac{10b^2B \log(a+bx)d^3}{3(bc-ad)^6g^4i^3} - \frac{10b^2 \log(a+bx)\left(A+B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)d^3}{(bc-ad)^6g^4i^3} - \frac{4b\left(A+B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)d^3}{(bc-ad)^6g^4i^3}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]])/((a\*g + b\*g\*x)^4\*(c\*i + d\*i\*x)^3), x]

[Out]  $-(b^2*B)/(9*(b*c - a*d)^3*g^4*i^3*(a + b*x)^3) + (11*b^2*B*d)/(12*(b*c - a*d)^4*g^4*i^3*(a + b*x)^2) - (47*b^2*B*d^2)/(6*(b*c - a*d)^5*g^4*i^3*(a + b*x)) + (B*d^3)/(4*(b*c - a*d)^4*g^4*i^3*(c + d*x)^2) + (9*b*B*d^3)/(2*(b*c - a*d)^5*g^4*i^3*(c + d*x)) - (10*b^2*B*d^3*Log[a + b*x])/(3*(b*c - a*d)^6*g^4*i^3) + (5*b^2*B*d^3*Log[a + b*x]^2)/((b*c - a*d)^6*g^4*i^3) - (b^2*(A + B*Log[(e*(a + b*x))/(c + d*x])))/(3*(b*c - a*d)^3*g^4*i^3*(a + b*x)^3) + (3$



$$\frac{b^2 d (A + B \log[(e(a + bx))/(c + dx)])}{(2(b^2 c - a^2 d)^4 g^4 i^3 (a + bx)^2) - (6 b^2 d^2 (A + B \log[(e(a + bx))/(c + dx)])) / ((b^2 c - a^2 d)^5 g^4 i^3 (a + bx)) - (d^3 (A + B \log[(e(a + bx))/(c + dx)])) / (2(b^2 c - a^2 d)^4 g^4 i^3 (c + dx)^2) - (4 b^2 d^3 (A + B \log[(e(a + bx))/(c + dx)])) / ((b^2 c - a^2 d)^5 g^4 i^3 (c + dx)) - (10 b^2 d^3 \log[a + bx] (A + B \log[(e(a + bx))/(c + dx)])) / ((b^2 c - a^2 d)^6 g^4 i^3 + (10 b^2 B d^3 \log[c + dx])) / (3(b^2 c - a^2 d)^6 g^4 i^3 - (10 b^2 B d^3 \log[-(d(a + bx))/(b^2 c - a^2 d)]) \log[c + dx]) / ((b^2 c - a^2 d)^6 g^4 i^3 + (10 b^2 d^3 (A + B \log[(e(a + bx))/(c + dx)]) \log[c + dx]) / ((b^2 c - a^2 d)^6 g^4 i^3 + (5 b^2 B d^3 \log[c + dx]^2) / ((b^2 c - a^2 d)^6 g^4 i^3 - (10 b^2 B d^3 \log[a + bx] \log[(b^2 c - a^2 d) / (b^2 c - a^2 d)]) / ((b^2 c - a^2 d)^6 g^4 i^3 - (10 b^2 B d^3 \text{PolyLog}[2, -(d(a + bx))/(b^2 c - a^2 d)]) / ((b^2 c - a^2 d)^6 g^4 i^3 - (10 b^2 B d^3 \text{PolyLog}[2, (b^2 c - a^2 d) / (b^2 c - a^2 d)]) / ((b^2 c - a^2 d)^6 g^4 i^3))$$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.), x_Symbol] := Simp[(((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[(((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_.)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_.)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_.) + (b_.)*(x_.))^(m_.)*((c_.) + (d_.)*(x_.))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_.)), x_S
```

```

ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

```

### Rule 2418

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]

```

### Rule 2390

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]

```

### Rule 2301

```

Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]

```

### Rule 2394

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]

```

### Rule 2393

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]

```

### Rule 2391

```

Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]

```

### Rubi steps

$$\begin{aligned}
\int \frac{A + B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(54c + 54dx)^3(ag + bgx)^4} dx &= \int \left( \frac{b^3 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{157464(bc - ad)^3 g^4 (a + bx)^4} - \frac{b^3 d \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{52488(bc - ad)^4 g^4 (a + bx)^3} + \frac{b^3 d^2 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{26244(bc - ad)^5 g^4 (a + bx)^2} \right) dx \\
&= -\frac{(5b^3 d^3) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx} dx}{78732(bc - ad)^6 g^4} + \frac{(5b^2 d^4) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx} dx}{78732(bc - ad)^6 g^4} + \frac{(b^3 d^2) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2} dx}{26244(bc - ad)^5 g^4} \\
&= -\frac{b^2 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{472392(bc - ad)^3 g^4 (a + bx)^3} + \frac{b^2 d \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{104976(bc - ad)^4 g^4 (a + bx)^2} - \frac{b^2 d^2 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{26244(bc - ad)^5 g^4 (a + bx)} \\
&= -\frac{b^2 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{472392(bc - ad)^3 g^4 (a + bx)^3} + \frac{b^2 d \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{104976(bc - ad)^4 g^4 (a + bx)^2} - \frac{b^2 d^2 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{26244(bc - ad)^5 g^4 (a + bx)} \\
&= -\frac{b^2 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{472392(bc - ad)^3 g^4 (a + bx)^3} + \frac{b^2 d \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{104976(bc - ad)^4 g^4 (a + bx)^2} - \frac{b^2 d^2 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)}{26244(bc - ad)^5 g^4 (a + bx)} \\
&= -\frac{b^2 B}{1417176(bc - ad)^3 g^4 (a + bx)^3} + \frac{11b^2 B d}{1889568(bc - ad)^4 g^4 (a + bx)^2} - \frac{47b^2 B d^2}{944784(bc - ad)^5 g^4 (a + bx)} \\
&= -\frac{b^2 B}{1417176(bc - ad)^3 g^4 (a + bx)^3} + \frac{11b^2 B d}{1889568(bc - ad)^4 g^4 (a + bx)^2} - \frac{47b^2 B d^2}{944784(bc - ad)^5 g^4 (a + bx)} \\
&= -\frac{b^2 B}{1417176(bc - ad)^3 g^4 (a + bx)^3} + \frac{11b^2 B d}{1889568(bc - ad)^4 g^4 (a + bx)^2} - \frac{47b^2 B d^2}{944784(bc - ad)^5 g^4 (a + bx)} \\
&= -\frac{b^2 B}{1417176(bc - ad)^3 g^4 (a + bx)^3} + \frac{11b^2 B d}{1889568(bc - ad)^4 g^4 (a + bx)^2} - \frac{47b^2 B d^2}{944784(bc - ad)^5 g^4 (a + bx)}
\end{aligned}$$

**Mathematica [C]** time = 1.99388, size = 637, normalized size = 1.13

$$-\frac{180b^2 B d^3 \left( \log(a + bx) \left( \log(a + bx) - 2 \log\left(\frac{b(c+dx)}{bc-ad}\right) \right) - 2 \text{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) \right) + 180b^2 B d^3 \left( 2 \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right) \right)}{(a + bx)^3}$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])/((a\*g + b\*g\*x)^4\*(c\*i + d\*i\*x)^3), x]

```
[Out] -((4*b^2*B*(b*c - a*d)^3)/(a + b*x)^3 - (33*b^2*B*d*(b*c - a*d)^2)/(a + b*x)^2 + (216*b^3*B*c*d^2)/(a + b*x) - (216*a*b^2*B*d^3)/(a + b*x) + (66*b^2*B*d^2*(b*c - a*d))/(a + b*x) - (9*B*d^3*(b*c - a*d)^2)/(c + d*x)^2 - (144*b^2*B*c*d^3)/(c + d*x) + (144*a*b*B*d^4)/(c + d*x) - (18*b*B*d^3*(b*c - a*d))/(c + d*x) + 120*b^2*B*d^3*Log[a + b*x] + (12*b^2*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a + b*x)^3 - (54*b^2*d*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a + b*x)^2 + (216*b^2*d^2*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(a + b*x) + (18*d^3*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c + d*x)^2 + (144*b*d^3*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(c + d*x) + 360*b^2*d^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 120*b^2*B*d^3*Log[c + d*x] - 360*b^2*d^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] - 180*b^2*B*d^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-b*c) + a*d]) + 180*b^2*B*d^3*((2*Log[(d*(a + b*x))/(-b*c) + a*d] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(36*(b*c - a*d)^6*g^4*i^3)
```

**Maple [B]** time = 0.054, size = 2616, normalized size = 4.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x)
```

```
[Out] -1/2*d^6/i^3/(a*d-b*c)^7/g^4*A/(d*x+c)^2*a^3-10*e*d^3/i^3/(a*d-b*c)^7/g^4*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-1/3*e^3*d/i^3/(a*d-b*c)^7/g^4*A*b^5/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a+5/4*e^2*d^2/i^3/(a*d-b*c)^7/g^4*B*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a+1/2*d^3/i^3/(a*d-b*c)^7/g^4*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*b^3*c^3+4*d^5/i^3/(a*d-b*c)^7/g^4*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b/(d*x+c)*a^2+1/3*e^3/i^3/(a*d-b*c)^7/g^4*B*b^6/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+5/2*e^2*d^2/i^3/(a*d-b*c)^7/g^4*A*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a-5/4*e^2*d/i^3/(a*d-b*c)^7/g^4*B*b^5/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c+9/2*d^4/i^3/(a*d-b*c)^7/g^4*A*b^2*a-9/2*d^3/i^3/(a*d-b*c)^7/g^4*A*b^3*c-19/4*d^4/i^3/(a*d-b*c)^7/g^4*B*b^2*a+19/4*d^3/i^3/(a*d-b*c)^7/g^4*B*b^3*c-1/2*d^6/i^3/(a*d-b*c)^7/g^4*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^3-5*d^4/i^3/(a*d-b*c)^7/g^4*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+9/2*d^4/i^3/(a*d-b*c)^7/g^4*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*a+5*d^3/i^3/(a*d-b*c)^7/g^4*B*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c+10*d^3/i^3/(a*d-b*c)^7/g^4*A*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-9/2*d^3/i^3/(a*d-b*c)^7/g^4*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3*c-10*d^4/i^3/(a*d-b*c)^7/g^4*A
```

$$\begin{aligned}
& *b^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+4*d^5/i^3/(a*d-b*c)^7/g^4*A*b/(d*x+c) \\
& )*a^2+4*d^3/i^3/(a*d-b*c)^7/g^4*A*b^3/(d*x+c)*c^2-1/4*d^3/i^3/(a*d-b*c)^7/g \\
& ^4*B/(d*x+c)^2*b^3*c^3+1/3*e^3/i^3/(a*d-b*c)^7/g^4*A*b^6/(b*e/d+e/(d*x+c)*a \\
& -e/d/(d*x+c)*b*c)^3*c-9/2*d^3/i^3/(a*d-b*c)^7/g^4*B*b^3/(d*x+c)*c^2-1/3*e^3 \\
& *d/i^3/(a*d-b*c)^7/g^4*B*b^5/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*\ln(b*e/d \\
& +(a*d-b*c)*e/d/(d*x+c))*a+5/2*e^2*d^2/i^3/(a*d-b*c)^7/g^4*B*b^4/(b*e/d+e/(d \\
& *x+c)*a-e/d/(d*x+c)*b*c)^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-10*e*d^3/i^3/( \\
& a*d-b*c)^7/g^4*A*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+10*e*d^2/i^3/(a* \\
& d-b*c)^7/g^4*A*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c-10*e*d^3/i^3/(a*d- \\
& b*c)^7/g^4*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*\ln(b*e/d+(a*d-b*c)*e/d \\
& /d(x+c))*a+10*e*d^2/i^3/(a*d-b*c)^7/g^4*B*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+ \\
& c)*b*c)*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+1/9*e^3/i^3/(a*d-b*c)^7/g^4*B*b^6 \\
& /b(e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*c+1/2*d^3/i^3/(a*d-b*c)^7/g^4*A/(d*x \\
& +c)^2*b^3*c^3-9/2*d^5/i^3/(a*d-b*c)^7/g^4*B*b/(d*x+c)*a^2+1/4*d^6/i^3/(a*d- \\
& b*c)^7/g^4*B/(d*x+c)^2*a^3-1/9*e^3*d/i^3/(a*d-b*c)^7/g^4*B*b^5/(b*e/d+e/(d* \\
& x+c)*a-e/d/(d*x+c)*b*c)^3*a-8*d^4/i^3/(a*d-b*c)^7/g^4*A*b^2/(d*x+c)*c*a-3/2 \\
& *d^4/i^3/(a*d-b*c)^7/g^4*A/(d*x+c)^2*b^2*c^2*a+3/4*d^4/i^3/(a*d-b*c)^7/g^4* \\
& B/(d*x+c)^2*b^2*c^2*a-3/4*d^5/i^3/(a*d-b*c)^7/g^4*B/(d*x+c)^2*a^2*b*c+9*d^4 \\
& /i^3/(a*d-b*c)^7/g^4*B*b^2/(d*x+c)*a*c+3/2*d^5/i^3/(a*d-b*c)^7/g^4*A/(d*x+c) \\
& )^2*a^2*b*c+4*d^3/i^3/(a*d-b*c)^7/g^4*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3 \\
& /d(x+c)*c^2-5/2*e^2*d/i^3/(a*d-b*c)^7/g^4*A*b^5/(b*e/d+e/(d*x+c)*a-e/d/(d* \\
& x+c)*b*c)^2*c+10*e*d^2/i^3/(a*d-b*c)^7/g^4*B*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d* \\
& x+c)*b*c)*c-8*d^4/i^3/(a*d-b*c)^7/g^4*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2 \\
& /d(x+c)*a*c-5/2*e^2*d/i^3/(a*d-b*c)^7/g^4*B*b^5/(b*e/d+e/(d*x+c)*a-e/d/(d* \\
& x+c)*b*c)^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+3/2*d^5/i^3/(a*d-b*c)^7/g^4*B \\
& *\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^2*b*c-3/2*d^4/i^3/(a*d-b*c)^7/ \\
& g^4*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a*b^2*c^2
\end{aligned}$$

**Maxima [B]** time = 3.54157, size = 5152, normalized size = 9.15

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)^4/(d\*i\*x+c\*i)^3,x, algorithm="maxima")

[Out] 
$$\begin{aligned}
& -1/6*B*((60*b^4*d^4*x^4 + 2*b^4*c^4 - 13*a*b^3*c^3*d + 47*a^2*b^2*c^2*d^2 + \\
& 27*a^3*b*c*d^3 - 3*a^4*d^4 + 30*(3*b^4*c*d^3 + 5*a*b^3*d^4)*x^3 + 10*(2*b^ \\
& 4*c^2*d^2 + 23*a*b^3*c*d^3 + 11*a^2*b^2*d^4)*x^2 - 5*(b^4*c^3*d - 11*a*b^3* \\
& c^2*d^2 - 35*a^2*b^2*c*d^3 - 3*a^3*b*d^4)*x)/((b^8*c^5*d^2 - 5*a*b^7*c^4*d^ \\
& 3 + 10*a^2*b^6*c^3*d^4 - 10*a^3*b^5*c^2*d^5 + 5*a^4*b^4*c*d^6 - a^5*b^3*d^7
\end{aligned}$$

$$\begin{aligned}
& )g^4i^3x^5 + (2b^8c^6d - 7ab^7c^5d^2 + 5a^2b^6c^4d^3 + 10a^3 \\
& *b^5c^3d^4 - 20a^4b^4c^2d^5 + 13a^5b^3c^2d^6 - 3a^6b^2d^7)g^4i \\
& ^3x^4 + (b^8c^7 + ab^7c^6d - 17a^2b^6c^5d^2 + 35a^3b^5c^4d^3 - \\
& 25a^4b^4c^3d^4 - a^5b^3c^2d^5 + 9a^6b^2c^2d^6 - 3a^7b^2d^7)g^4* \\
& i^3x^3 + (3ab^7c^7 - 9a^2b^6c^6d + a^3b^5c^5d^2 + 25a^4b^4c^4 \\
& *d^3 - 35a^5b^3c^3d^4 + 17a^6b^2c^2d^5 - a^7b^2c^2d^6 - a^8d^7)g^4 \\
& *i^3x^2 + (3a^2b^6c^7 - 13a^3b^5c^6d + 20a^4b^4c^5d^2 - 10a^5b \\
& ^3c^4d^3 - 5a^6b^2c^3d^4 + 7a^7b^2c^2d^5 - 2a^8c^2d^6)g^4i^3*x \\
& + (a^3b^5c^7 - 5a^4b^4c^6d + 10a^5b^3c^5d^2 - 10a^6b^2c^4d^3 \\
& + 5a^7b^2c^3d^4 - a^8c^2d^5)g^4i^3) + 60b^2d^3\log(b*x + a)/((b^6c \\
& ^6 - 6ab^5c^5d + 15a^2b^4c^4d^2 - 20a^3b^3c^3d^3 + 15a^4b^2c \\
& ^2d^4 - 6a^5b^2c^2d^5 + a^6d^6)g^4i^3) - 60b^2d^3\log(d*x + c)/((b^6c \\
& ^6 - 6ab^5c^5d + 15a^2b^4c^4d^2 - 20a^3b^3c^3d^3 + 15a^4b^2c \\
& ^2d^4 - 6a^5b^2c^2d^5 + a^6d^6)g^4i^3))*\log(b*e*x/(d*x + c) + a*e/(d*x \\
& + c)) - 1/6A*((60b^4d^4*x^4 + 2b^4c^4 - 13ab^3c^3d + 47a^2b^2c \\
& ^2d^2 + 27a^3b^2c^2d^3 - 3a^4d^4 + 30*(3b^4c^3d^3 + 5ab^3d^4)*x^3 + \\
& 10*(2b^4c^2d^2 + 23ab^3c^2d^3 + 11a^2b^2d^4)*x^2 - 5*(b^4c^3d - 1 \\
& 1ab^3c^2d^2 - 35a^2b^2c^2d^3 - 3a^3b^2d^4)*x)/((b^8c^5d^2 - 5ab^7 \\
& c^4d^3 + 10a^2b^6c^3d^4 - 10a^3b^5c^2d^5 + 5a^4b^4c^2d^6 - a^5 \\
& *b^3d^7)g^4i^3x^5 + (2b^8c^6d - 7ab^7c^5d^2 + 5a^2b^6c^4d^3 \\
& + 10a^3b^5c^3d^4 - 20a^4b^4c^2d^5 + 13a^5b^3c^2d^6 - 3a^6b^2d^7) \\
& )g^4i^3x^4 + (b^8c^7 + ab^7c^6d - 17a^2b^6c^5d^2 + 35a^3b^5c^4 \\
& ^4d^3 - 25a^4b^4c^3d^4 - a^5b^3c^2d^5 + 9a^6b^2c^2d^6 - 3a^7b^2d^7) \\
& )g^4i^3x^3 + (3ab^7c^7 - 9a^2b^6c^6d + a^3b^5c^5d^2 + 25a^4 \\
& *b^4c^4d^3 - 35a^5b^3c^3d^4 + 17a^6b^2c^2d^5 - a^7b^2c^2d^6 - a^8* \\
& d^7)g^4i^3x^2 + (3a^2b^6c^7 - 13a^3b^5c^6d + 20a^4b^4c^5d^2 - \\
& 10a^5b^3c^4d^3 - 5a^6b^2c^3d^4 + 7a^7b^2c^2d^5 - 2a^8c^2d^6)g^ \\
& ^4i^3*x + (a^3b^5c^7 - 5a^4b^4c^6d + 10a^5b^3c^5d^2 - 10a^6b^2c^ \\
& ^4d^3 + 5a^7b^2c^3d^4 - a^8c^2d^5)g^4i^3) + 60b^2d^3\log(b*x + a) \\
& /((b^6c^6 - 6ab^5c^5d + 15a^2b^4c^4d^2 - 20a^3b^3c^3d^3 + 15a \\
& ^4b^2c^2d^4 - 6a^5b^2c^2d^5 + a^6d^6)g^4i^3) - 60b^2d^3\log(d*x + c) \\
& )/((b^6c^6 - 6ab^5c^5d + 15a^2b^4c^4d^2 - 20a^3b^3c^3d^3 + 15* \\
& a^4b^2c^2d^4 - 6a^5b^2c^2d^5 + a^6d^6)g^4i^3)) - 1/36*(4b^5c^5 - 45 \\
& *ab^4c^4d + 360a^2b^3c^3d^2 - 490a^3b^2c^2d^3 + 180a^4b^2c^2d^4 \\
& - 9a^5d^5 + 120*(b^5c^4d^4 - ab^4d^5)*x^4 + 120*(3b^5c^2d^3 - 2ab^ \\
& 4c^2d^4 - a^2b^3d^5)*x^3 + 20*(11b^5c^3d^2 + 21ab^4c^2d^3 - 39a^2 \\
& *b^3c^2d^4 + 7a^3b^2d^5)*x^2 - 180*(b^5d^5*x^5 + a^3b^2c^2d^3 + (2b \\
& ^5c^4d^4 + 3ab^4d^5)*x^4 + (b^5c^2d^3 + 6ab^4c^2d^4 + 3a^2b^3d^5) \\
& )*x^3 + (3ab^4c^2d^3 + 6a^2b^3c^2d^4 + a^3b^2d^5)*x^2 + (3a^2b^3c \\
& ^2d^3 + 2a^3b^2c^2d^4)*x*\log(b*x + a)^2 - 180*(b^5d^5*x^5 + a^3b^2c^ \\
& ^2d^3 + (2b^5c^4d^4 + 3ab^4d^5)*x^4 + (b^5c^2d^3 + 6ab^4c^2d^4 + 3* \\
& a^2b^3d^5)*x^3 + (3ab^4c^2d^3 + 6a^2b^3c^2d^4 + a^3b^2d^5)*x^2 + \\
& (3a^2b^3c^2d^3 + 2a^3b^2c^2d^4)*x*\log(d*x + c)^2 - 5*(5b^5c^4d - \\
& 108ab^4c^3d^2 + 78a^2b^3c^2d^3 + 52a^3b^2c^2d^4 - 27a^4b^2d^5)*x \\
& + 120*(b^5d^5*x^5 + a^3b^2c^2d^3 + (2b^5c^4d^4 + 3ab^4d^5)*x^4 + (
\end{aligned}$$

$$\begin{aligned}
& b^5 c^2 d^3 + 6 a b^4 c d^4 + 3 a^2 b^3 d^5) x^3 + (3 a b^4 c^2 d^3 + 6 a^2 \\
& * b^3 c d^4 + a^3 b^2 d^5) x^2 + (3 a^2 b^3 c^2 d^3 + 2 a^3 b^2 c d^4) x) * \log(b x + a) - 120 * (b^5 d^5 x^5 + a^3 b^2 c^2 d^3 + (2 b^5 c d^4 + 3 a b^4 d^5) x^4 + (b^5 c^2 d^3 + 6 a b^4 c d^4 + 3 a^2 b^3 d^5) x^3 + (3 a b^4 c^2 d^3 + 6 a^2 b^3 c d^4 + a^3 b^2 d^5) x^2 + (3 a^2 b^3 c^2 d^3 + 2 a^3 b^2 c d^4) x - 3 * (b^5 d^5 x^5 + a^3 b^2 c^2 d^3 + (2 b^5 c d^4 + 3 a b^4 d^5) x^4 + (b^5 c^2 d^3 + 6 a b^4 c d^4 + 3 a^2 b^3 d^5) x^3 + (3 a b^4 c^2 d^3 + 6 a^2 b^3 c d^4 + a^3 b^2 d^5) x^2 + (3 a^2 b^3 c^2 d^3 + 2 a^3 b^2 c d^4) x) * \log(b x + a)) * \log(d x + c)) * B / (a^3 b^6 c^8 g^4 i^3 - 6 a^4 b^5 c^7 d g^4 i^3 + 15 a^5 b^4 c^6 d^2 g^4 i^3 - 20 a^6 b^3 c^5 d^3 g^4 i^3 + 15 a^7 b^2 c^4 d^4 g^4 i^3 - 6 a^8 b c^3 d^5 g^4 i^3 + a^9 c^2 d^6 g^4 i^3 + (b^9 c^6 d^2 g^4 i^3 - 6 a b^8 c^5 d^3 g^4 i^3 + 15 a^2 b^7 c^4 d^4 g^4 i^3 - 20 a^3 b^6 c^3 d^5 g^4 i^3 + 15 a^4 b^5 c^2 d^6 g^4 i^3 - 6 a^5 b^4 c d^7 g^4 i^3 + a^6 b^3 d^8 g^4 i^3) x^5 + (2 b^9 c^7 d g^4 i^3 - 9 a b^8 c^6 d^2 g^4 i^3 + 12 a^2 b^7 c^5 d^3 g^4 i^3 + 5 a^3 b^6 c^4 d^4 g^4 i^3 - 30 a^4 b^5 c^3 d^5 g^4 i^3 + 33 a^5 b^4 c^2 d^6 g^4 i^3 - 16 a^6 b^3 c d^7 g^4 i^3 + 3 a^7 b^2 d^8 g^4 i^3) x^4 + (b^9 c^8 g^4 i^3 - 18 a^2 b^7 c^6 d^2 g^4 i^3 + 52 a^3 b^6 c^5 d^3 g^4 i^3 - 60 a^4 b^5 c^4 d^4 g^4 i^3 + 24 a^5 b^4 c^3 d^5 g^4 i^3 + 10 a^6 b^3 c^2 d^6 g^4 i^3 - 12 a^7 b^2 c d^7 g^4 i^3 + 3 a^8 b d^8 g^4 i^3) x^3 + (3 a b^8 c^8 g^4 i^3 - 12 a^2 b^7 c^7 d g^4 i^3 + 10 a^3 b^6 c^6 d^2 g^4 i^3 + 24 a^4 b^5 c^5 d^3 g^4 i^3 - 60 a^5 b^4 c^4 d^4 g^4 i^3 + 52 a^6 b^3 c^3 d^5 g^4 i^3 - 18 a^7 b^2 c^2 d^6 g^4 i^3 + a^9 d^8 g^4 i^3) x^2 + (3 a^2 b^7 c^8 g^4 i^3 - 16 a^3 b^6 c^7 d g^4 i^3 + 33 a^4 b^5 c^6 d^2 g^4 i^3 - 30 a^5 b^4 c^5 d^3 g^4 i^3 + 5 a^6 b^3 c^4 d^4 g^4 i^3 + 12 a^7 b^2 c^3 d^5 g^4 i^3 - 9 a^8 b c^2 d^6 g^4 i^3 + 2 a^9 c d^7 g^4 i^3) x)
\end{aligned}$$


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**Fricas [B]** time = 0.661795, size = 3140, normalized size = 5.58

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)^4/(d\*i\*x+c\*i)^3,x, algorithm="fricas")

[Out]  $-1/36 * (4 * (3A + B) * b^5 c^5 - 45 * (2A + B) * a b^4 c^4 d + 360 * (A + B) * a^2 b^3 c^3 d^2 - 10 * (12A + 49B) * a^3 b^2 c^2 d^3 - 180 * (A - B) * a^4 b c d^4 + 9 * (2A - B) * a^5 d^5 + 120 * ((3A + B) * b^5 c d^4 - (3A + B) * a b^4 d^5) * x^4 + 60 * (3 * (3A + 2B) * b^5 c^2 d^3 + 2 * (3A - 2B) * a b^4 c d^4 - (15A + 2B) * a^2 b^3 d^5) * x^3 + 20 * ((6A + 11B) * b^5 c^3 d^2 + 21 * (3A + B) * a b^4 c^2 d^3 - 3 * (12A + 13B) * a^2 b^3 c d^4 - (33A - 7B) * a^3 b^2 d^5) * x^2 + 180 * (B b^5$

$$\begin{aligned}
& d^5 x^5 + B a^3 b^2 c^2 d^3 + (2 B b^5 c d^4 + 3 B a b^4 d^5) x^4 + (B b^5 c^2 d^3 + 6 B a b^4 c d^4 + 3 B a^2 b^3 d^5) x^3 + (3 B a b^4 c^2 d^3 + 6 B a^2 b^3 c d^4 + B a^3 b^2 d^5) x^2 + (3 B a^2 b^3 c^2 d^3 + 2 B a^3 b^2 c d^4) x \\
& * \log\left(\frac{b e^x + a e}{d x + c}\right)^2 - 5 \left( (6 A + 5 B) b^5 c^4 d - 36 (2 A + 3 B) a b^4 c^3 d^2 - 6 (24 A - 13 B) a^2 b^3 c^2 d^3 + 4 (48 A + 13 B) a^3 b^2 c d^4 + 9 (2 A - 3 B) a^4 b d^5 \right) x + 6 (20 (3 A + B) b^5 d^5 x^5 + 2 B b^5 c^5 - 15 B a b^4 c^4 d + 60 B a^2 b^3 c^3 d^2 + 60 A a^3 b^2 c^2 d^3 - 30 B a^4 b c d^4 + 3 B a^5 d^5 + 20 \left( (6 A + 5 B) b^5 c d^4 + 9 A a b^4 d^5 \right) x^4 \\
& + 10 \left( (6 A + 11 B) b^5 c^2 d^3 + 18 (2 A + B) a b^4 c d^4 + 9 (2 A - B) a^2 b^3 d^5 \right) x^3 + 10 (2 B b^5 c^3 d^2 + 9 (2 A + 3 B) a b^4 c^2 d^3 + 36 A a^2 b^3 c d^4 + 3 (2 A - 3 B) a^3 b^2 d^5) x^2 - 5 (B b^5 c^4 d - 12 B a b^4 c^3 d^2 - 36 (A + B) a^2 b^3 c^2 d^3 - 24 (A - B) a^3 b^2 c d^4 + 3 B a^4 b d^5) x \\
& * \log\left(\frac{b e^x + a e}{d x + c}\right) / \left( (b^9 c^6 d^2 - 6 a b^8 c^5 d^3 + 15 a^2 b^7 c^4 d^4 - 20 a^3 b^6 c^3 d^5 + 15 a^4 b^5 c^2 d^6 - 6 a^5 b^4 c d^7 + a^6 b^3 d^8) g^4 i^3 x^5 + (2 b^9 c^7 d - 9 a b^8 c^6 d^2 + 12 a^2 b^7 c^5 d^3 + 5 a^3 b^6 c^4 d^4 - 30 a^4 b^5 c^3 d^5 + 33 a^5 b^4 c^2 d^6 - 16 a^6 b^3 c d^7 + 3 a^7 b^2 d^8) g^4 i^3 x^4 + (b^9 c^8 - 18 a^2 b^7 c^6 d^2 + 52 a^3 b^6 c^5 d^3 - 60 a^4 b^5 c^4 d^4 + 24 a^5 b^4 c^3 d^5 + 10 a^6 b^3 c^2 d^6 - 12 a^7 b^2 c d^7 + 3 a^8 b d^8) g^4 i^3 x^3 + (3 a b^8 c^8 - 12 a^2 b^7 c^7 d + 10 a^3 b^6 c^6 d^2 + 24 a^4 b^5 c^5 d^3 - 60 a^5 b^4 c^4 d^4 + 52 a^6 b^3 c^3 d^5 - 18 a^7 b^2 c^2 d^6 + a^9 d^8) g^4 i^3 x^2 + (3 a^2 b^7 c^8 - 16 a^3 b^6 c^7 d + 33 a^4 b^5 c^6 d^2 - 30 a^5 b^4 c^5 d^3 + 5 a^6 b^3 c^4 d^4 + 12 a^7 b^2 c^3 d^5 - 9 a^8 b c^2 d^6 + 2 a^9 c d^7) g^4 i^3 x + (a^3 b^6 c^8 - 6 a^4 b^5 c^7 d + 15 a^5 b^4 c^6 d^2 - 20 a^6 b^3 c^5 d^3 + 15 a^7 b^2 c^4 d^4 - 6 a^8 b c^3 d^5 + a^9 c^2 d^6) g^4 i^3 \right)
\end{aligned}$$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*(b\*x+a)/(d\*x+c)))/(b\*g\*x+a\*g)\*\*4/(d\*i\*x+c\*i)\*\*3,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{B \log\left(\frac{bx+a}{dx+c}\right) + A}{(bgx + ag)^4 (dix + ci)^3} dx$$



Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)/((b*g*x + a*g)^4*(d*i*x + c*i)^3), x)
```

$$3.55 \quad \int (ag + bgx)^3 (ci + dix) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx$$

**Optimal.** Leaf size=539

$$\frac{B^2 g^3 i (bc - ad)^5 \text{PolyLog} \left( 2, \frac{d(a+bx)}{b(c+dx)} \right)}{10b^2 d^4} - \frac{B g^3 i (bc - ad)^5 \log \left( \frac{bc-ad}{b(c+dx)} \right) \left( 6B \log \left( \frac{e(a+bx)}{c+dx} \right) + 6A + 11B \right)}{60b^2 d^4} - \frac{B g^3 i (a + bx)(bc - ad)^3 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{20b^2 d^2}$$

[Out]  $(3*B^2*(b*c - a*d)^4*g^3*i*x)/(10*b*d^3) - (3*B^2*(b*c - a*d)^3*g^3*i*(c + d*x)^2)/(20*d^4) + (b*B^2*(b*c - a*d)^2*g^3*i*(c + d*x)^3)/(30*d^4) - (B*(b*c - a*d)^2*g^3*i*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(30*b^2*d) - (B*(b*c - a*d)*g^3*i*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(10*b^2) + ((b*c - a*d)*g^3*i*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))^2/(20*b^2) + (g^3*i*(a + b*x)^4*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))^2/(5*b) + (B*(b*c - a*d)^3*g^3*i*(a + b*x)^2*(3*A + B + 3*B*Log[(e*(a + b*x))/(c + d*x)]))/(60*b^2*d^2) - (B*(b*c - a*d)^4*g^3*i*(a + b*x)*(6*A + 5*B + 6*B*Log[(e*(a + b*x))/(c + d*x)]))/(60*b^2*d^3) - (B*(b*c - a*d)^5*g^3*i*Log[(b*c - a*d)/(b*(c + d*x))]*(6*A + 11*B + 6*B*Log[(e*(a + b*x))/(c + d*x)]))/(60*b^2*d^4) - (B^2*(b*c - a*d)^5*g^3*i*Log[c + d*x])/(10*b^2*d^4) - (B^2*(b*c - a*d)^5*g^3*i*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(10*b^2*d^4)$

**Rubi [A]** time = 1.77985, antiderivative size = 622, normalized size of antiderivative = 1.15, number of steps used = 54, number of rules used = 13, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.325$ , Rules used = {2528, 2525, 12, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{B^2 g^3 i (bc - ad)^5 \text{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right)}{10b^2 d^4} + \frac{B g^3 i (bc - ad)^5 \log(c + dx) \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{10b^2 d^4} + \frac{B g^3 i (a + bx)^2 (bc - ad)^3 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{20b^2 d^2}$$

Antiderivative was successfully verified.

[In] Int[(a\*g + b\*g\*x)^3\*(c\*i + d\*i\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2,x]

[Out]  $-(A*B*(b*c - a*d)^4*g^3*i*x)/(10*b*d^3) + (B^2*(b*c - a*d)^4*g^3*i*x)/(60*b*d^3) - (B^2*(b*c - a*d)^3*g^3*i*(a + b*x)^2)/(30*b^2*d^2) + (B^2*(b*c - a*d)^2*g^3*i*(a + b*x)^3)/(30*b^2*d) - (B^2*(b*c - a*d)^4*g^3*i*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)]/(10*b^2*d^3) + (B*(b*c - a*d)^3*g^3*i*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(20*b^2*d^2) - (B*(b*c - a*d)^2*g^3*i*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(30*b^2*d) - (B*(b*c - a*d)*g^3*i*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(10*b^2) + (($

$$b*c - a*d)*g^{3*i*(a + b*x)^4*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])^2)/(4*b^2) + (d*g^{3*i*(a + b*x)^5*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])^2)/(5*b^2) + (B^2*(b*c - a*d)^5*g^{3*i*\text{Log}[c + d*x]}/(12*b^2*d^4) - (B^2*(b*c - a*d)^5*g^{3*i*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x]}/(10*b^2*d^4) + (B*(b*c - a*d)^5*g^{3*i*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])*\text{Log}[c + d*x]}/(10*b^2*d^4) + (B^2*(b*c - a*d)^5*g^{3*i*\text{Log}[c + d*x]^2}/(20*b^2*d^4) - (B^2*(b*c - a*d)^5*g^{3*i*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]}/(10*b^2*d^4)$$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.), x_Symbol] := Simp[(((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[(((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_.))^(p_.))*((c_.) + (d_.)*(x_.))^(q_.))^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

### Rule 31

```
Int[((a_) + (b_.)*(x_.))^-1, x_Symbol] := Simp[Log[RemoveContent[a + b*x, x]]/b, x] /; FreeQ[{a, b}, x]
```

### Rule 43

```
Int[((a_.) + (b_.)*(x_)^(m_.))*((c_.) + (d_.)*(x_)^(n_.)), x_Symbol] := Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

#### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

#### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

#### Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

#### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

#### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

#### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]*(b_.))^(p_.)*((f_) + (g_.
)*(x_)^(q_.)), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

$\text{Int}[\frac{(a + \text{Log}[c \cdot x^n] \cdot b)}{x}, x_{\text{Symbol}}] \rightarrow \text{Simp}[\frac{a + b \cdot \text{Log}[c \cdot x^n]}{2 \cdot b \cdot n}, x] /; \text{FreeQ}\{a, b, c, n, x\}$

Rubi steps

$$\begin{aligned}
\int (55c + 55dx)(ag + bgx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx &= \int \left( \frac{55(bc - ad)(ag + bgx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b} + \frac{55d(ag + bgx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b} \right) dx \\
&= \frac{(55(bc - ad)) \int (ag + bgx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{b} + \frac{55d \int (ag + bgx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{b} \quad (55d) \\
&= \frac{55(bc - ad)g^3(a + bx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{4b^2} + \frac{11dg^3(a + bx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{4b^2} \\
&= \frac{55(bc - ad)g^3(a + bx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{4b^2} + \frac{11dg^3(a + bx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{4b^2} \\
&= \frac{55(bc - ad)g^3(a + bx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{4b^2} + \frac{11dg^3(a + bx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{4b^2} \\
&= \frac{55(bc - ad)g^3(a + bx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{4b^2} + \frac{11dg^3(a + bx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{4b^2} \\
&= -\frac{11AB(bc - ad)^4 g^3 x}{2bd^3} + \frac{11B(bc - ad)^3 g^3 (a + bx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{4b^2 d^2} \\
&= -\frac{11AB(bc - ad)^4 g^3 x}{2bd^3} - \frac{11B^2(bc - ad)^4 g^3 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{2b^2 d^3} \\
&= -\frac{11AB(bc - ad)^4 g^3 x}{2bd^3} - \frac{11B^2(bc - ad)^4 g^3 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{2b^2 d^3} \\
&= -\frac{11AB(bc - ad)^4 g^3 x}{2bd^3} + \frac{11B^2(bc - ad)^4 g^3 x}{12bd^3} - \frac{11B^2(bc - ad)^3 g^3}{6b^2 d^2} \\
&= -\frac{11AB(bc - ad)^4 g^3 x}{2bd^3} + \frac{11B^2(bc - ad)^4 g^3 x}{12bd^3} - \frac{11B^2(bc - ad)^3 g^3}{6b^2 d^2} \\
&= -\frac{11AB(bc - ad)^4 g^3 x}{2bd^3} + \frac{11B^2(bc - ad)^4 g^3 x}{12bd^3} - \frac{11B^2(bc - ad)^3 g^3}{6b^2 d^2} \\
&= -\frac{11AB(bc - ad)^4 g^3 x}{2bd^3} + \frac{11B^2(bc - ad)^4 g^3 x}{12bd^3} - \frac{11B^2(bc - ad)^3 g^3}{6b^2 d^2}
\end{aligned}$$

**Mathematica [A]** time = 0.760173, size = 905, normalized size = 1.68

$$g^3 i \left( 4d \left( A + B \log \left( \frac{e^{(a+bx)}}{c+dx} \right) \right)^2 (a+bx)^5 + 5(bc-ad) \left( A + B \log \left( \frac{e^{(a+bx)}}{c+dx} \right) \right)^2 (a+bx)^4 - \frac{5B(bc-ad)^2 (-6B \log(c+dx)(bc-ad)^3 - 6(A+bx)^2)}{(c+dx)^2} \right)$$

Antiderivative was successfully verified.

[In] Integrate[(a\*g + b\*g\*x)^3\*(c\*i + d\*i\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])^2,x]

[Out] (g^3\*i\*(5\*(b\*c - a\*d)\*(a + b\*x)^4\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))^2 + 4\*d\*(a + b\*x)^5\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))^2 - (5\*B\*(b\*c - a\*d)^2\*(6\*A\*b\*d\*(b\*c - a\*d)^2\*x + 6\*B\*d\*(b\*c - a\*d)^2\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x]) + 3\*d^2\*(-(b\*c) + a\*d)\*(a + b\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])) + 2\*d^3\*(a + b\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])) - 6\*B\*(b\*c - a\*d)^3\*Log[c + d\*x] - 6\*(b\*c - a\*d)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))\*Log[c + d\*x] + B\*(b\*c - a\*d)\*(2\*b\*d\*(b\*c - a\*d)\*x - d^2\*(a + b\*x)^2 - 2\*(b\*c - a\*d)^2\*Log[c + d\*x]) + 3\*B\*(b\*c - a\*d)^2\*(b\*d\*x + (-(b\*c) + a\*d)\*Log[c + d\*x]) + 3\*B\*(b\*c - a\*d)^3\*((2\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)] - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])))/(3\*d^4) + (B\*(b\*c - a\*d)\*(24\*A\*b\*d\*(b\*c - a\*d)^3\*x + 24\*B\*d\*(b\*c - a\*d)^3\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x]) - 12\*d^2\*(b\*c - a\*d)^2\*(a + b\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])) + 8\*d^3\*(b\*c - a\*d)\*(a + b\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])) - 6\*d^4\*(a + b\*x)^4\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])) - 24\*B\*(b\*c - a\*d)^4\*Log[c + d\*x] - 24\*(b\*c - a\*d)^4\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))\*Log[c + d\*x] + 4\*B\*(b\*c - a\*d)^2\*(2\*b\*d\*(b\*c - a\*d)\*x - d^2\*(a + b\*x)^2 - 2\*(b\*c - a\*d)^2\*Log[c + d\*x]) + B\*(b\*c - a\*d)\*(6\*b\*d\*(b\*c - a\*d)^2\*x + 3\*d^2\*(-(b\*c) + a\*d)\*(a + b\*x)^2 + 2\*d^3\*(a + b\*x)^3 - 6\*(b\*c - a\*d)^3\*Log[c + d\*x]) + 12\*B\*(b\*c - a\*d)^3\*(b\*d\*x + (-(b\*c) + a\*d)\*Log[c + d\*x]) + 12\*B\*(b\*c - a\*d)^4\*((2\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)] - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])))/(3\*d^4))/(20\*b^2)

**Maple [F]** time = 2.674, size = 0, normalized size = 0.

$$\int (bgx + ag)^3 (dix + ci) \left( A + B \ln \left( \frac{e^{(bx+a)}}{dx+c} \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^3\*(d\*i\*x+c\*i)\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2,x)

[Out]  $\int ((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*\ln(e*(b*x+a)/(d*x+c)))^2,x)$

**Maxima [B]** time = 1.92535, size = 4301, normalized size = 7.98

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima")`

[Out] 
$$\begin{aligned} & 1/5*A^2*b^3*d*g^3*i*x^5 + 1/4*A^2*b^3*c*g^3*i*x^4 + 3/4*A^2*a*b^2*d*g^3*i*x^4 \\ & + A^2*a*b^2*c*g^3*i*x^3 + A^2*a^2*b*d*g^3*i*x^3 + 3/2*A^2*a^2*b*c*g^3*i*x^2 \\ & + 1/2*A^2*a^3*d*g^3*i*x^2 + 2*(x*\log(b*e*x/(d*x+c)) + a*e/(d*x+c)) + a*\log(b*x+a)/b \\ & - c*\log(d*x+c)/d)*A*B*a^3*c*g^3*i + 3*(x^2*\log(b*e*x/(d*x+c)) + a*e/(d*x+c)) \\ & - a^2*\log(b*x+a)/b^2 + c^2*\log(d*x+c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*a^2*b*c*g^3*i \\ & + (2*x^3*\log(b*e*x/(d*x+c)) + a*e/(d*x+c)) + 2*a^3*\log(b*x+a)/b^3 - 2*c^3*\log(d*x+c)/d^3 \\ & - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a*b^2*c*g^3*i \\ & + 1/12*(6*x^4*\log(b*e*x/(d*x+c)) + a*e/(d*x+c)) - 6*a^4*\log(b*x+a)/b^4 + 6*c^4*\log(d*x+c)/d^4 \\ & - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*a*b^3*c*g^3*i \\ & + (x^2*\log(b*e*x/(d*x+c)) + a*e/(d*x+c)) - a^2*\log(b*x+a)/b^2 + c^2*\log(d*x+c)/d^2 \\ & - (b*c - a*d)*x/(b*d))*A*B*a^3*d*g^3*i + (2*x^3*\log(b*e*x/(d*x+c)) + a*e/(d*x+c)) \\ & + 2*a^3*\log(b*x+a)/b^3 - 2*c^3*\log(d*x+c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a^2*b*d*g^3*i \\ & + 1/4*(6*x^4*\log(b*e*x/(d*x+c)) + a*e/(d*x+c)) - 6*a^4*\log(b*x+a)/b^4 + 6*c^4*\log(d*x+c)/d^4 \\ & - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*a*b^2*d*g^3*i \\ & + 1/30*(12*x^5*\log(b*e*x/(d*x+c)) + a*e/(d*x+c)) + 12*a^5*\log(b*x+a)/b^5 - 12*c^5*\log(d*x+c)/d^5 \\ & - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 \\ & - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*A*B*b^3*d*g^3*i + A^2*a^3*c*g^3*i*x - 1/60*(6*a^4*c*d^4*g^3*i - (6*g^3*i*\log(e) \\ & + 5*g^3*i)*b^4*c^5 + (30*g^3*i*\log(e) + 19*g^3*i)*a*b^3*c^4*d - (60*g^3*i*\log(e) + 23*g^3*i)*a^2*b^2*c^3*d^2 \\ & + 3*(20*g^3*i*\log(e) + g^3*i)*a^3*b*c^2*d^3)*B^2*\log(d*x+c)/(b*d^4) + 1/10*(b^5*c^5*g^3*i - 5*a*b^4*c^4*d*g^3*i \\ & + 10*a^2*b^3*c^3*d^2*g^3*i - 10*a^3*b^2*c^2*d^3*g^3*i + 5*a^4*b*c*d^4*g^3*i - a^5*d^5*g^3*i)*(log(b*x+a)*log((b*d*x+a*d)/(b*c-a*d) + 1) \\ & + \operatorname{dilog}(-(b*d*x+a*d)/(b*c-a*d)))*B^2/(b^2*d^4) + 1/60*(12*B^2*b^5*d^5*g^3*i*x^5*\log(e)^2 + 3*((5*g^3*i*\log(e))^2 - 2*g^3*i*\log(e))*b^5*c*d^4 \\ & + (15*g^3*i*\log(e))^2 + 2*g^3*i*\log(e))*a*b^4*d^5)*B^2*x^4 - 2*((g^3*i*\log(e) - g^3*i)*b^5*c^2*d^3 - 2*(15*g^3*i*\log(e))^2 - 5*g^3*i*\log(e) - g^3*i)*a*b^4 \end{aligned}$$



$$\begin{aligned}
& *c*d^4 - (30*g^3*i*log(e)^2 + 11*g^3*i*log(e) + g^3*i)*a^2*b^3*d^5)*B^2*x^3 \\
& + ((3*g^3*i*log(e) - 2*g^3*i)*b^5*c^3*d^2 - 3*(5*g^3*i*log(e) - 4*g^3*i)*a \\
& *b^4*c^2*d^3 + 3*(30*g^3*i*log(e)^2 - 5*g^3*i*log(e) - 6*g^3*i)*a^2*b^3*c*d \\
& ^4 + (30*g^3*i*log(e)^2 + 27*g^3*i*log(e) + 8*g^3*i)*a^3*b^2*d^5)*B^2*x^2 - \\
& ((6*g^3*i*log(e) - g^3*i)*b^5*c^4*d - 2*(15*g^3*i*log(e) - 4*g^3*i)*a*b^4* \\
& c^3*d^2 + 12*(5*g^3*i*log(e) - 2*g^3*i)*a^2*b^3*c^2*d^3 - 2*(30*g^3*i*log(e) \\
& )^2 + 15*g^3*i*log(e) - 14*g^3*i)*a^3*b^2*c*d^4 - (6*g^3*i*log(e) + 11*g^3*i \\
& )*a^4*b*d^5)*B^2*x + 3*(4*B^2*b^5*d^5*g^3*i*x^5 + 20*B^2*a^3*b^2*c*d^4*g^3 \\
& *i*x + 5*(b^5*c*d^4*g^3*i + 3*a*b^4*d^5*g^3*i)*B^2*x^4 + 20*(a*b^4*c*d^4*g^ \\
& 3*i + a^2*b^3*d^5*g^3*i)*B^2*x^3 + 10*(3*a^2*b^3*c*d^4*g^3*i + a^3*b^2*d^5* \\
& g^3*i)*B^2*x^2 + (5*a^4*b*c*d^4*g^3*i - a^5*d^5*g^3*i)*B^2)*log(b*x + a)^2 \\
& + 3*(4*B^2*b^5*d^5*g^3*i*x^5 + 20*B^2*a^3*b^2*c*d^4*g^3*i*x + 5*(b^5*c*d^4* \\
& g^3*i + 3*a*b^4*d^5*g^3*i)*B^2*x^4 + 20*(a*b^4*c*d^4*g^3*i + a^2*b^3*d^5*g^ \\
& 3*i)*B^2*x^3 + 10*(3*a^2*b^3*c*d^4*g^3*i + a^3*b^2*d^5*g^3*i)*B^2*x^2 - (b^ \\
& 5*c^5*g^3*i - 5*a*b^4*c^4*d*g^3*i + 10*a^2*b^3*c^3*d^2*g^3*i - 10*a^3*b^2*c \\
& ^2*d^3*g^3*i)*B^2)*log(d*x + c)^2 + (24*B^2*b^5*d^5*g^3*i*x^5*log(e) + 6*(( \\
& 5*g^3*i*log(e) - g^3*i)*b^5*c*d^4 + (15*g^3*i*log(e) + g^3*i)*a*b^4*d^5)*B^ \\
& 2*x^4 - 2*(b^5*c^2*d^3*g^3*i - 10*(6*g^3*i*log(e) - g^3*i)*a*b^4*c*d^4 - (6 \\
& 0*g^3*i*log(e) + 11*g^3*i)*a^2*b^3*d^5)*B^2*x^3 + 3*(b^5*c^3*d^2*g^3*i - 5* \\
& a*b^4*c^2*d^3*g^3*i + 5*(12*g^3*i*log(e) - g^3*i)*a^2*b^3*c*d^4 + (20*g^3*i \\
& *log(e) + 9*g^3*i)*a^3*b^2*d^5)*B^2*x^2 - 6*(b^5*c^4*d*g^3*i - 5*a*b^4*c^3* \\
& d^2*g^3*i + 10*a^2*b^3*c^2*d^3*g^3*i - a^4*b*d^5*g^3*i - 5*(4*g^3*i*log(e) \\
& + g^3*i)*a^3*b^2*c*d^4)*B^2*x - (6*a*b^4*c^4*d*g^3*i - 27*a^2*b^3*c^3*d^2*g \\
& ^3*i + 47*a^3*b^2*c^2*d^3*g^3*i - (30*g^3*i*log(e) + 31*g^3*i)*a^4*b*c*d^4 \\
& + (6*g^3*i*log(e) + 5*g^3*i)*a^5*d^5)*B^2)*log(b*x + a) - (24*B^2*b^5*d^5*g \\
& ^3*i*x^5*log(e) + 6*((5*g^3*i*log(e) - g^3*i)*b^5*c*d^4 + (15*g^3*i*log(e) \\
& + g^3*i)*a*b^4*d^5)*B^2*x^4 - 2*(b^5*c^2*d^3*g^3*i - 10*(6*g^3*i*log(e) - g \\
& ^3*i)*a*b^4*c*d^4 - (60*g^3*i*log(e) + 11*g^3*i)*a^2*b^3*d^5)*B^2*x^3 + 3*( \\
& b^5*c^3*d^2*g^3*i - 5*a*b^4*c^2*d^3*g^3*i + 5*(12*g^3*i*log(e) - g^3*i)*a^2 \\
& *b^3*c*d^4 + (20*g^3*i*log(e) + 9*g^3*i)*a^3*b^2*d^5)*B^2*x^2 - 6*(b^5*c^4* \\
& d*g^3*i - 5*a*b^4*c^3*d^2*g^3*i + 10*a^2*b^3*c^2*d^3*g^3*i - a^4*b*d^5*g^3* \\
& i - 5*(4*g^3*i*log(e) + g^3*i)*a^3*b^2*c*d^4)*B^2*x + 6*(4*B^2*b^5*d^5*g^3* \\
& i*x^5 + 20*B^2*a^3*b^2*c*d^4*g^3*i*x + 5*(b^5*c*d^4*g^3*i + 3*a*b^4*d^5*g^3 \\
& *i)*B^2*x^4 + 20*(a*b^4*c*d^4*g^3*i + a^2*b^3*d^5*g^3*i)*B^2*x^3 + 10*(3*a^ \\
& 2*b^3*c*d^4*g^3*i + a^3*b^2*d^5*g^3*i)*B^2*x^2 + (5*a^4*b*c*d^4*g^3*i - a^5 \\
& *d^5*g^3*i)*B^2)*log(b*x + a))*log(d*x + c))/(b^2*d^4)
\end{aligned}$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

integral  $\left( A^2 b^3 d g^3 i x^4 + A^2 a^3 c g^3 i + (A^2 b^3 c + 3 A^2 a b^2 d) g^3 i x^3 + 3 (A^2 a b^2 c + A^2 a^2 b d) g^3 i x^2 + (3 A^2 a^2 b c + A^2 a^3 d) g^3 i x + \dots \right)$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorith
ithm="fricas")
```

```
[Out] integral(A^2*b^3*d*g^3*i*x^4 + A^2*a^3*c*g^3*i + (A^2*b^3*c + 3*A^2*a*b^2*d)
)*g^3*i*x^3 + 3*(A^2*a*b^2*c + A^2*a^2*b*d)*g^3*i*x^2 + (3*A^2*a^2*b*c + A^
2*a^3*d)*g^3*i*x + (B^2*b^3*d*g^3*i*x^4 + B^2*a^3*c*g^3*i + (B^2*b^3*c + 3*
B^2*a*b^2*d)*g^3*i*x^3 + 3*(B^2*a*b^2*c + B^2*a^2*b*d)*g^3*i*x^2 + (3*B^2*a
^2*b*c + B^2*a^3*d)*g^3*i*x)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*b^3*d*
g^3*i*x^4 + A*B*a^3*c*g^3*i + (A*B*b^3*c + 3*A*B*a*b^2*d)*g^3*i*x^3 + 3*(A*
B*a*b^2*c + A*B*a^2*b*d)*g^3*i*x^2 + (3*A*B*a^2*b*c + A*B*a^3*d)*g^3*i*x)*l
og((b*e*x + a*e)/(d*x + c)), x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int (bgx + ag)^3 (dix + ci) \left( B \log \left( \frac{(bx + a)e}{dx + c} \right) + A \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorith
ithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(d*i*x + c*i)*(B*log((b*x + a)*e/(d*x + c)) + A)^
2, x)
```

$$3.56 \quad \int (ag + bgx)^2 (ci + dix) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx$$

**Optimal.** Leaf size=450

$$\frac{B^2 g^2 i (bc - ad)^4 \text{PolyLog} \left( 2, \frac{d(a+bx)}{b(c+dx)} \right)}{6b^2 d^3} + \frac{B g^2 i (bc - ad)^4 \log \left( \frac{bc-ad}{b(c+dx)} \right) \left( 2B \log \left( \frac{e(a+bx)}{c+dx} \right) + 2A + 3B \right)}{12b^2 d^3} + \frac{B g^2 i (a + bx)(bc - ad)}{12b^2 d}$$

[Out]  $-(B^2*(b*c - a*d)^3*g^2*i*x)/(3*b*d^2) + (B^2*(b*c - a*d)^2*g^2*i*(c + d*x)^2)/(12*d^3) - (B*(b*c - a*d)^2*g^2*i*(a + b*x)^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(12*b^2*d) - (B*(b*c - a*d)*g^2*i*(a + b*x)^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(6*b^2) + ((b*c - a*d)*g^2*i*(a + b*x)^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]^2)/(12*b^2) + (g^2*i*(a + b*x)^3*(c + d*x)*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]^2)/(4*b) + (B*(b*c - a*d)^3*g^2*i*(a + b*x)*(2*A + B + 2*B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(12*b^2*d^2) + (B*(b*c - a*d)^4*g^2*i*\text{Log}[(b*c - a*d)/(b*(c + d*x))]*(2*A + 3*B + 2*B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(12*b^2*d^3) + (B^2*(b*c - a*d)^4*g^2*i*\text{Log}[c + d*x])/(6*b^2*d^3) + (B^2*(b*c - a*d)^4*g^2*i*\text{PolyLog}[2, (d*(a + b*x))/(b*(c + d*x))])/(6*b^2*d^3)$

**Rubi [A]** time = 1.49015, antiderivative size = 537, normalized size of antiderivative = 1.19, number of steps used = 46, number of rules used = 13, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.325$ , Rules used = {2528, 2525, 12, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{B^2 g^2 i (bc - ad)^4 \text{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right)}{6b^2 d^3} - \frac{B g^2 i (bc - ad)^4 \log(c + dx) \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{6b^2 d^3} - \frac{B g^2 i (a + bx)^2 (bc - ad)^2 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{12b^2 d}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[(a*g + b*g*x)^2*(c*i + d*i*x)*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])^2,x]$

[Out]  $(A*B*(b*c - a*d)^3*g^2*i*x)/(6*b*d^2) - (B^2*(b*c - a*d)^3*g^2*i*x)/(12*b*d^2) + (B^2*(b*c - a*d)^2*g^2*i*(a + b*x)^2)/(12*b^2*d) + (B^2*(b*c - a*d)^3*g^2*i*(a + b*x)*\text{Log}[(e*(a + b*x))/(c + d*x)]/(6*b^2*d^2) - (B*(b*c - a*d)^2*g^2*i*(a + b*x)^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(12*b^2*d) - (B*(b*c - a*d)*g^2*i*(a + b*x)^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(6*b^2) + ((b*c - a*d)*g^2*i*(a + b*x)^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]^2)/(3*b^2) + (d*g^2*i*(a + b*x)^4*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]^2)/(4*b^2) - (B^2*(b*c - a*d)^4*g^2*i*\text{Log}[c + d*x])/(12*b^2*d^3) + (B^2*(b*c - a*d)^4*g^2*i*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/(6*b^2*d^3) - (B*($

$$b^2c - a^2d)^4 g^2 i (A + B \log[(e(a + bx))/(c + dx)]) \log[c + dx] / (6b^2 d^3) - (B^2 (b^2c - a^2d)^4 g^2 i \log[c + dx]^2) / (12b^2 d^3) + (B^2 (b^2c - a^2d)^4 g^2 i \text{PolyLog}[2, (b(c + dx))/(b^2c - a^2d)]) / (6b^2 d^3)$$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x] }, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[ ((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n) / (e*(m + 1)), x] - Dist[(b*n*p) / (e*(m + 1)), Int[SimplifyIntegrand[ ((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x]) / Rfx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_) /; FreeQ[b, x]]
```

### Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.))^(r_.)]^(s_.), x_Symbol] := Simp[ ((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r)^s) / b, x] + Dist[(q*r*s*(b*c - a*d)) / b, Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s - 1) / (c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

### Rule 31

```
Int[((a_) + (b_.)*(x_))^(n_), x_Symbol] := Simp[Log[RemoveContent[a + b*x, x]] / b, x] /; FreeQ[{a, b}, x]
```

### Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && LeQ[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol]
:> Simp[(Log[d + e*x]*(a + b*Log[c*RFX^p])^n)/e, x] - Dist[(b*n*p)/e,
Int[(Log[d + e*x]*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFX_), x_Symbol]
:> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFX, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFX, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)),
x_Symbol]
:> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])/g, x] -
Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /;
FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)),
x_Symbol]
:> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /;
FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol]
:> -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_.)*(x_))^(q_.),
x_Symbol]
:> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /;
FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol]
:> Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\begin{aligned}
\int (56c + 56dx)(ag + bgx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx &= \int \left( \frac{56(bc - ad)(ag + bgx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b} + \frac{56d(ag + bgx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b} \right) dx \\
&= \frac{(56(bc - ad)) \int (ag + bgx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{b} + \frac{56d \int (ag + bgx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{b} \\
&= \frac{56(bc - ad)g^2(a + bx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{3b^2} + \frac{14dg^2(a + bx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{3b^2} \\
&= \frac{56(bc - ad)g^2(a + bx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{3b^2} + \frac{14dg^2(a + bx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{3b^2} \\
&= \frac{56(bc - ad)g^2(a + bx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{3b^2} + \frac{14dg^2(a + bx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{3b^2} \\
&= \frac{56(bc - ad)g^2(a + bx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{3b^2} + \frac{14dg^2(a + bx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{3b^2} \\
&= \frac{28AB(bc - ad)^3 g^2 x}{3bd^2} - \frac{14B(bc - ad)^2 g^2 (a + bx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{3b^2 d} \\
&= \frac{28AB(bc - ad)^3 g^2 x}{3bd^2} + \frac{28B^2(bc - ad)^3 g^2 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{3b^2 d^2} \\
&= \frac{28AB(bc - ad)^3 g^2 x}{3bd^2} + \frac{28B^2(bc - ad)^3 g^2 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{3b^2 d^2} \\
&= \frac{28AB(bc - ad)^3 g^2 x}{3bd^2} - \frac{14B^2(bc - ad)^3 g^2 x}{3bd^2} + \frac{14B^2(bc - ad)^2 g^2 (a + bx)}{3b^2 d} \\
&= \frac{28AB(bc - ad)^3 g^2 x}{3bd^2} - \frac{14B^2(bc - ad)^3 g^2 x}{3bd^2} + \frac{14B^2(bc - ad)^2 g^2 (a + bx)}{3b^2 d} \\
&= \frac{28AB(bc - ad)^3 g^2 x}{3bd^2} - \frac{14B^2(bc - ad)^3 g^2 x}{3bd^2} + \frac{14B^2(bc - ad)^2 g^2 (a + bx)}{3b^2 d} \\
&= \frac{28AB(bc - ad)^3 g^2 x}{3bd^2} - \frac{14B^2(bc - ad)^3 g^2 x}{3bd^2} + \frac{14B^2(bc - ad)^2 g^2 (a + bx)}{3b^2 d}
\end{aligned}$$

**Mathematica [A]** time = 0.547115, size = 680, normalized size = 1.51

$$g^2 i \left( \frac{4B(bc-ad)^2 \left( B(bc-ad)^2 \left( 2 \operatorname{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right) + \log(c+dx) \left( 2 \log \left( \frac{d(a+bx)}{ad-bc} \right) - \log(c+dx) \right) \right) - d^2(a+bx)^2 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right) - 2(bc-ad)^2 \log(c+dx) \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{d^3} \right)$$

Antiderivative was successfully verified.

[In] Integrate[(a\*g + b\*g\*x)^2\*(c\*i + d\*i\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2,x]

[Out] (g^2\*i\*(4\*(b\*c - a\*d)\*(a + b\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))^2 + 3\*d\*(a + b\*x)^4\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))^2 + (4\*B\*(b\*c - a\*d)^2\*(2\*A\*b\*d\*(b\*c - a\*d)\*x + 2\*B\*d\*(b\*c - a\*d)\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x)] - d^2\*(a + b\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])) - 2\*B\*(b\*c - a\*d)^2\*Log[c + d\*x] - 2\*(b\*c - a\*d)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))\*Log[c + d\*x] + B\*(b\*c - a\*d)\*(b\*d\*x + (-b\*c) + a\*d)\*Log[c + d\*x] + B\*(b\*c - a\*d)^2\*((2\*Log[(d\*(a + b\*x))/(-b\*c) + a\*d]) - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])))/d^3 - (B\*(b\*c - a\*d)\*(6\*A\*b\*d\*(b\*c - a\*d)^2\*x + 6\*B\*d\*(b\*c - a\*d)^2\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x)] + 3\*d^2\*(-b\*c) + a\*d)\*(a + b\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) + 2\*d^3\*(a + b\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])) - 6\*B\*(b\*c - a\*d)^3\*Log[c + d\*x] - 6\*(b\*c - a\*d)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))\*Log[c + d\*x] + B\*(b\*c - a\*d)\*(2\*b\*d\*(b\*c - a\*d)\*x - d^2\*(a + b\*x)^2 - 2\*(b\*c - a\*d)^2\*Log[c + d\*x]) + 3\*B\*(b\*c - a\*d)^2\*(b\*d\*x + (-b\*c) + a\*d)\*Log[c + d\*x] + 3\*B\*(b\*c - a\*d)^3\*((2\*Log[(d\*(a + b\*x))/(-b\*c) + a\*d]) - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])))/d^3)/(12\*b^2)

**Maple [F]** time = 2.228, size = 0, normalized size = 0.

$$\int (bgx + ag)^2 (dix + ci) \left( A + B \ln \left( \frac{e(bx + a)}{dx + c} \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2,x)

[Out] int((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2,x)



**Maxima [B]** time = 1.83153, size = 3028, normalized size = 6.73

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2,x, algorithm="maxima")

[Out] 
$$\begin{aligned} & 1/4*A^2*b^2*d*g^2*i*x^4 + 1/3*A^2*b^2*c*g^2*i*x^3 + 2/3*A^2*a*b*d*g^2*i*x^3 \\ & + A^2*a*b*c*g^2*i*x^2 + 1/2*A^2*a^2*d*g^2*i*x^2 + 2*(x*\log(b*e*x/(d*x + c) \\ & + a*e/(d*x + c)) + a*\log(b*x + a)/b - c*\log(d*x + c)/d)*A*B*a^2*c*g^2*i \\ & + 2*(x^2*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*\log(b*x + a)/b^2 + c^2*\log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*a*b*c*g^2*i + 1/3*(2*x^3*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*\log(b*x + a)/b^3 - 2*c^3*\log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*b^2*c*g^2*i + (x^2*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*\log(b*x + a)/b^2 + c^2*\log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*a^2*d*g^2*i + 2/3*(2*x^3*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*\log(b*x + a)/b^3 - 2*c^3*\log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a*b*d*g^2*i + 1/12*(6*x^4*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*\log(b*x + a)/b^4 + 6*c^4*\log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*b^2*d*g^2*i + A^2*a^2*c*g^2*i*x - 1/12*(2*a^3*c*d^3*g^2*i + (2*g^2*i*\log(e) + g^2*i)*b^3*c^4 - 2*(4*g^2*i*\log(e) + g^2*i)*a*b^2*c^3*d + (12*g^2*i*\log(e) - g^2*i)*a^2*b*c^2*d^2)*B^2*\log(d*x + c)/(b*d^3) - 1/6*(b^4*c^4*g^2*i - 4*a*b^3*c^3*d*g^2*i + 6*a^2*b^2*c^2*d^2*g^2*i - 4*a^3*b*c*d^3*g^2*i + a^4*d^4*g^2*i)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^2*d^3) + 1/12*(3*B^2*b^4*d^4*g^2*i*x^4*log(e)^2 + 2*((2*g^2*i*\log(e)^2 - g^2*i*\log(e))*b^4*c*d^3 + (4*g^2*i*\log(e)^2 + g^2*i*\log(e))*a*b^3*d^4)*B^2*x^3 - ((g^2*i*\log(e) - g^2*i)*b^4*c^2*d^2 - 2*(6*g^2*i*\log(e)^2 - 2*g^2*i*\log(e) - g^2*i)*a*b^3*c*d^3 - (6*g^2*i*\log(e)^2 + 5*g^2*i*\log(e) + g^2*i)*a^2*b^2*d^4)*B^2*x^2 + ((2*g^2*i*\log(e) - g^2*i)*b^4*c^3*d - (8*g^2*i*\log(e) - 5*g^2*i)*a*b^3*c^2*d^2 + (12*g^2*i*\log(e)^2 + 4*g^2*i*\log(e) - 7*g^2*i)*a^2*b^2*c*d^3 + (2*g^2*i*\log(e) + 3*g^2*i)*a^3*b*d^4)*B^2*x + (3*B^2*b^4*d^4*g^2*i*x^4 + 12*B^2*a^2*b^2*c*d^3*g^2*i*x + 4*(b^4*c*d^3*g^2*i + 2*a*b^3*d^4*g^2*i)*B^2*x^3 + 6*(2*a*b^3*c*d^3*g^2*i + a^2*b^2*d^4*g^2*i)*B^2*x^2 + (4*a^3*b*c*d^3*g^2*i - a^4*d^4*g^2*i)*B^2)*log(b*x + a)^2 + (3*B^2*b^4*d^4*g^2*i*x^4 + 12*B^2*a^2*b^2*c*d^3*g^2*i*x + 4*(b^4*c*d^3*g^2*i + 2*a*b^3*d^4*g^2*i)*B^2*x^3 + 6*(2*a*b^3*c*d^3*g^2*i + a^2*b^2*d^4*g^2*i)*B^2*x^2 + (b^4*c^4*g^2*i - 4*a*b^3*c^3*d*g^2*i + 6*a^2*b^2*c^2*d^2*g^2*i)*B^2)*log(d*x + c)^2 + (6*B^2*b^4*d^4*g^2*i*x^4*log(e) + 2*((4*g^2*i*\log(e) - g^2*i)*b^4*c*d^3 + (8*g^2*i*\log(e) + g^2*i)*a*b^3*d^4)*B^2*x^3 - (b^4*c^2*d^2*g^2*i - 4*(6*g^2*i*\log(e) - g^2*i)*a*b^3*c*d^3 - (12*g^2*i* \end{aligned}$$

```

i*log(e) + 5*g^2*i)*a^2*b^2*d^4)*B^2*x^2 + 2*(b^4*c^3*d*g^2*i - 4*a*b^3*c^2
*d^2*g^2*i + a^3*b*d^4*g^2*i + 2*(6*g^2*i*log(e) + g^2*i)*a^2*b^2*c*d^3)*B^
2*x + (2*a*b^3*c^3*d*g^2*i - 7*a^2*b^2*c^2*d^2*g^2*i + 2*(4*g^2*i*log(e) +
3*g^2*i)*a^3*b*c*d^3 - (2*g^2*i*log(e) + g^2*i)*a^4*d^4)*B^2)*log(b*x + a)
- (6*B^2*b^4*d^4*g^2*i*x^4*log(e) + 2*((4*g^2*i*log(e) - g^2*i)*b^4*c*d^3 +
(8*g^2*i*log(e) + g^2*i)*a*b^3*d^4)*B^2*x^3 - (b^4*c^2*d^2*g^2*i - 4*(6*g^
2*i*log(e) - g^2*i)*a*b^3*c*d^3 - (12*g^2*i*log(e) + 5*g^2*i)*a^2*b^2*d^4)*
B^2*x^2 + 2*(b^4*c^3*d*g^2*i - 4*a*b^3*c^2*d^2*g^2*i + a^3*b*d^4*g^2*i + 2*
(6*g^2*i*log(e) + g^2*i)*a^2*b^2*c*d^3)*B^2*x + 2*(3*B^2*b^4*d^4*g^2*i*x^4
+ 12*B^2*a^2*b^2*c*d^3*g^2*i*x + 4*(b^4*c*d^3*g^2*i + 2*a*b^3*d^4*g^2*i)*B^
2*x^3 + 6*(2*a*b^3*c*d^3*g^2*i + a^2*b^2*d^4*g^2*i)*B^2*x^2 + (4*a^3*b*c*d^
3*g^2*i - a^4*d^4*g^2*i)*B^2)*log(b*x + a))*log(d*x + c))/(b^2*d^3)

```

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( A^2 b^2 d g^2 i x^3 + A^2 a^2 c g^2 i + (A^2 b^2 c + 2 A^2 a b d) g^2 i x^2 + (2 A^2 a b c + A^2 a^2 d) g^2 i x + (B^2 b^2 d g^2 i x^3 + B^2 a^2 c g^2 i + (B^2 b^2 c + 2 B^2 a b d) g^2 i x^2 + (2 B^2 a b c + B^2 a^2 d) g^2 i x) \log\left(\frac{b e x + a e}{d x + c}\right)^2 + 2 (A B b^2 d g^2 i x^3 + A B a^2 c g^2 i + (A B b^2 c + 2 A B a b d) g^2 i x^2 + (2 A B a b c + A B a^2 d) g^2 i x) \log\left(\frac{b e x + a e}{d x + c}\right), x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```

[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algo
rithm="fricas")

```

```

[Out] integral(A^2*b^2*d*g^2*i*x^3 + A^2*a^2*c*g^2*i + (A^2*b^2*c + 2*A^2*a*b*d)*
g^2*i*x^2 + (2*A^2*a*b*c + A^2*a^2*d)*g^2*i*x + (B^2*b^2*d*g^2*i*x^3 + B^2*
a^2*c*g^2*i + (B^2*b^2*c + 2*B^2*a*b*d)*g^2*i*x^2 + (2*B^2*a*b*c + B^2*a^2*
d)*g^2*i*x)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*b^2*d*g^2*i*x^3 + A*B*a
^2*c*g^2*i + (A*B*b^2*c + 2*A*B*a*b*d)*g^2*i*x^2 + (2*A*B*a*b*c + A*B*a^2*d
)*g^2*i*x)*log((b*e*x + a*e)/(d*x + c)), x)

```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```

[In] integrate((b*g*x+a*g)**2*(d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)

```

```

[Out] Timed out

```

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int (bgx + ag)^2 (dix + ci) \left( B \log \left( \frac{(bx + a)e}{dx + c} \right) + A \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2,x, algorithm="giac")

[Out] integrate((b\*g\*x + a\*g)^2\*(d\*i\*x + c\*i)\*(B\*log((b\*x + a)\*e/(d\*x + c)) + A)^2, x)

$$3.57 \quad \int (ag + bgx)(ci + dix) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx$$

**Optimal.** Leaf size=343

$$\frac{B^2 gi(bc - ad)^3 \text{PolyLog} \left( 2, \frac{d(a+bx)}{b(c+dx)} \right)}{3b^2 d^2} - \frac{B gi(bc - ad)^3 \log \left( \frac{bc-ad}{b(c+dx)} \right) \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A + B \right)}{3b^2 d^2} - \frac{B gi(a + bx)(bc - ad)^2 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A + B \right)}{3b^2 d}$$

[Out] (B^2\*(b\*c - a\*d)^2\*g\*i\*x)/(3\*b\*d) - (B\*(b\*c - a\*d)^2\*g\*i\*(a + b\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(3\*b^2\*d) - (B\*(b\*c - a\*d)\*g\*i\*(a + b\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(3\*b^2) + ((b\*c - a\*d)\*g\*i\*(a + b\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]])^2)/(6\*b^2) + (g\*i\*(a + b\*x)^2\*(c + d\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]])^2)/(3\*b) - (B\*(b\*c - a\*d)^3\*g\*i\*Log[(b\*c - a\*d)/(b\*(c + d\*x))]\*(A + B + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(3\*b^2\*d^2) - (B^2\*(b\*c - a\*d)^3\*g\*i\*Log[c + d\*x])/(3\*b^2\*d^2) - (B^2\*(b\*c - a\*d)^3\*g\*i\*PolyLog[2, (d\*(a + b\*x))/(b\*(c + d\*x))])/(3\*b^2\*d^2)

**Rubi [B]** time = 2.8165, antiderivative size = 1214, normalized size of antiderivative = 3.54, number of steps used = 78, number of rules used = 14, integrand size = 38,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.368$ , Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 2486, 31, 72}

$$-\frac{B^2 d gi \log^2(a + bx) a^3}{3b^2} + \frac{2B d gi \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) a^3}{3b^2} + \frac{2B^2 d gi \log(a + bx) \log \left( \frac{b(c+dx)}{bc-ad} \right) a^3}{3b^2} + \frac{2B^2 d gi \text{PolyLog} \left( 2, \frac{d(a+bx)}{b(c+dx)} \right) a^3}{3b^2}$$

Antiderivative was successfully verified.

[In] Int[(a\*g + b\*g\*x)\*(c\*i + d\*i\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]])^2,x]

[Out] (-2\*A\*b\*B\*(a^2/b^2 - c^2/d^2)\*d\*g\*i\*x)/3 + (B^2\*(b\*c - a\*d)^2\*g\*i\*x)/(3\*b\*d) - (A\*B\*(b\*c - a\*d)\*(b\*c + a\*d)\*g\*i\*x)/(b\*d) + (a^2\*B^2\*(b\*c - a\*d)\*g\*i\*Log[a + b\*x])/(3\*b^2) - (a^2\*B^2\*c\*g\*i\*Log[a + b\*x]^2)/b - (a^3\*B^2\*d\*g\*i\*Log[a + b\*x]^2)/(3\*b^2) + (a^2\*B^2\*(b\*c + a\*d)\*g\*i\*Log[a + b\*x]^2)/(2\*b^2) - (B^2\*(b\*c - a\*d)\*(b\*c + a\*d)\*g\*i\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x)]/(3\*b^2\*d) - (B\*(b\*c - a\*d)\*g\*i\*x^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/3 + (2\*a^2\*B\*c\*g\*i\*Log[a + b\*x]\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/b + (2\*a^3\*B\*d\*g\*i\*Log[a + b\*x]\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/3 - (a^2\*B\*(b\*c + a\*d)\*g\*i\*Log[a + b\*x]\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/b^2 + a\*c\*g\*i\*x\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]])^2 + ((b\*c + a\*d)\*g\*i\*x^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]])^2)/2 + (b\*d\*g\*i\*x^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]])^2)/2

$$\begin{aligned} & x)/(c + dx)]^2)/3 - (B^2*c^2*(b*c - a*d)*g*i*Log[c + dx])/(3*d^2) + (B^2*(b*c - a*d)^2*(b*c + a*d)*g*i*Log[c + dx])/(3*b^2*d^2) + (2*b*B^2*c^3*g*i*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + dx])/(3*d^2) + (2*a*B^2*c^2*g*i*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + dx])/d - (B^2*c^2*(b*c + a*d)*g*i*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + dx])/d^2 - (2*b*B*c^3*g*i*(A + B*Log[(e*(a + b*x))/(c + dx)])*Log[c + dx])/(3*d^2) - (2*a*B*c^2*g*i*(A + B*Log[(e*(a + b*x))/(c + dx)])*Log[c + dx])/d + (B*c^2*(b*c + a*d)*g*i*(A + B*Log[(e*(a + b*x))/(c + dx)])*Log[c + dx])/d^2 - (b*B^2*c^3*g*i*Log[c + dx]^2)/(3*d^2) - (a*B^2*c^2*g*i*Log[c + dx]^2)/d + (B^2*c^2*(b*c + a*d)*g*i*Log[c + dx]^2)/(2*d^2) + (2*a^2*B^2*c*g*i*Log[a + b*x]*Log[(b*(c + dx))/(b*c - a*d)]/b + (2*a^3*B^2*d*g*i*Log[a + b*x]*Log[(b*(c + dx))/(b*c - a*d)]/(3*b^2) - (a^2*B^2*(b*c + a*d)*g*i*Log[a + b*x]*Log[(b*(c + dx))/(b*c - a*d)]/b^2 + (2*a^2*B^2*c*g*i*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/b + (2*a^3*B^2*d*g*i*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/ (3*b^2) - (a^2*B^2*(b*c + a*d)*g*i*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/b^2 + (2*b*B^2*c^3*g*i*PolyLog[2, (b*(c + dx))/(b*c - a*d)]/(3*d^2) + (2*a*B^2*c^2*g*i*PolyLog[2, (b*(c + dx))/(b*c - a*d)]/d - (B^2*c^2*(b*c + a*d)*g*i*PolyLog[2, (b*(c + dx))/(b*c - a*d)]/d^2 \end{aligned}$$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] := Simp[x*(a + b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol]
:= With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(q_.), x_Symbol]
:= Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol]
:= Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol]
:= Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol]
:= Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
```

IntegerQ[m]) && NeQ[m, -1]

### Rule 2486

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.))  
^(r\_.)]^(s\_.), x\_Symbol] := Simp[((a + b\*x)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^  
q]^r]^s)/b, x] + Dist[(q\*r\*s\*(b\*c - a\*d))/b, Int[Log[e\*(f\*(a + b\*x)^p\*(c +  
d\*x)^q]^r]^(s - 1)/(c + d\*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s  
}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]

### Rule 31

Int[((a\_.) + (b\_.)\*(x\_))^(p\_.), x\_Symbol] := Simp[Log[RemoveContent[a + b\*x,  
x]]/b, x] /; FreeQ[{a, b}, x]

### Rule 72

Int[((e\_.) + (f\_.)\*(x\_))^(p\_.)/(((a\_.) + (b\_.)\*(x\_))\*((c\_.) + (d\_.)\*(x\_))),  
x\_Symbol] := Int[ExpandIntegrand[(e + f\*x)^p/((a + b\*x)\*(c + d\*x)), x], x]  
/; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]

### Rubi steps

$$\begin{aligned}
\int (57c + 57dx)(ag + bgx) \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right)^2 dx &= \int \left( 57acg \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right)^2 + 57(bc + ad)gx \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right) \right) dx \\
&= (57acg) \int \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right)^2 dx + (57bdg) \int x^2 \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right) dx \\
&= 57acgx \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right)^2 + \frac{57}{2}(bc + ad)gx^2 \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right) \\
&= 57acgx \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right)^2 + \frac{57}{2}(bc + ad)gx^2 \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right) \\
&= 57acgx \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right)^2 + \frac{57}{2}(bc + ad)gx^2 \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right) \\
&= 57acgx \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right)^2 + \frac{57}{2}(bc + ad)gx^2 \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right) \\
&= -\frac{19AB(bc - ad)(bc + ad)gx}{bd} - 19B(bc - ad)gx^2 \left( A + B \log \left( \frac{e(a + bx)}{c + dx} \right) \right) \\
&= -\frac{19AB(bc - ad)(bc + ad)gx}{bd} - \frac{19B^2(bc - ad)(bc + ad)g(a + bx)}{b^2d} \\
&= -\frac{19AB(bc - ad)(bc + ad)gx}{bd} - \frac{19B^2(bc - ad)(bc + ad)g(a + bx)}{b^2d} \\
&= \frac{19B^2(bc - ad)^2gx}{bd} - \frac{19AB(bc - ad)(bc + ad)gx}{bd} + \frac{19a^2B^2(bc - ad)}{b^2d} \\
&= \frac{19B^2(bc - ad)^2gx}{bd} - \frac{19AB(bc - ad)(bc + ad)gx}{bd} + \frac{19a^2B^2(bc - ad)}{b^2d} \\
&= \frac{19B^2(bc - ad)^2gx}{bd} - \frac{19AB(bc - ad)(bc + ad)gx}{bd} + \frac{19a^2B^2(bc - ad)}{b^2d} \\
&= \frac{19B^2(bc - ad)^2gx}{bd} - \frac{19AB(bc - ad)(bc + ad)gx}{bd} + \frac{19a^2B^2(bc - ad)}{b^2d}
\end{aligned}$$



**Mathematica [B]** time = 0.700155, size = 869, normalized size = 2.53

$$gi\left(2b^3B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx)c^3-b^3B^2\left(\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\log(c+dx)+2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)\right)\right)$$

Antiderivative was successfully verified.

[In] Integrate[(a\*g + b\*g\*x)\*(c\*i + d\*i\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2,x]

[Out] (g\*i\*(-6\*A\*b^2\*B\*c\*d\*(b\*c - a\*d)\*x + 6\*A\*A\*b\*B\*d^2\*(-(b\*c) + a\*d)\*x + 4\*A\*b\*B\*d\*(b\*c - a\*d)\*(b\*c + a\*d)\*x - 6\*b\*B^2\*c\*d\*(b\*c - a\*d)\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x)] + 6\*a\*B^2\*d^2\*(-(b\*c) + a\*d)\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x)] + 4\*B^2\*d\*(b\*c - a\*d)\*(b\*c + a\*d)\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x)] - 2\*b^2\*B\*d^2\*(b\*c - a\*d)\*x^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) + 6\*a^2\*b\*B\*c\*d^2\*Log[a + b\*x]\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) - 2\*a^3\*B\*d^3\*Log[a + b\*x]\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) + 6\*a\*b^2\*c\*d^2\*x\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2 + 3\*b^2\*d^2\*(b\*c + a\*d)\*x^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2 + 2\*b^3\*d^3\*x^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2 + 6\*b\*B^2\*c\*(b\*c - a\*d)^2\*Log[c + d\*x] + 6\*a\*B^2\*d\*(b\*c - a\*d)^2\*Log[c + d\*x] - 4\*B^2\*(b\*c - a\*d)^2\*(b\*c + a\*d)\*Log[c + d\*x] + 2\*b^3\*B\*c^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])\*Log[c + d\*x] - 6\*a\*b^2\*B\*c^2\*d\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])\*Log[c + d\*x] + 2\*B^2\*(b\*c - a\*d)\*(a^2\*d^2\*Log[a + b\*x] - b\*(d\*(-(b\*c) + a\*d)\*x + b\*c^2\*Log[c + d\*x])) - 3\*a^2\*b\*B^2\*c\*d^2\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]) - 2\*PolyLog[2, (d\*(a + b\*x))/(-(b\*c) + a\*d)]) + a^3\*B^2\*d^3\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]) - 2\*PolyLog[2, (d\*(a + b\*x))/(-(b\*c) + a\*d)]) - b^3\*B^2\*c^3\*((2\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)] - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)]) + 3\*a\*b^2\*B^2\*c^2\*d\*((2\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)] - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])))/(6\*b^2\*d^2)

**Maple [F]** time = 2.007, size = 0, normalized size = 0.

$$\int (bgx + ag)(dix + ci)\left(A + B\ln\left(\frac{e(bx + a)}{dx + c}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2,x)

[Out]  $\int ((b*g*x+a*g)*(d*i*x+c*i)*(A+B*\ln(e*(b*x+a)/(d*x+c)))^2, x)$

**Maxima [B]** time = 1.69641, size = 1690, normalized size = 4.93

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*g*x+a*g)*(d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima")`

[Out]  $\frac{1}{3}A^2b*d*g*i*x^3 + \frac{1}{2}A^2b*c*g*i*x^2 + \frac{1}{2}A^2a*d*g*i*x^2 + 2*(x*\log(b*e*x/(d*x+c) + a*e/(d*x+c)) + a*\log(b*x+a)/b - c*\log(d*x+c)/d)*A*B*a*c*g*i + (x^2*\log(b*e*x/(d*x+c) + a*e/(d*x+c)) - a^2*\log(b*x+a)/b^2 + c^2*\log(d*x+c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*b*c*g*i + (x^2*\log(b*e*x/(d*x+c) + a*e/(d*x+c)) - a^2*\log(b*x+a)/b^2 + c^2*\log(d*x+c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*a*d*g*i + \frac{1}{3}*(2*x^3*\log(b*e*x/(d*x+c) + a*e/(d*x+c)) + 2*a^3*\log(b*x+a)/b^3 - 2*c^3*\log(d*x+c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*b*d*g*i + A^2*a*c*g*i*x + \frac{1}{3}*(b^2*c^3*g*i*\log(e) - a^2*c*d^2*g*i - (3*g*i*\log(e) - g*i)*a*b*c^2*d)*B^2*\log(d*x+c)/(b*d^2) + \frac{1}{3}*(b^3*c^3*g*i - 3*a*b^2*c^2*d*g*i + 3*a^2*b*c*d^2*g*i - a^3*d^3*g*i)*(log(b*x+a)*log((b*d*x+a*d)/(b*c-a*d) + 1) + dilog(-(b*d*x+a*d)/(b*c-a*d)))*B^2/(b^2*d^2) + \frac{1}{6}*(2*B^2*b^3*d^3*g*i*x^3*\log(e)^2 + ((3*g*i*\log(e)^2 - 2*g*i*\log(e))*b^3*c*d^2 + (3*g*i*\log(e)^2 + 2*g*i*\log(e))*a*b^2*d^3)*B^2*x^2 - 2*((g*i*\log(e) - g*i)*b^3*c^2*d - (3*g*i*\log(e)^2 - 2*g*i)*a*b^2*c*d^2 - (g*i*\log(e) + g*i)*a^2*b*d^3)*B^2*x + (2*B^2*b^3*d^3*g*i*x^3 + 6*B^2*a*b^2*c*d^2*g*i*x + 3*(b^3*c*d^2*g*i + a*b^2*d^3*g*i)*B^2*x^2 + (3*a^2*b*c*d^2*g*i - a^3*d^3*g*i)*B^2)*log(b*x+a)^2 + (2*B^2*b^3*d^3*g*i*x^3 + 6*B^2*a*b^2*c*d^2*g*i*x + 3*(b^3*c*d^2*g*i + a*b^2*d^3*g*i)*B^2*x^2 - (b^3*c^3*g*i - 3*a*b^2*c^2*d*g*i)*B^2)*log(d*x+c)^2 + 2*(2*B^2*b^3*d^3*g*i*x^3*\log(e) + ((3*g*i*\log(e) - g*i)*b^3*c*d^2 + (3*g*i*\log(e) + g*i)*a*b^2*d^3)*B^2*x^2 + (6*a*b^2*c*d^2*g*i*\log(e) - b^3*c^2*d*g*i + a^2*b*d^3*g*i)*B^2*x - (a^3*d^3*g*i*\log(e) + a*b^2*c^2*d*g*i - (3*g*i*\log(e) + g*i)*a^2*b*c*d^2)*B^2)*log(b*x+a) - 2*(2*B^2*b^3*d^3*g*i*x^3*\log(e) + ((3*g*i*\log(e) - g*i)*b^3*c*d^2 + (3*g*i*\log(e) + g*i)*a*b^2*d^3)*B^2*x^2 + (6*a*b^2*c*d^2*g*i*\log(e) - b^3*c^2*d*g*i + a^2*b*d^3*g*i)*B^2*x + (2*B^2*b^3*d^3*g*i*x^3 + 6*B^2*a*b^2*c*d^2*g*i*x + 3*(b^3*c*d^2*g*i + a*b^2*d^3*g*i)*B^2*x^2 + (3*a^2*b*c*d^2*g*i - a^3*d^3*g*i)*B^2)*log(b*x+a))*log(d*x+c)/(b^2*d^2)$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( A^2 b d g i x^2 + A^2 a c g i + (A^2 b c + A^2 a d) g i x + (B^2 b d g i x^2 + B^2 a c g i + (B^2 b c + B^2 a d) g i x) \log \left( \frac{b e x + a e}{d x + c} \right)^2 + 2 (A B \right.$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2,x, algorithm="fricas")

[Out] integral(A^2\*b\*d\*g\*i\*x^2 + A^2\*a\*c\*g\*i + (A^2\*b\*c + A^2\*a\*d)\*g\*i\*x + (B^2\*b\*d\*g\*i\*x^2 + B^2\*a\*c\*g\*i + (B^2\*b\*c + B^2\*a\*d)\*g\*i\*x)\*log((b\*e\*x + a\*e)/(d\*x + c))^2 + 2\*(A\*B\*b\*d\*g\*i\*x^2 + A\*B\*a\*c\*g\*i + (A\*B\*b\*c + A\*B\*a\*d)\*g\*i\*x)\*log((b\*e\*x + a\*e)/(d\*x + c)), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))\*\*2,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int (b g x + a g) (d i x + c i) \left( B \log \left( \frac{(b x + a) e}{d x + c} \right) + A \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2,x, algorithm="giac")

[Out] integrate((b\*g\*x + a\*g)\*(d\*i\*x + c\*i)\*(B\*log((b\*x + a)\*e/(d\*x + c)) + A)^2, x)

$$3.58 \quad \int (ci + dix) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx$$

**Optimal.** Leaf size=203

$$-\frac{B^2 i(bc - ad)^2 \text{PolyLog}\left(2, \frac{b(c+dx)}{d(a+bx)}\right)}{b^2 d} + \frac{Bi(bc - ad)^2 \log\left(1 - \frac{b(c+dx)}{d(a+bx)}\right) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{b^2 d} - \frac{Bi(a + bx)(bc - ad) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{b^2}$$

[Out]  $-\left(\frac{B^2 i(bc - ad)^2 \text{PolyLog}\left[2, \frac{b(c + dx)}{d(a + bx)}\right]}{b^2 d} + \frac{Bi(bc - ad)^2 \log\left[1 - \frac{b(c + dx)}{d(a + bx)}\right] \left(B \log\left[\frac{e(a + bx)}{c + dx}\right] + A\right)}{b^2 d} - \frac{Bi(a + bx)(bc - ad) \left(B \log\left[\frac{e(a + bx)}{c + dx}\right] + A\right)}{b^2}\right) + \left(\frac{i(c + dx)^2 \left(B \log\left[\frac{e(a + bx)}{c + dx}\right] + A\right)^2}{2d} + \frac{B^2 i(bc - ad)^2 \text{PolyLog}\left[2, \frac{b(c + dx)}{d(a + bx)}\right]}{b^2 d} + \frac{Bi(bc - ad)^2 \log\left[1 - \frac{b(c + dx)}{d(a + bx)}\right] \left(B \log\left[\frac{e(a + bx)}{c + dx}\right] + A\right)}{b^2 d} - \frac{Bi(a + bx)(bc - ad) \left(B \log\left[\frac{e(a + bx)}{c + dx}\right] + A\right)}{b^2}\right)$

**Rubi [A]** time = 0.432791, antiderivative size = 283, normalized size of antiderivative = 1.39, number of steps used = 16, number of rules used = 12, integrand size = 30,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.4$ , Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{B^2 i(bc - ad)^2 \text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{b^2 d} - \frac{Bi(bc - ad)^2 \log(a + bx) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{b^2 d} + \frac{i(c + dx)^2 \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)^2}{2d}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[(c*i + d*i*x)*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])^2, x]$

[Out]  $-\left(\frac{A*B*(b*c - a*d)*i*x}{b} + \frac{B^2*(b*c - a*d)^2*i*\text{Log}[a + b*x]^2}{2*b^2*d} - \frac{B^2*(b*c - a*d)*i*(a + b*x)*\text{Log}[(e*(a + b*x))/(c + d*x)]}{b^2} - \frac{B*(b*c - a*d)^2*i*\text{Log}[a + b*x]*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])}{b^2*d} + \frac{i*(c + d*x)^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])^2}{2*d} + \frac{B^2*(b*c - a*d)^2*i*\text{Log}[c + d*x]}{b^2*d} - \frac{B^2*(b*c - a*d)^2*i*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)]}{b^2*d} - \frac{B^2*(b*c - a*d)^2*i*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]}{b^2*d}\right)$

**Rule 2525**

$\text{Int}[(a_. + \text{Log}[c_.*(\text{RFx}_.)^{(p_.)}]*(b_.))^{(n_.)}*((d_.) + (e_.)*(x_.))^{(m_.)}, x\_Symbol] \rightarrow \text{Simp}[(d + e*x)^{(m + 1)}*(a + b*\text{Log}[c*\text{RFx}^p])^n/(e*(m + 1)), x] - \text{Dist}[(b*n*p)/(e*(m + 1)), \text{Int}[\text{SimplifyIntegrand}[(d + e*x)^{(m + 1)}*(a + b*\text{Log}[c*\text{RFx}^p])^{(n - 1)}*D[\text{RFx}, x]/\text{RFx}, x], x] /;$  FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||

IntegerQ[m]) && NeQ[m, -1]

### Rule 12

Int[(a\_)\*(u\_), x\_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b\_)\*(v\_)] /; FreeQ[b, x]

### Rule 2528

Int[((a\_.) + Log[(c\_.)\*(RFX\_)^(p\_.)]\*(b\_.))^(n\_.)\*(RGx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*RFX^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFX, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

### Rule 2486

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.), x\_Symbol] := Simp[((a + b\*x)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/b, x] + Dist[(q\*r\*s\*(b\*c - a\*d))/b, Int[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1)/(c + d\*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]

### Rule 31

Int[((a\_) + (b\_.)\*(x\_))^-1), x\_Symbol] := Simp[Log[RemoveContent[a + b\*x, x]]/b, x] /; FreeQ[{a, b}, x]

### Rule 2524

Int[((a\_.) + Log[(c\_.)\*(RFX\_)^(p\_.)]\*(b\_.))^(n\_.)/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[d + e\*x]\*(a + b\*Log[c\*RFX^p])^n)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[d + e\*x]\*(a + b\*Log[c\*RFX^p])^(n - 1)\*D[RFX, x])/RFX, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0]

### Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*(RFX\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n])^p, RFX, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFX, x] && IntegerQ[p]

### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.)\*(x\_))^(q\_.), x\_Symbol] := Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^

$n])^p, x], x, d + e*x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, n, p, q\}, x] \&\& \text{EqQ}[e*f - d*g, 0]$

### Rule 2301

$\text{Int}[(a_.) + \text{Log}[(c_.)*(x_)^{(n_.)}]*(b_.)]/(x_), x\_Symbol] \rightarrow \text{Simp}[(a + b*\text{Log}[c*x^n])^2/(2*b*n), x] /; \text{FreeQ}\{a, b, c, n\}, x]$

### Rule 2394

$\text{Int}[(a_.) + \text{Log}[(c_.)*((d_) + (e_.)*(x_))^{(n_.)}]*(b_.)]/((f_.) + (g_.)*(x_)), x\_Symbol] \rightarrow \text{Simp}[(\text{Log}[(e*(f + g*x))/(e*f - d*g)]*(a + b*\text{Log}[c*(d + e*x)^n]))/g, x] - \text{Dist}[(b*e*n)/g, \text{Int}[\text{Log}[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, n\}, x] \&\& \text{NeQ}[e*f - d*g, 0]$

### Rule 2393

$\text{Int}[(a_.) + \text{Log}[(c_.)*((d_) + (e_.)*(x_))]*(b_.)]/((f_.) + (g_.)*(x_)), x\_Symbol] \rightarrow \text{Dist}[1/g, \text{Subst}[\text{Int}[(a + b*\text{Log}[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g\}, x] \&\& \text{NeQ}[e*f - d*g, 0] \&\& \text{EqQ}[g + c*(e*f - d*g), 0]$

### Rule 2391

$\text{Int}[\text{Log}[(c_.)*((d_) + (e_.)*(x_))^{(n_.)}]]/(x_), x\_Symbol] \rightarrow -\text{Simp}[\text{PolyLog}[2, -(c*e*x^n)]/n, x] /; \text{FreeQ}\{c, d, e, n\}, x] \&\& \text{EqQ}[c*d, 1]$

### Rubi steps

$$\begin{aligned}
\int (58c + 58dx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx &= \frac{29(c+dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d} - \frac{B \int \frac{3364(bc-ad)(c+dx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{a+bx}}{58d} \\
&= \frac{29(c+dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d} - \frac{(58B(bc-ad)) \int \frac{(c+dx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{a+bx}}{d} \\
&= \frac{29(c+dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d} - \frac{(58B(bc-ad)) \int \left( \frac{d \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b} \right)}{d} \\
&= \frac{29(c+dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d} - \frac{(58B(bc-ad)) \int \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b} \\
&= -\frac{58AB(bc-ad)x}{b} - \frac{58B(bc-ad)^2 \log(a+bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2 d} + \dots \\
&= -\frac{58AB(bc-ad)x}{b} - \frac{58B^2(bc-ad)(a+bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^2} - \frac{58B(bc-ad)}{b^2} \\
&= -\frac{58AB(bc-ad)x}{b} - \frac{58B^2(bc-ad)(a+bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^2} - \frac{58B(bc-ad)}{b^2} \\
&= -\frac{58AB(bc-ad)x}{b} - \frac{58B^2(bc-ad)(a+bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^2} - \frac{58B(bc-ad)}{b^2} \\
&= -\frac{58AB(bc-ad)x}{b} - \frac{58B^2(bc-ad)(a+bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^2} - \frac{58B(bc-ad)}{b^2} \\
&= -\frac{58AB(bc-ad)x}{b} + \frac{29B^2(bc-ad)^2 \log^2(a+bx)}{b^2 d} - \frac{58B^2(bc-ad)(a+bx)}{b^2} \\
&= -\frac{58AB(bc-ad)x}{b} + \frac{29B^2(bc-ad)^2 \log^2(a+bx)}{b^2 d} - \frac{58B^2(bc-ad)(a+bx)}{b^2}
\end{aligned}$$

**Mathematica [A]** time = 0.207744, size = 205, normalized size = 1.01

$$\frac{i \left( (c+dx)^2 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)^2 - \frac{B(bc-ad) \left( 2B(bc-ad) \text{PolyLog} \left( 2, \frac{d(a+bx)}{ad-bc} \right) + 2(bc-ad) \log(a+bx) \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + B \log \left( \frac{b(c+dx)}{bc-ad} \right) + A \right) + 2(Bd(a+bx) \right)}{b^2} \right)}{2d}$$

Antiderivative was successfully verified.

[In] Integrate[(c\*i + d\*i\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2,x]

[Out] (i\*((c + d\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2 - (B\*(b\*c - a\*d)\*((- (b\*B\*c) + a\*B\*d)\*Log[a + b\*x]^2 + 2\*(A\*b\*d\*x + B\*d\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x)] + (- (b\*B\*c) + a\*B\*d)\*Log[c + d\*x]) + 2\*(b\*c - a\*d)\*Log[a + b\*x]\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)] + B\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]) + 2\*B\*(b\*c - a\*d)\*PolyLog[2, (d\*(a + b\*x))/(- (b\*c) + a\*d)]))/b^2)/(2\*d)

**Maple [F]** time = 1.796, size = 0, normalized size = 0.

$$\int (dix + ci) \left( A + B \ln \left( \frac{e(bx + a)}{dx + c} \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*i\*x+c\*i)\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2,x)

[Out] int((d\*i\*x+c\*i)\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2,x)

**Maxima [B]** time = 1.6418, size = 855, normalized size = 4.21

$$\frac{1}{2} A^2 dix^2 + 2 \left( x \log \left( \frac{bex}{dx + c} + \frac{ae}{dx + c} \right) + \frac{a \log(bx + a)}{b} - \frac{c \log(dx + c)}{d} \right) ABci + \left( x^2 \log \left( \frac{bex}{dx + c} + \frac{ae}{dx + c} \right) - \frac{a^2 \log(bx + a)}{b^2} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2,x, algorithm="maxima")

[Out] 1/2\*A^2\*d\*i\*x^2 + 2\*(x\*log(b\*e\*x/(d\*x + c) + a\*e/(d\*x + c)) + a\*log(b\*x + a)/b - c\*log(d\*x + c)/d)\*A\*B\*c\*i + (x^2\*log(b\*e\*x/(d\*x + c) + a\*e/(d\*x + c)) - a^2\*log(b\*x + a)/b^2 + c^2\*log(d\*x + c)/d^2 - (b\*c - a\*d)\*x/(b\*d))\*A\*B\*d\*i + A^2\*c\*i\*x - ((i\*log(e) - i)\*b\*c^2 + a\*c\*d\*i)\*B^2\*log(d\*x + c)/(b\*d) - (b^2\*c^2\*i - 2\*a\*b\*c\*d\*i + a^2\*d^2\*i)\*(log(b\*x + a)\*log((b\*d\*x + a\*d)/(b\*c - a\*d) + 1) + dilog(-(b\*d\*x + a\*d)/(b\*c - a\*d)))\*B^2/(b^2\*d) + 1/2\*(B^2\*b^2\*d^2\*i\*x^2\*log(e)^2 + 2\*(a\*b\*d^2\*i\*log(e) + (i\*log(e))^2 - i\*log(e))\*b^2\*c\*d)\*B^2\*x + (B^2\*b^2\*d^2\*i\*x^2 + 2\*B^2\*b^2\*c\*d\*i\*x + (2\*a\*b\*c\*d\*i - a^2\*d^2\*i)\*B^2)\*log(b\*x + a)^2 + (B^2\*b^2\*d^2\*i\*x^2 + 2\*B^2\*b^2\*c\*d\*i\*x + B^2\*b^2\*c^2\*i)\*log(d\*x + c)^2 + 2\*(B^2\*b^2\*d^2\*i\*x^2\*log(e) + ((2\*i\*log(e) - i)\*b^2\*c



$*d + a*b*d^{2*i}*B^2*x + ((2*i*\log(e) - i)*a*b*c*d - (i*\log(e) - i)*a^{2*d^2})$   
 $*B^2)*\log(b*x + a) - 2*(B^2*b^2*d^{2*i}*x^2*\log(e) + ((2*i*\log(e) - i)*b^{2*c}$   
 $d + a*b*d^{2*i}*B^2*x + (B^2*b^2*d^{2*i}*x^2 + 2*B^2*b^2*c*d*i*x + (2*a*b*c*d*$   
 $i - a^{2*d^2*i}*B^2)*\log(b*x + a))*\log(d*x + c))/(b^2*d)$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2dix + A^2ci + (B^2dix + B^2ci) \log\left(\frac{bex + ae}{dx + c}\right)^2 + 2(ABdix + ABci) \log\left(\frac{bex + ae}{dx + c}\right), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2,x, algorithm="fricas")

[Out] integral(A^2\*d\*i\*x + A^2\*c\*i + (B^2\*d\*i\*x + B^2\*c\*i)\*log((b\*e\*x + a\*e)/(d\*x + c))^2 + 2\*(A\*B\*d\*i\*x + A\*B\*c\*i)\*log((b\*e\*x + a\*e)/(d\*x + c)), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c))))\*\*2,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int (dix + ci) \left( B \log\left(\frac{(bx + a)e}{dx + c}\right) + A \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2,x, algorithm="giac")

[Out] integrate((d\*i\*x + c\*i)\*(B\*log((b\*x + a)\*e/(d\*x + c)) + A)^2, x)

$$3.59 \quad \int \frac{(ci+dx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{ag+bgx} dx$$

**Optimal.** Leaf size=286

$$\frac{2Bi(bc-ad)\text{PolyLog}\left(2, \frac{b(c+dx)}{d(a+bx)}\right) \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{b^2g} + \frac{2B^2i(bc-ad)\text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)}{b^2g} + \frac{2B^2i(bc-ad)\text{PolyLog}\left(3, \frac{d(a+bx)}{b(c+dx)}\right)}{b^2g}$$

[Out] (2\*B\*(b\*c - a\*d)\*i\*Log[(b\*c - a\*d)/(b\*(c + d\*x))]\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(b^2\*g) + (d\*i\*(a + b\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2)/(b^2\*g) - ((b\*c - a\*d)\*i\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2\*Log[1 - (b\*(c + d\*x))/(d\*(a + b\*x))])/(b^2\*g) + (2\*B^2\*(b\*c - a\*d)\*i\*PolyLog[2, (d\*(a + b\*x))/(b\*(c + d\*x))])/(b^2\*g) + (2\*B\*(b\*c - a\*d)\*i\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])\*PolyLog[2, (b\*(c + d\*x))/(d\*(a + b\*x))])/(b^2\*g) + (2\*B^2\*(b\*c - a\*d)\*i\*PolyLog[3, (b\*(c + d\*x))/(d\*(a + b\*x))])/(b^2\*g)

**Rubi [B]** time = 2.93939, antiderivative size = 644, normalized size of antiderivative = 2.25, number of steps used = 39, number of rules used = 19, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.475$ , Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610}

$$\frac{2ABi(bc-ad)\text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{b^2g} + \frac{2B^2i(bc-ad)\text{PolyLog}\left(2, \frac{bc-ad}{d(a+bx)} + 1\right) \log\left(\frac{e(a+bx)}{c+dx}\right)}{b^2g} + \frac{2aB^2di\text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{b^2g}$$

Antiderivative was successfully verified.

[In] Int[((c\*i + d\*i\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2)/(a\*g + b\*g\*x), x]

[Out] -((a\*B^2\*d\*i\*Log[a + b\*x]^2)/(b^2\*g)) - (A\*B\*(b\*c - a\*d)\*i\*Log[a + b\*x]^2)/(b^2\*g) - (B^2\*(b\*c - a\*d)\*i\*Log[-((b\*c - a\*d)/(d\*(a + b\*x)))]\*Log[(e\*(a + b\*x))/(c + d\*x)]^2)/(b^2\*g) - (B^2\*(b\*c - a\*d)\*i\*Log[a + b\*x]\*Log[(e\*(a + b\*x))/(c + d\*x)]^2)/(b^2\*g) + (2\*a\*B\*d\*i\*Log[a + b\*x]\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(b^2\*g) + (d\*i\*x\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]^2)/(b\*g) + ((b\*c - a\*d)\*i\*Log[a + b\*x]\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]^2)/(b^2\*g) + (2\*B^2\*c\*i\*Log[-((d\*(a + b\*x))/(b\*c - a\*d))]\*Log[c + d\*x])/(b\*g) - (2\*B\*c\*i\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]\*Log[c + d\*x])/(b\*g) - (B^2\*c\*i\*Log[c + d\*x]^2)/(b\*g) + (2\*a\*B^2\*d\*i\*Log[a + b\*x]\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]))/(b^2\*g) + (2\*A\*B\*(b\*c - a\*d)\*i\*Log[a + b\*x]\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]))/(b^2\*g) + (2\*a\*B^2\*d\*i\*PolyLog[2, -((d\*(a + b\*x))/(b\*c - a\*d))])

$$\frac{1}{(b^2g)} + \frac{(2AB(b^2c - a^2d) \operatorname{PolyLog}[2, -\frac{d(a+bx)}{b^2c - a^2d}])}{(b^2g)} + \frac{(2B^2c \operatorname{PolyLog}[2, \frac{b(c+dx)}{b^2c - a^2d}])}{(b^2g)} + \frac{(2B^2(b^2c - a^2d) \operatorname{Log}[\frac{e(a+bx)}{c+dx}] \operatorname{PolyLog}[2, 1 + \frac{b^2c - a^2d}{d(a+bx)}])}{(b^2g)} + \frac{(2B^2(b^2c - a^2d) \operatorname{PolyLog}[3, 1 + \frac{b^2c - a^2d}{d(a+bx)}])}{(b^2g)}$$
Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]
] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] := Simp[x*(a +
b*Log[c*RFx^p])^n, x] - Dist[b^n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_.)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_.)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b^n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[(f*x)/d]^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
```

qQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] := Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] := -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rule 6688

Int[u\_, x\_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifierIntegrandQ[v, u, x]]

### Rule 6742

Int[u\_, x\_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]

### Rule 2411

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]\*(b\_.))^(p\_.)\*((f\_.) + (g\_.)\*(x\_)^(q\_.))\*((h\_.) + (i\_.)\*(x\_)^(r\_.)), x\_Symbol] := Dist[1/e, Subst[Int[(g\*x)/e]^q\*((e\*h - d\*i)/e + (i\*x)/e)^r\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e\*f - d\*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2\*r]

Rule 2344

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/((x\_)\*((d\_) + (e\_.)\*(x\_))), x\_Symbol] := Dist[1/d, Int[(a + b\*Log[c\*x^n])^p/x, x], x] - Dist[e/d, Int[(a + b\*Log[c\*x^n])^p/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

Rule 2317

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/((d\_) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^p)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

Rule 2507

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.)\*Log[(i\_.)\*((j\_.)\*((g\_.) + (h\_.)\*(x\_))^(t\_.))^(u\_.)]\*(v\_), x\_Symbol] := With[{k = Simplify[v\*(a + b\*x)\*(c + d\*x)]}, Simp[(k\*Log[i\*(j\*(g + h\*x)^t]^u)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s + 1))/(p\*r\*(s + 1)\*(b\*c - a\*d)), x] - Dist[(k\*h\*t\*u)/(p\*r\*(s + 1)\*(b\*c - a\*d)), Int[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s + 1)/(g + h\*x), x], x] /; FreeQ[k, x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && NeQ[s, -1]

Rule 2488

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.)/((g\_.) + (h\_.)\*(x\_)), x\_Symbol] := -Simp[(Log[-(b\*c - a\*d)/(d\*(a + b\*x))]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/h, x] + Dist[(p\*r\*s\*(b\*c - a\*d))/h, Int[(Log[-(b\*c - a\*d)/(d\*(a + b\*x))]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1))/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && EqQ[b\*g - a\*h, 0] && IGtQ[s, 0]

Rule 2506

Int[Log[v\_]\*Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.)\*(u\_), x\_Symbol] := With[{g = Simplify[((v - 1)\*(c + d\*x))/(a + b\*x)], h = Simplify[u\*(a + b\*x)\*(c + d\*x)]}, -Simp[(h\*PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/(b\*c - a\*d), x] + Dist[h\*p\*r\*s, Int[(PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1))/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,  
x]}, Simp[w*PolyLog[n + 1, v], x] /; !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{(59c + 59dx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{ag + bgx} dx &= \int \left( \frac{59d \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{bg} + \frac{59(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{bg(a + bx)} \right) dx \\
&= \frac{(59d) \int \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{bg} + \frac{(59(bc - ad)) \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{a+bx} dx}{bg} \\
&= \frac{59dx \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{bg} + \frac{59(bc - ad) \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g} \\
&= \frac{59dx \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{bg} + \frac{59(bc - ad) \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g} \\
&= \frac{59dx \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{bg} + \frac{59(bc - ad) \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g} \\
&= \frac{59dx \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{bg} + \frac{59(bc - ad) \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g} \\
&= \frac{118aBd \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2g} + \frac{59dx \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{bg} + \\
&= \frac{118aBd \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2g} + \frac{59dx \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{bg} + \\
&= -\frac{59B^2(bc - ad) \log(a + bx) \log^2 \left( \frac{e(a+bx)}{c+dx} \right)}{b^2g} + \frac{118aBd \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2g} \\
&= -\frac{59B^2(bc - ad) \log \left( -\frac{bc-ad}{d(a+bx)} \right) \log^2 \left( \frac{e(a+bx)}{c+dx} \right)}{b^2g} - \frac{59B^2(bc - ad) \log(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^2g} \\
&= -\frac{59AB(bc - ad) \log^2(a + bx)}{b^2g} - \frac{59B^2(bc - ad) \log \left( -\frac{bc-ad}{d(a+bx)} \right) \log^2 \left( \frac{e(a+bx)}{c+dx} \right)}{b^2g} \\
&= -\frac{59aB^2d \log^2(a + bx)}{b^2g} - \frac{59AB(bc - ad) \log^2(a + bx)}{b^2g} - \frac{59B^2(bc - ad) \log \left( -\frac{bc-ad}{d(a+bx)} \right) \log^2 \left( \frac{e(a+bx)}{c+dx} \right)}{b^2g} \\
&= -\frac{59aB^2d \log^2(a + bx)}{b^2g} - \frac{59AB(bc - ad) \log^2(a + bx)}{b^2g} - \frac{59B^2(bc - ad) \log \left( -\frac{bc-ad}{d(a+bx)} \right) \log^2 \left( \frac{e(a+bx)}{c+dx} \right)}{b^2g}
\end{aligned}$$

**Mathematica [B]** time = 1.31181, size = 987, normalized size = 3.45

$$i \left( 3bdx A^2 + 3(bc - ad) \log(a + bx) A^2 - 3B \left( ad \log^2 \left( \frac{a}{b} + x \right) - 2ad(\log(a + bx) + 1) \log \left( \frac{a}{b} + x \right) + 2 \left( -bc + ad + \log \left( \frac{c}{d} + x \right) \right) \right) \right)$$

Antiderivative was successfully verified.

[In] Integrate[(((c\*i + d\*i\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))^2)/(a\*g + b\*g\*x), x]

[Out] (i\*(3\*A^2\*b\*d\*x + 3\*A^2\*(b\*c - a\*d)\*Log[a + b\*x] - 3\*A\*B\*(a\*d\*Log[a/b + x]^2 - 2\*a\*d\*Log[a/b + x]\*(1 + Log[a + b\*x]) + 2\*(-(b\*c) + a\*d + Log[c/d + x]\*(b\*c + a\*d\*Log[a + b\*x] - a\*d\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)])) + (-(b\*d\*x) + a\*d\*Log[a + b\*x])\*Log[(e\*(a + b\*x))/(c + d\*x)] - 2\*a\*d\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)] + 3\*A\*b\*B\*c\*(Log[a/b + x]^2 - 2\*Log[a + b\*x]\*(Log[a/b + x] - Log[c/d + x] - Log[(e\*(a + b\*x))/(c + d\*x])) - 2\*(Log[c/d + x]\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)] + PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])) - B^2\*(a\*d\*Log[a/b + x]^3 - 3\*d\*(2\*b\*x - 2\*(a + b\*x)\*Log[a/b + x] + (a + b\*x)\*Log[a/b + x]^2) - 3\*b\*(2\*d\*x - 2\*(c + d\*x)\*Log[c/d + x] + (c + d\*x)\*Log[c/d + x]^2) - 3\*d\*(b\*x - a\*Log[a + b\*x])\*(-Log[a/b + x] + Log[c/d + x] + Log[(e\*(a + b\*x))/(c + d\*x)]^2 + 6\*(a\*d + 2\*b\*d\*x - b\*d\*x\*Log[c/d + x] - b\*c\*Log[c + d\*x] + Log[a/b + x]\*(-(d\*(a + b\*x)) + d\*(a + b\*x)\*Log[c/d + x] + (b\*c - a\*d)\*Log[(b\*(c + d\*x))/(b\*c - a\*d)])) + (b\*c - a\*d)\*PolyLog[2, (d\*(a + b\*x))/(-(b\*c) + a\*d)] - 3\*(Log[a/b + x] - Log[c/d + x] - Log[(e\*(a + b\*x))/(c + d\*x)])\*(-2\*b\*c + 2\*a\*d - 2\*d\*(a + b\*x)\*Log[a/b + x] + a\*d\*Log[a/b + x]^2 + 2\*Log[c/d + x]\*(b\*(c + d\*x) - a\*d\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)])) - 2\*a\*d\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)] - 3\*a\*d\*(Log[a/b + x]^2\*(Log[c/d + x] - Log[(b\*(c + d\*x))/(b\*c - a\*d)]) - 2\*Log[a/b + x]\*PolyLog[2, (d\*(a + b\*x))/(-(b\*c) + a\*d)] + 2\*PolyLog[3, (d\*(a + b\*x))/(-(b\*c) + a\*d)]) + 3\*a\*d\*(Log[c/d + x]^2\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)] + 2\*Log[c/d + x]\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)] - 2\*PolyLog[3, (b\*(c + d\*x))/(b\*c - a\*d)])) - 3\*b\*B^2\*c\*(Log[(-(b\*c) + a\*d)/(d\*(a + b\*x))]\*Log[(e\*(a + b\*x))/(c + d\*x)]^2 - 2\*Log[(e\*(a + b\*x))/(c + d\*x)]\*PolyLog[2, (b\*(c + d\*x))/(d\*(a + b\*x))]) - 2\*PolyLog[3, (b\*(c + d\*x))/(d\*(a + b\*x))]))/(3\*b^2\*g)

**Maple [F]** time = 2.77, size = 0, normalized size = 0.

$$\int \frac{dix + ci}{bgx + ag} \left( A + B \ln \left( \frac{e(bx + a)}{dx + c} \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.



[In] `int((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x)`

[Out] `int((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x)`

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$A^2 di \left( \frac{x}{bg} - \frac{a \log(bx+a)}{b^2 g} \right) + \frac{A^2 ci \log(bgx+ag)}{bg} + \frac{(B^2 bdix + (bci - adi)B^2 \log(bx+a)) \log(dx+c)^2}{b^2 g} - \int - \frac{B^2 b^2 c^2 i \log(bx+a)}{b^2 g} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x, algorithm="maxima")`

[Out] `A^2*d*i*(x/(b*g) - a*log(b*x + a)/(b^2*g)) + A^2*c*i*log(b*g*x + a*g)/(b*g) + (B^2*b*d*i*x + (b*c*i - a*d*i)*B^2*log(b*x + a))*log(d*x + c)^2/(b^2*g) - integrate(-(B^2*b^2*c^2*i*log(e)^2 + 2*A*B*b^2*c^2*i*log(e) + (B^2*b^2*d^2*i*log(e)^2 + 2*A*B*b^2*d^2*i*log(e)))*x^2 + (B^2*b^2*d^2*i*x^2 + 2*B^2*b^2*c*d*i*x + B^2*b^2*c^2*i)*log(b*x + a)^2 + 2*(B^2*b^2*c*d*i*log(e)^2 + 2*A*B*b^2*c*d*i*log(e))*x + 2*(B^2*b^2*c^2*i*log(e) + A*B*b^2*c^2*i + (B^2*b^2*d^2*i*log(e) + A*B*b^2*d^2*i))*x^2 + 2*(B^2*b^2*c*d*i*log(e) + A*B*b^2*c*d*i)*x)*log(b*x + a) - 2*(B^2*b^2*c^2*i*log(e) + A*B*b^2*c^2*i + ((i*log(e) + i)*B^2*b^2*d^2 + A*B*b^2*d^2*i))*x^2 + (2*A*B*b^2*c*d*i + (2*b^2*c*d*i*log(e) + a*b*d^2*i)*B^2)*x + (B^2*b^2*d^2*i*x^2 + (3*b^2*c*d*i - a*b*d^2*i)*B^2*x + (b^2*c^2*i + a*b*c*d*i - a^2*d^2*i)*B^2)*log(b*x + a))*log(d*x + c))/(b^3*d*g*x^2 + a*b^2*c*g + (b^3*c*g + a*b^2*d*g)*x), x)`

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{A^2 dix + A^2 ci + (B^2 dix + B^2 ci) \log\left(\frac{bex+ae}{dx+c}\right)^2 + 2(ABdix + ABci) \log\left(\frac{bex+ae}{dx+c}\right)}{bgx + ag}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x, algorithm="fricas")`

```
[Out] integral((A^2*d*i*x + A^2*c*i + (B^2*d*i*x + B^2*c*i)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*d*i*x + A*B*c*i)*log((b*e*x + a*e)/(d*x + c)))/(b*g*x + a*g), x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g), x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci) \left( B \log \left( \frac{(bx+a)e}{dx+c} \right) + A \right)^2}{bgx + ag} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g), x, algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g), x)
```

$$3.60 \quad \int \frac{(ci+dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^2} dx$$

**Optimal.** Leaf size=241

$$\frac{2Bdi\text{PolyLog}\left(2, \frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{b^2g^2} + \frac{2B^2di\text{PolyLog}\left(3, \frac{b(c+dx)}{d(a+bx)}\right)}{b^2g^2} - \frac{di\log\left(1 - \frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{b^2g^2}$$

[Out]  $(-2*B^2*i*(c + d*x))/(b*g^2*(a + b*x)) - (2*B*i*(c + d*x)*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(b*g^2*(a + b*x)) - (i*(c + d*x)*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])^2)/(b*g^2*(a + b*x)) - (d*i*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])^2*\text{Log}[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^2*g^2) + (2*B*d*i*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])*\text{PolyLog}[2, (b*(c + d*x))/(d*(a + b*x))])/(b^2*g^2) + (2*B^2*d*i*\text{PolyLog}[3, (b*(c + d*x))/(d*(a + b*x))])/(b^2*g^2)$

**Rubi [B]** time = 3.02775, antiderivative size = 705, normalized size of antiderivative = 2.93, number of steps used = 43, number of rules used = 20, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.5$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610}

$$\frac{2ABdi\text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{b^2g^2} + \frac{2B^2di\text{PolyLog}\left(2, \frac{bc-ad}{d(a+bx)} + 1\right)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^2g^2} - \frac{2B^2di\text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{b^2g^2} - \frac{2B^2di\text{PolyLog}\left(3, \frac{bc-ad}{d(a+bx)} + 1\right)}{b^2g^2}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[(c*i + d*i*x)*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])^2/(a*g + b*g*x)^2, x]$

[Out]  $(-2*B^2*(b*c - a*d)*i)/(b^2*g^2*(a + b*x)) - (2*B^2*d*i*\text{Log}[a + b*x])/(b^2*g^2) - (A*B*d*i*\text{Log}[a + b*x]^2)/(b^2*g^2) + (B^2*d*i*\text{Log}[a + b*x]^2)/(b^2*g^2) - (B^2*d*i*\text{Log}[-((b*c - a*d)/(d*(a + b*x))])*\text{Log}[(e*(a + b*x))/(c + d*x)])^2/(b^2*g^2) - (B^2*d*i*\text{Log}[a + b*x]*\text{Log}[(e*(a + b*x))/(c + d*x)]^2)/(b^2*g^2) - (2*B*(b*c - a*d)*i*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(b^2*g^2*(a + b*x)) - (2*B*d*i*\text{Log}[a + b*x]*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(b^2*g^2) - ((b*c - a*d)*i*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])^2)/(b^2*g^2*(a + b*x)) + (d*i*\text{Log}[a + b*x]*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])^2)/(b^2*g^2) + (2*B^2*d*i*\text{Log}[c + d*x])/(b^2*g^2) - (2*B^2*d*i*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/(b^2*g^2) + (2*B*d*i*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])*\text{Log}[c + d*x])/(b^2*g^2) + (B^2*d*i*\text{Log}[c + d*x]^2)/(b^2*g^2) + ($

$$2ABd \log[a + bx] \log\left[\frac{b(c + dx)}{b^2c - a^2d}\right] / (b^2g^2) - (2B^2d \log[a + bx] \log\left[\frac{b(c + dx)}{b^2c - a^2d}\right]) / (b^2g^2) + (2ABd \text{PolyLog}[2, -((d(a + bx))/(b^2c - a^2d))]) / (b^2g^2) - (2B^2d \text{PolyLog}[2, -((d(a + bx))/(b^2c - a^2d))]) / (b^2g^2) - (2B^2d \text{PolyLog}[2, (b(c + dx))/(b^2c - a^2d)]) / (b^2g^2) + (2B^2d \log[(e(a + bx))/(c + dx)] \text{PolyLog}[2, 1 + (b^2c - a^2d)/(d(a + bx))]) / (b^2g^2) + (2B^2d \text{PolyLog}[3, 1 + (b^2c - a^2d)/(d(a + bx))]) / (b^2g^2)$$
Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*RFX^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]
] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFX, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[
((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[
((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFX^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :=> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n]]^p, RFx, x]},
Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :=> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :=> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :=> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e^n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))])*(b_.)/((f_.) + (g_.)*(x_)), x_
Symbol] :=> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :=> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rule 6688

```
Int[u_, x_Symbol] :=> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]
```

### Rule 6742

```
Int[u_, x_Symbol] :=> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

Int[((a\_.) + Log[(c\_.)\*(d\_.) + (e\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)\*((f\_.) + (g\_.)\*(x\_)^(q\_.))\*((h\_.) + (i\_.)\*(x\_)^(r\_.), x\_Symbol] := Dist[1/e, Subst[Int[((g\*x)/e)^q\*((e\*h - d\*i)/e + (i\*x)/e)^r\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e\*f - d\*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2\*r]

Rule 2344

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/((x\_)\*((d\_.) + (e\_.)\*(x\_))), x\_Symbol] := Dist[1/d, Int[(a + b\*Log[c\*x^n])^p/x, x], x] - Dist[e/d, Int[(a + b\*Log[c\*x^n])^p/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

Rule 2317

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^p)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

Rule 2507

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_)^(p\_.))\*((c\_.) + (d\_.)\*(x\_)^(q\_.))^(r\_.)]^(s\_.)\*Log[(i\_.)\*((j\_.)\*((g\_.) + (h\_.)\*(x\_)^(t\_.))^(u\_.))\*((v\_.)), x\_Symbol] := With[{k = Simplify[v\*(a + b\*x)\*(c + d\*x)]}, Simp[(k\*Log[i\*(j\*(g + h\*x)^t]^u)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s + 1))/(p\*r\*(s + 1)\*(b\*c - a\*d)), x] - Dist[(k\*h\*t\*u)/(p\*r\*(s + 1)\*(b\*c - a\*d)), Int[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s + 1)/(g + h\*x), x], x] /; FreeQ[k, x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && NeQ[s, -1]

Rule 2488

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_)^(p\_.))\*((c\_.) + (d\_.)\*(x\_)^(q\_.))^(r\_.)]^(s\_.)/((g\_.) + (h\_.)\*(x\_)), x\_Symbol] := -Simp[(Log[-((b\*c - a\*d)/(d\*(a + b\*x)))]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/h, x] + Dist[(p\*r\*s\*(b\*c - a\*d))/h, Int[(Log[-((b\*c - a\*d)/(d\*(a + b\*x)))]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1))/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && EqQ[b\*g - a\*h, 0] && IGtQ[s, 0]

Rule 2506

```

Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] := With[{g = Simplify[((v - 1)*(c + d*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/(b*c - a*d), x] + Dist[h*p*r*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]

```

Rule 6610

```

Int[(u_)*PolyLog[n_, v_], x_Symbol] := With[{w = DerivativeDivides[v, u*v, x]}, Simp[w*PolyLog[n + 1, v], x] /; !FalseQ[w] /; FreeQ[n, x]

```

Rubi steps

$$\begin{aligned}
\int \frac{(60c + 60dx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(ag + bgx)^2} dx &= \int \left( \frac{60(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{bg^2(a + bx)^2} + \frac{60d \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{bg^2(a + bx)} \right) dx \\
&= \frac{(60d) \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{a+bx} dx}{bg^2} + \frac{(60(bc - ad)) \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(a+bx)^2} dx}{bg^2} \\
&= -\frac{60(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g^2(a + bx)} + \frac{60d \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g^2} \\
&= -\frac{60(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g^2(a + bx)} + \frac{60d \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g^2} \\
&= -\frac{60(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g^2(a + bx)} + \frac{60d \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g^2} \\
&= -\frac{60(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g^2(a + bx)} + \frac{60d \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g^2} \\
&= -\frac{120B(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2g^2(a + bx)} - \frac{120Bd \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2g^2} \\
&= -\frac{120B(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2g^2(a + bx)} - \frac{120Bd \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2g^2} \\
&= -\frac{60B^2d \log(a + bx) \log^2 \left( \frac{e(a+bx)}{c+dx} \right)}{b^2g^2} - \frac{120B(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2g^2(a + bx)} - \frac{120Bd \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2g^2} \\
&= -\frac{120B^2(bc - ad)}{b^2g^2(a + bx)} - \frac{120B^2d \log(a + bx)}{b^2g^2} - \frac{60B^2d \log \left( -\frac{bc-ad}{d(a+bx)} \right) \log^2 \left( \frac{e(a+bx)}{c+dx} \right)}{b^2g^2} \\
&= -\frac{120B^2(bc - ad)}{b^2g^2(a + bx)} - \frac{120B^2d \log(a + bx)}{b^2g^2} - \frac{60ABd \log^2(a + bx)}{b^2g^2} - \frac{60B^2d \log(a + bx)}{b^2g^2} \\
&= -\frac{120B^2(bc - ad)}{b^2g^2(a + bx)} - \frac{120B^2d \log(a + bx)}{b^2g^2} - \frac{60ABd \log^2(a + bx)}{b^2g^2} + \frac{60B^2d \log^2(a + bx)}{b^2g^2} \\
&= -\frac{120B^2(bc - ad)}{b^2g^2(a + bx)} - \frac{120B^2d \log(a + bx)}{b^2g^2} - \frac{60ABd \log^2(a + bx)}{b^2g^2} + \frac{60B^2d \log^2(a + bx)}{b^2g^2}
\end{aligned}$$



**Mathematica [B]** time = 2.46368, size = 1407, normalized size = 5.84

result too large to display

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2)/(a\*g + b\*g\*x)^2,x]

[Out] (i\*((3\*A^2\*(-(b\*c) + a\*d))/(a + b\*x) + 3\*A^2\*d\*Log[a + b\*x] - (6\*A\*b\*B\*c\*(-(d\*(a + b\*x)\*Log[c/d + x]) + d\*(a + b\*x)\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)] + (b\*c - a\*d)\*(1 + Log[(e\*(a + b\*x))/(c + d\*x)])))/((b\*c - a\*d)\*(a + b\*x)) + (3\*b\*B^2\*c\*(-2\*b\*c + 2\*a\*d - 2\*d\*(a + b\*x)\*Log[a + b\*x] - 2\*(b\*c - a\*d)\*Log[(e\*(a + b\*x))/(c + d\*x)] - 2\*d\*(a + b\*x)\*Log[a + b\*x]\*Log[(e\*(a + b\*x))/(c + d\*x)] - (b\*c - a\*d)\*Log[(e\*(a + b\*x))/(c + d\*x)]^2 + 2\*d\*(a + b\*x)\*Log[c + d\*x] - 2\*d\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x)]\*Log[(b\*c - a\*d)/(b\*c + b\*d\*x)] + d\*(a + b\*x)\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]) - 2\*PolyLog[2, (d\*(a + b\*x))/(-(b\*c) + a\*d)] + d\*(a + b\*x)\*(Log[(b\*c - a\*d)/(b\*c + b\*d\*x)]\*(2\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)] + Log[(b\*c - a\*d)/(b\*c + b\*d\*x)] - 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])))/((b\*c - a\*d)\*(a + b\*x)) + 3\*A\*B\*d\*(Log[a/b + x]^2 - 2\*Log[a/b + x]\*Log[a + b\*x] - 2\*Log[c/d + x]\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)] + 2\*Log[a + b\*x]\*((a\*d)/(b\*c - a\*d) + Log[c/d + x] + Log[(e\*(a + b\*x))/(c + d\*x)]) + 2\*a\*((a + b\*x)^(-1) + Log[(e\*(a + b\*x))/(c + d\*x)]/(a + b\*x) + (d\*Log[c + d\*x])/(-(b\*c) + a\*d)) - 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)] + (B^2\*d\*((b\*c - a\*d)\*(a + b\*x)\*Log[a/b + x]^3 + 3\*a\*(b\*c - a\*d)\*(2 + 2\*Log[a/b + x] + Log[a/b + x]^2) + 3\*(b\*c - a\*d)\*(a + (a + b\*x)\*Log[a + b\*x])\*(-Log[a/b + x] + Log[c/d + x] + Log[(e\*(a + b\*x))/(c + d\*x)])^2 + 3\*a\*(d\*(a + b\*x)\*Log[a/b + x]^2 + 2\*((-(b\*c) + a\*d)\*Log[c/d + x] + d\*(a + b\*x)\*(Log[a + b\*x] - Log[c + d\*x])) - 2\*Log[a/b + x]\*((b\*c - a\*d)\*Log[c/d + x] + d\*(a + b\*x)\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]) - 2\*d\*(a + b\*x)\*PolyLog[2, (d\*(a + b\*x))/(-(b\*c) + a\*d)] + 3\*a\*(Log[c/d + x]\*(b\*(c + d\*x)\*Log[c/d + x] - 2\*d\*(a + b\*x)\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)]) - 2\*d\*(a + b\*x)\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)] - 3\*(Log[a/b + x] - Log[c/d + x] - Log[(e\*(a + b\*x))/(c + d\*x)])\*((b\*c - a\*d)\*(a + b\*x)\*Log[a/b + x]^2 + 2\*a\*(b\*c - a\*d)\*(1 + Log[a/b + x]) + 2\*a\*(-(b\*c) + a\*d)\*Log[c/d + x] + 2\*a\*d\*(a + b\*x)\*(Log[a + b\*x] - Log[c + d\*x]) - 2\*(b\*c - a\*d)\*(a + b\*x)\*(Log[c/d + x]\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)] + PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])) - 3\*(b\*c - a\*d)\*(a + b\*x)\*(Log[a/b + x]^2\*(Log[c/d + x] - Log[(b\*(c + d\*x))/(b\*c - a\*d)]) - 2\*Log[a/b + x]\*PolyLog[2, (d\*(a + b\*x))/(-(b\*c) + a\*d)] + 2\*PolyLog[3, (d\*(a + b\*x))/(-(b\*c) + a\*d)] + 3\*(b\*c - a\*d)\*(a + b\*x)\*(Log[c/d + x]^2\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)] + 2\*Log[c/d + x]\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)] - 2\*PolyLog[3, (b\*(c + d\*x))/(b\*c - a\*d)])))/((b\*c - a\*d)\*(a + b\*x)))/(3\*b^2\*g^2)

---

**Maple [F]** time = 3.008, size = 0, normalized size = 0.

$$\int \frac{dix + ci}{(bgx + ag)^2} \left( A + B \ln \left( \frac{e(bx + a)}{dx + c} \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*i\*x+c\*i)\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^2,x)

[Out] int((d\*i\*x+c\*i)\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^2,x)

---

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$A^2 di \left( \frac{a}{b^3 g^2 x + ab^2 g^2} + \frac{\log(bx + a)}{b^2 g^2} \right) - 2 ABci \left( \frac{\log\left(\frac{bex}{dx+c} + \frac{ae}{dx+c}\right)}{b^2 g^2 x + abg^2} + \frac{1}{b^2 g^2 x + abg^2} + \frac{d \log(bx + a)}{(b^2 c - abd)g^2} - \frac{d \log(dx + c)}{(b^2 c - abd)g^2} \right) - \frac{1}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^2,x, algorith="maxima")

[Out] A^2\*d\*i\*(a/(b^3\*g^2\*x + a\*b^2\*g^2) + log(b\*x + a)/(b^2\*g^2)) - 2\*A\*B\*c\*i\*(1  
og(b\*e\*x/(d\*x + c) + a\*e/(d\*x + c))/(b^2\*g^2\*x + a\*b\*g^2) + 1/(b^2\*g^2\*x +  
a\*b\*g^2) + d\*log(b\*x + a)/((b^2\*c - a\*b\*d)\*g^2) - d\*log(d\*x + c)/((b^2\*c -  
a\*b\*d)\*g^2)) - A^2\*c\*i/(b^2\*g^2\*x + a\*b\*g^2) - ((b\*c\*i - a\*d\*i)\*B^2 - (B^2\*  
b\*d\*i\*x + B^2\*a\*d\*i)\*log(b\*x + a))\*log(d\*x + c)^2/(b^3\*g^2\*x + a\*b^2\*g^2) -  
integrate(-(B^2\*b^2\*c^2\*i\*log(e)^2 + (B^2\*b^2\*d^2\*i\*log(e)^2 + 2\*A\*B\*b^2\*d  
^2\*i\*log(e))\*x^2 + (B^2\*b^2\*d^2\*i\*x^2 + 2\*B^2\*b^2\*c\*d\*i\*x + B^2\*b^2\*c^2\*i)\*  
log(b\*x + a)^2 + 2\*(B^2\*b^2\*c\*d\*i\*log(e)^2 + A\*B\*b^2\*c\*d\*i\*log(e))\*x + 2\*(B  
^2\*b^2\*c^2\*i\*log(e) + (B^2\*b^2\*d^2\*i\*log(e) + A\*B\*b^2\*d^2\*i)\*x^2 + (2\*B^2\*b  
^2\*c\*d\*i\*log(e) + A\*B\*b^2\*c\*d\*i)\*x)\*log(b\*x + a) - 2\*((b^2\*c^2\*i\*log(e) - a  
\*b\*c\*d\*i + a^2\*d^2\*i)\*B^2 + (B^2\*b^2\*d^2\*i\*log(e) + A\*B\*b^2\*d^2\*i)\*x^2 + (A  
\*B\*b^2\*c\*d\*i + ((2\*i\*log(e) - i)\*b^2\*c\*d + a\*b\*d^2\*i)\*B^2)\*x + (2\*B^2\*b^2\*d  
^2\*i\*x^2 + 2\*(b^2\*c\*d\*i + a\*b\*d^2\*i)\*B^2\*x + (b^2\*c^2\*i + a^2\*d^2\*i)\*B^2)\*1  
og(b\*x + a))\*log(d\*x + c))/(b^4\*d\*g^2\*x^3 + a^2\*b^2\*c\*g^2 + (b^4\*c\*g^2 + 2\*  
a\*b^3\*d\*g^2)\*x^2 + (2\*a\*b^3\*c\*g^2 + a^2\*b^2\*d\*g^2)\*x), x)

---

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{A^2 dx + A^2 ci + (B^2 dx + B^2 ci) \log\left(\frac{bex+ae}{dx+c}\right)^2 + 2(ABdx + ABci) \log\left(\frac{bex+ae}{dx+c}\right)}{b^2 g^2 x^2 + 2 abg^2 x + a^2 g^2}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^2,x, algorithm="fricas")

[Out] integral((A^2\*d\*i\*x + A^2\*c\*i + (B^2\*d\*i\*x + B^2\*c\*i)\*log((b\*e\*x + a\*e)/(d\*x + c))^2 + 2\*(A\*B\*d\*i\*x + A\*B\*c\*i)\*log((b\*e\*x + a\*e)/(d\*x + c)))/(b^2\*g^2\*x^2 + 2\*a\*b\*g^2\*x + a^2\*g^2), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c))))\*\*2/(b\*g\*x+a\*g)\*\*2,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci) \left( B \log\left(\frac{(bx+ae)}{dx+c}\right) + A \right)^2}{(bgx + ag)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^2,x, algorithm="giac")

[Out] integrate((d\*i\*x + c\*i)\*(B\*log((b\*x + a)\*e/(d\*x + c)) + A)^2/(b\*g\*x + a\*g)^2, x)

$$3.61 \quad \int \frac{(ci+dx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^3} dx$$

**Optimal.** Leaf size=141

$$\frac{i(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2g^3(a+bx)^2(bc-ad)} - \frac{Bi(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g^3(a+bx)^2(bc-ad)} - \frac{B^2i(c+dx)^2}{4g^3(a+bx)^2(bc-ad)}$$

[Out]  $-(B^2i*(c+dx)^2)/(4*(b*c-a*d)*g^3*(a+bx)^2) - (B*i*(c+dx)^2*(A+B*Log[(e*(a+bx))/(c+dx)]))/(2*(b*c-a*d)*g^3*(a+bx)^2) - (i*(c+dx)^2*(A+B*Log[(e*(a+bx))/(c+dx)])^2)/(2*(b*c-a*d)*g^3*(a+bx)^2)$

**Rubi [C]** time = 1.94, antiderivative size = 639, normalized size of antiderivative = 4.53, number of steps used = 58, number of rules used = 11, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.275$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2d^2i\text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{b^2g^3(bc-ad)} - \frac{B^2d^2i\text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{b^2g^3(bc-ad)} - \frac{Bd^2i\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^2g^3(bc-ad)} + \frac{Bd^2i\log(c+dx)}{b^2g^3(bc-ad)}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[\frac{((c*i+d*i*x)*(A+B*Log[(e*(a+bx))/(c+dx)]))^2}{(a*g+b*g*x)^3}, x]$

[Out]  $-(B^2*(b*c-a*d)*i)/(4*b^2*g^3*(a+bx)^2) - (B^2*d*i)/(2*b^2*g^3*(a+bx)^2) - (B^2*d^2*i*Log[a+bx])/(2*b^2*(b*c-a*d)*g^3) + (B^2*d^2*i*Log[a+bx]^2)/(2*b^2*(b*c-a*d)*g^3) - (B*(b*c-a*d)*i*(A+B*Log[(e*(a+bx))/(c+dx)]))/(2*b^2*g^3*(a+bx)^2) - (B*d*i*(A+B*Log[(e*(a+bx))/(c+dx)]))/(b^2*g^3*(a+bx)) - (B*d^2*i*Log[a+bx]*(A+B*Log[(e*(a+bx))/(c+dx)]))/(b^2*(b*c-a*d)*g^3) - ((b*c-a*d)*i*(A+B*Log[(e*(a+bx))/(c+dx)]))^2/(2*b^2*g^3*(a+bx)^2) - (d*i*(A+B*Log[(e*(a+bx))/(c+dx)]))^2/(b^2*g^3*(a+bx)) + (B^2*d^2*i*Log[c+dx])/(2*b^2*(b*c-a*d)*g^3) - (B^2*d^2*i*Log[-((d*(a+bx))/(b*c-a*d))]*Log[c+dx])/(b^2*(b*c-a*d)*g^3) + (B*d^2*i*(A+B*Log[(e*(a+bx))/(c+dx)])*Log[c+dx])/(b^2*(b*c-a*d)*g^3) + (B^2*d^2*i*Log[c+dx]^2)/(2*b^2*(b*c-a*d)*g^3) - (B^2*d^2*i*Log[a+bx]*Log[(b*(c+dx))/(b*c-a*d)])/(b^2*(b*c-a*d)*g^3) - (B^2*d^2*i*PolyLog[2, -((d*(a+bx))/(b*c-a*d))])/(b^2*(b*c-a*d)*g^3) - (B^2*d^2*i*PolyLog[2, (b*(c+dx))/(b*c-a*d)])/(b^2*(b*c-a*d)*g^3)$

\*c - a\*d)\*g^3)

### Rule 2528

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*(RGx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

### Rule 2525

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*((d\_.) + (e\_.)\*(x\_))^(m\_.), x\_Symbol] := Simp[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^n)/(e\*(m + 1)), x] - Dist[(b\*n\*p)/(e\*(m + 1)), Int[SimplifyIntegrand[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

### Rule 12

Int[(a\_)\*(u\_), x\_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b\_)\*(v\_)] /; FreeQ[b, x]

### Rule 44

Int[((a\_) + (b\_.)\*(x\_))^(m\_.)\*((c\_.) + (d\_.)\*(x\_))^(n\_.), x\_Symbol] := Int[ExpandIntegrand[(a + b\*x)^m\*(c + d\*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b\*c - a\*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])

### Rule 2524

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^n)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

### Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*(RFx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x
), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}
\int \frac{(61c + 61dx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(ag + bgx)^3} dx &= \int \left( \frac{61(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{bg^3(a + bx)^3} + \frac{61d \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{bg^3(a + bx)^2} \right) dx \\
&= \frac{(61d) \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(a+bx)^2} dx}{bg^3} + \frac{(61(bc - ad)) \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(a+bx)^3} dx}{bg^3} \\
&= -\frac{61(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{2b^2g^3(a + bx)^2} - \frac{61d \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g^3(a + bx)} + \frac{(122Bd)}{2b^2g^3(a + bx)} \\
&= -\frac{61(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{2b^2g^3(a + bx)^2} - \frac{61d \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g^3(a + bx)} + \frac{(122Bd)}{2b^2g^3(a + bx)} \\
&= -\frac{61(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{2b^2g^3(a + bx)^2} - \frac{61d \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g^3(a + bx)} + \frac{(122Bd)}{2b^2g^3(a + bx)} \\
&= -\frac{61(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{2b^2g^3(a + bx)^2} - \frac{61d \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g^3(a + bx)} - \frac{(61Bd)}{2b^2g^3(a + bx)} \\
&= -\frac{61B(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{2b^2g^3(a + bx)^2} - \frac{61Bd \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2g^3(a + bx)} - \frac{61Bd^2}{2b^2g^3(a + bx)} \\
&= -\frac{61B(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{2b^2g^3(a + bx)^2} - \frac{61Bd \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2g^3(a + bx)} - \frac{61Bd^2}{2b^2g^3(a + bx)} \\
&= -\frac{61B^2(bc - ad)}{4b^2g^3(a + bx)^2} - \frac{61B^2d}{2b^2g^3(a + bx)} - \frac{61B^2d^2 \log(a + bx)}{2b^2(bc - ad)g^3} - \frac{61B(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{2b^2g^3(a + bx)} \\
&= -\frac{61B^2(bc - ad)}{4b^2g^3(a + bx)^2} - \frac{61B^2d}{2b^2g^3(a + bx)} - \frac{61B^2d^2 \log(a + bx)}{2b^2(bc - ad)g^3} - \frac{61B(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{2b^2g^3(a + bx)} \\
&= -\frac{61B^2(bc - ad)}{4b^2g^3(a + bx)^2} - \frac{61B^2d}{2b^2g^3(a + bx)} - \frac{61B^2d^2 \log(a + bx)}{2b^2(bc - ad)g^3} + \frac{61B^2d^2 \log^2(a + bx)}{2b^2(bc - ad)g^3} \\
&= -\frac{61B^2(bc - ad)}{4b^2g^3(a + bx)^2} - \frac{61B^2d}{2b^2g^3(a + bx)} - \frac{61B^2d^2 \log(a + bx)}{2b^2(bc - ad)g^3} + \frac{61B^2d^2 \log^2(a + bx)}{2b^2(bc - ad)g^3}
\end{aligned}$$

**Mathematica [C]** time = 0.930415, size = 765, normalized size = 5.43

$$i \left( B \left( 2Bd^2(a+bx)^2 \left( \log(a+bx) \left( \log(a+bx) - 2 \log\left(\frac{b(c+dx)}{bc-ad}\right) \right) - 2 \text{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) \right) - 2Bd^2(a+bx)^2 \left( 2 \text{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) \right) \right)$$

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2)/(a\*g + b\*g\*x)^3,x]

[Out] 
$$\begin{aligned} & -(i*(2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - 4*d*(-(b*c) + a*d)*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 4*B*d*(a + b*x)*(2 \\ & *(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*d*(a + b*x)*Log[a + b*x] \\ & *(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 2*d*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) \\ & *Log[c + d*x] + 2*B*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) \\ & - B*d*(a + b*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) \\ & - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + B*d*(a + b*x)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] \\ & - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + B*(2*(b*c - a*d)^2 \\ & *(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 4*d*(-(b*c) + a*d)*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) \\ & - 4*d^2*(a + b*x)^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 4*d^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) \\ & *Log[c + d*x] - 4*B*d*(a + b*x)*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) \\ & + B*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) \\ & + 2*B*d^2*(a + b*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) \\ & - 2*B*d^2*(a + b*x)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) \\ & )/(4*b^2*(b*c - a*d)*g^3*(a + b*x)^2) \end{aligned}$$

**Maple [B]** time = 0.053, size = 865, normalized size = 6.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*i\*x+c\*i)\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^3,x)

[Out] 
$$\frac{1}{2}e^{2d*i}/(a*d-b*c)^2/g^3A^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^{2a-1/2}e^{2*i}/(a*d-b*c)^2/g^3A^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^{2b*c+e^2*d*$$



$$\frac{i}{(a*d-b*c)^2/g^3*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-e^2*i/(a*d-b*c)^2/g^3*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+1/2*e^2*d*i/(a*d-b*c)^2/g^3*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a-1/2*e^2*i/(a*d-b*c)^2/g^3*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*b*c+1/2*e^2*d*i/(a*d-b*c)^2/g^3*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a-1/2*e^2*i/(a*d-b*c)^2/g^3*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a-1/2*e^2*i/(a*d-b*c)^2/g^3*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-1/2*e^2*i/(a*d-b*c)^2/g^3*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+1/4*e^2*d*i/(a*d-b*c)^2/g^3*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a-1/4*e^2*i/(a*d-b*c)^2/g^3*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*b*c$$


---

**Maxima [B]** time = 1.76029, size = 2682, normalized size = 19.02

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^3,x, algorithm="maxima")

[Out] 
$$\begin{aligned} & -1/2*(2*b*x + a)*B^2*d*i*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) + 1/4*(2*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + 2*d^2*log(b*x + a)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - (b^2*c^2 - 8*a*b*c*d + 7*a^2*d^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a)^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(d*x + c)^2 - 6*(b^2*c*d - a*b*d^2)*x - 6*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a) + 2*(3*b^2*d^2*x^2 + 6*a*b*d^2*x + 3*a^2*d^2 - 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a))*log(d*x + c))/(a^2*b^3*c^2*g^3 - 2*a^3*b^2*c*d*g^3 + a^4*b*d^2*g^3 + (b^5*c^2*g^3 - 2*a*b^4*c*d*g^3 + a^2*b^3*d^2*g^3)*x^2 + 2*(a*b^4*c^2*g^3 - 2*a^2*b^3*c*d*g^3 + a^3*b^2*d^2*g^3)*x))*B^2*c*i - 1/4*(2*((3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*d)*x)/((b^5*c - a*b^4*d)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)*g^3) + 2*(2*b*c*d - a*d^2)*log(b*x + a)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3) - 2*(2*b*c*d - a*d^2)*log(d*x + c)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + (7*a*b^2*c^2 - 8*a^2*b*c*d + a^3*d^2 - 2*(2*a^2*b*c*d - a^3*d^2 + (2*b^3*c*d - a*b^2*d^2)*x^2 + 2*(2*a*b^2*c*d - a^2*b*d^2)*x)*log(b*x + a)^2 - 2*(2*a^2*b*c*d - a^3*d^2$$

$$\begin{aligned}
& 2 + (2*b^3*c*d - a*b^2*d^2)*x^2 + 2*(2*a*b^2*c*d - a^2*b*d^2)*x*\log(d*x + \\
& c)^2 + 2*(4*b^3*c^2 - 5*a*b^2*c*d + a^2*b*d^2)*x + 2*(4*a^2*b*c*d - a^3*d^2 \\
& + (4*b^3*c*d - a*b^2*d^2)*x^2 + 2*(4*a*b^2*c*d - a^2*b*d^2)*x)*\log(b*x + a \\
& ) - 2*(4*a^2*b*c*d - a^3*d^2 + (4*b^3*c*d - a*b^2*d^2)*x^2 + 2*(4*a*b^2*c*d \\
& - a^2*b*d^2)*x - 2*(2*a^2*b*c*d - a^3*d^2 + (2*b^3*c*d - a*b^2*d^2)*x^2 + \\
& 2*(2*a*b^2*c*d - a^2*b*d^2)*x)*\log(b*x + a))*\log(d*x + c))/(a^2*b^4*c^2*g^3 \\
& - 2*a^3*b^3*c*d*g^3 + a^4*b^2*d^2*g^3 + (b^6*c^2*g^3 - 2*a*b^5*c*d*g^3 + a \\
& ^2*b^4*d^2*g^3)*x^2 + 2*(a*b^5*c^2*g^3 - 2*a^2*b^4*c*d*g^3 + a^3*b^3*d^2*g^ \\
& 3)*x))*B^2*d*i - 1/2*A*B*d*i*(2*(2*b*x + a)*\log(b*e*x/(d*x + c) + a*e/(d*x \\
& + c))/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) + (3*a*b*c - a^2*d + 2*(2 \\
& *b^2*c - a*b*d)*x)/((b^5*c - a*b^4*d)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3 \\
& *x + (a^2*b^3*c - a^3*b^2*d)*g^3) + 2*(2*b*c*d - a*d^2)*\log(b*x + a)/((b^4* \\
& c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3) - 2*(2*b*c*d - a*d^2)*\log(d*x + c)/(( \\
& b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3)) + 1/2*A*B*c*i*((2*b*d*x - b*c + \\
& 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^ \\
& 2*c - a^3*b*d)*g^3) - 2*\log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^3*g^3*x^2 + \\
& 2*a*b^2*g^3*x + a^2*b*g^3) + 2*d^2*\log(b*x + a)/((b^3*c^2 - 2*a*b^2*c*d + \\
& a^2*b*d^2)*g^3) - 2*d^2*\log(d*x + c)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g \\
& ^3)) - 1/2*B^2*c*i*\log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^3*g^3*x^2 + 2 \\
& *a*b^2*g^3*x + a^2*b*g^3) - 1/2*(2*b*x + a)*A^2*d*i/(b^4*g^3*x^2 + 2*a*b^3*g \\
& ^3*x + a^2*b^2*g^3) - 1/2*A^2*c*i/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3)
\end{aligned}$$

**Fricas [B]** time = 0.525851, size = 602, normalized size = 4.27

$$\frac{2\left((2A^2 + 2AB + B^2)b^2cd - (2A^2 + 2AB + B^2)abd^2\right)ix + 2\left(B^2b^2d^2ix^2 + 2B^2b^2cdix + B^2b^2c^2i\right)\log\left(\frac{bex+ae}{dx+c}\right)^2 + \left(2A^2\right)}{4\left((b^5c - ab^4d)g^3x^2 + 2(ab\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^3,x, algorith="fricas")

[Out] -1/4\*(2\*((2\*A^2 + 2\*A\*B + B^2)\*b^2\*c\*d - (2\*A^2 + 2\*A\*B + B^2)\*a\*b\*d^2)\*i\*x + 2\*(B^2\*b^2\*d^2\*i\*x^2 + 2\*B^2\*b^2\*c\*d\*i\*x + B^2\*b^2\*c^2\*i)\*log((b\*e\*x + a\*e)/(d\*x + c))^2 + ((2\*A^2 + 2\*A\*B + B^2)\*b^2\*c^2 - (2\*A^2 + 2\*A\*B + B^2)\*a^2\*d^2)\*i + 2\*((2\*A\*B + B^2)\*b^2\*d^2\*i\*x^2 + 2\*(2\*A\*B + B^2)\*b^2\*c\*d\*i\*x + (2\*A\*B + B^2)\*b^2\*c^2\*i)\*log((b\*e\*x + a\*e)/(d\*x + c)))/((b^5\*c - a\*b^4\*d)\*g^3\*x^2 + 2\*(a\*b^4\*c - a^2\*b^3\*d)\*g^3\*x + (a^2\*b^3\*c - a^3\*b^2\*d)\*g^3)

**Sympy [B]** time = 13.8162, size = 712, normalized size = 5.05

$$\frac{Bd^2i(2A + B) \log\left(x + \frac{2ABad^3i + 2ABbcd^2i + B^2ad^3i + B^2bcd^2i - \frac{Ba^2d^4i(2A+B)}{ad-bc} + \frac{2Babcd^3i(2A+B)}{ad-bc} - \frac{Bb^2c^2d^2i(2A+B)}{ad-bc}}{4ABbd^3i + 2B^2bd^3i}\right)}{2b^2g^3(ad - bc)} + \frac{Bd^2i(2A + B) \log\left(x + \frac{2A}{ad-bc}\right)}{2b^2g^3(ad - bc)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))\*\*2/(b\*g\*x+a\*g)\*\*3,x)

[Out] 
$$-B*d**2*i*(2*A + B)*\log(x + (2*A*B*a*d**3*i + 2*A*B*b*c*d**2*i + B**2*a*d**3*i + B**2*b*c*d**2*i - B*a**2*d**4*i*(2*A + B)/(a*d - b*c) + 2*B*a*b*c*d**3*i*(2*A + B)/(a*d - b*c) - B*b**2*c**2*d**2*i*(2*A + B)/(a*d - b*c))/(4*A*B*b*d**3*i + 2*B**2*b*d**3*i))/(2*b**2*g**3*(a*d - b*c)) + B*d**2*i*(2*A + B)*\log(x + (2*A*B*a*d**3*i + 2*A*B*b*c*d**2*i + B**2*a*d**3*i + B**2*b*c*d**2*i + B*a**2*d**4*i*(2*A + B)/(a*d - b*c) - 2*B*a*b*c*d**3*i*(2*A + B)/(a*d - b*c) + B*b**2*c**2*d**2*i*(2*A + B)/(a*d - b*c))/(4*A*B*b*d**3*i + 2*B**2*b*d**3*i))/(2*b**2*g**3*(a*d - b*c)) + (B**2*c**2*i + 2*B**2*c*d*i*x + B**2*d**2*i*x**2)*\log(e*(a + b*x)/(c + d*x))**2/(2*a**3*d*g**3 - 2*a**2*b*c*g**3 + 4*a**2*b*d*g**3*x - 4*a*b**2*c*g**3*x + 2*a*b**2*d*g**3*x**2 - 2*b**3*c*g**3*x**2) - (2*A**2*a*d*i + 2*A**2*b*c*i + 2*A*B*a*d*i + 2*A*B*b*c*i + B**2*a*d*i + B**2*b*c*i + x*(4*A**2*b*d*i + 4*A*B*b*d*i + 2*B**2*b*d*i))/(4*a**2*b**2*g**3 + 8*a*b**3*g**3*x + 4*b**4*g**3*x**2) + (-2*A*B*a*d*i - 2*A*B*b*c*i - 4*A*B*b*d*i*x - B**2*a*d*i - B**2*b*c*i - 2*B**2*b*d*i*x)*\log(e*(a + b*x)/(c + d*x))/(2*a**2*b**2*g**3 + 4*a*b**3*g**3*x + 2*b**4*g**3*x**2)$$

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci) \left( B \log\left(\frac{(bx+a)e}{dx+c}\right) + A \right)^2}{(bgx + ag)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^3,x, algorithm="giac")

[Out] integrate((d\*i\*x + c\*i)\*(B\*log((b\*x + a)\*e/(d\*x + c)) + A)^2/(b\*g\*x + a\*g)^3, x)

$$3.62 \quad \int \frac{(ci+dx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(ag+bgx)^4} dx$$

**Optimal.** Leaf size=287

$$\frac{bi(c+dx)^3 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)^2}{3g^4(a+bx)^3(bc-ad)^2} - \frac{2bBi(c+dx)^3 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{9g^4(a+bx)^3(bc-ad)^2} + \frac{di(c+dx)^2 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)^2}{2g^4(a+bx)^2(bc-ad)^2} + \frac{Bdi(c+dx)}{2g^4(a+bx)^2(bc-ad)^2}$$

[Out]  $(B^2 d^2 i (c + d x)^2) / (4 (b^2 c - a^2 d) g^4 (a + b x)^2) - (2 b^2 B^2 i (c + d x)^3) / (27 (b^2 c - a^2 d) g^4 (a + b x)^3) + (B^2 d^2 i (c + d x)^2 (A + B \log[(e(a + b x)) / (c + d x)])) / (2 (b^2 c - a^2 d) g^4 (a + b x)^2) - (2 b^2 B^2 i (c + d x)^3 (A + B \log[(e(a + b x)) / (c + d x)])) / (9 (b^2 c - a^2 d) g^4 (a + b x)^3) + (d^2 i (c + d x)^2 (A + B \log[(e(a + b x)) / (c + d x)]))^2 / (2 (b^2 c - a^2 d) g^4 (a + b x)^2) - (b^2 i (c + d x)^3 (A + B \log[(e(a + b x)) / (c + d x)]))^2 / (3 (b^2 c - a^2 d) g^4 (a + b x)^3)$

**Rubi [C]** time = 2.2905, antiderivative size = 741, normalized size of antiderivative = 2.58, number of steps used = 66, number of rules used = 11, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.275$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2 d^3 i \text{PolyLog} \left( 2, -\frac{d(a+bx)}{bc-ad} \right)}{3b^2 g^4 (bc-ad)^2} + \frac{B^2 d^3 i \text{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right)}{3b^2 g^4 (bc-ad)^2} + \frac{B d^3 i \log(a+bx) \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{3b^2 g^4 (bc-ad)^2} - \frac{B d^3 i \log(c+dx) (B \log \left( \frac{e(a+bx)}{c+dx} \right) + A)}{3b^2 g^4 (bc-ad)^2}$$

Antiderivative was successfully verified.

[In] Int[((c\*i + d\*i\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))^2)/(a\*g + b\*g\*x)^4, x]

[Out]  $(-2 B^2 (b^2 c - a^2 d) i) / (27 b^2 g^4 (a + b x)^3) + (B^2 d^2 i) / (36 b^2 g^4 (a + b x)^2) + (5 B^2 d^2 i) / (18 b^2 (b^2 c - a^2 d) g^4 (a + b x)) + (5 B^2 d^3 i \log[a + b x]) / (18 b^2 (b^2 c - a^2 d) g^4) - (B^2 d^3 i \log[a + b x]^2) / (6 b^2 (b^2 c - a^2 d) g^4) - (2 B^2 (b^2 c - a^2 d) i (A + B \log[(e(a + b x)) / (c + d x)])) / (9 b^2 g^4 (a + b x)^3) - (B^2 d^2 i (A + B \log[(e(a + b x)) / (c + d x)])) / (6 b^2 g^4 (a + b x)^2) + (B^2 d^2 i (A + B \log[(e(a + b x)) / (c + d x)])) / (3 b^2 (b^2 c - a^2 d) g^4 (a + b x)) + (B^2 d^3 i \log[a + b x] (A + B \log[(e(a + b x)) / (c + d x)])) / (3 b^2 (b^2 c - a^2 d) g^4) - ((b^2 c - a^2 d) i (A + B \log[(e(a + b x)) / (c + d x)]))^2 / (3 b^2 g^4 (a + b x)^3) - (d^2 i (A + B \log[(e(a + b x)) / (c + d x)]))^2 / (2 b^2 g^4 (a + b x)^2) - (5 B^2 d^3 i \log[c + d x]) / (18 b^2 (b^2 c - a^2 d) g^4) + (B^2 d^3 i \log[-((d(a + b x)) / (b^2 c - a^2 d))]) / (18 b^2 (b^2 c - a^2 d) g^4)$

```
] *Log[c + d*x])/(3*b^2*(b*c - a*d)^2*g^4) - (B*d^3*i*(A + B*Log[(e*(a + b*x)) / (c + d*x)]) * Log[c + d*x]) / (3*b^2*(b*c - a*d)^2*g^4) - (B^2*d^3*i*Log[c + d*x]^2) / (6*b^2*(b*c - a*d)^2*g^4) + (B^2*d^3*i*Log[a + b*x]*Log[(b*(c + d*x)) / (b*c - a*d)]) / (3*b^2*(b*c - a*d)^2*g^4) + (B^2*d^3*i*PolyLog[2, -((d*(a + b*x)) / (b*c - a*d))]) / (3*b^2*(b*c - a*d)^2*g^4) + (B^2*d^3*i*PolyLog[2, (b*(c + d*x)) / (b*c - a*d)]) / (3*b^2*(b*c - a*d)^2*g^4)
```

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_.))^(m_.)*((c_.) + (d_.)*(x_.))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_.)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x
), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rubi steps

$$\begin{aligned}
\int \frac{(62c + 62dx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(ag + bgx)^4} dx &= \int \left( \frac{62(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{bg^4(a + bx)^4} + \frac{62d \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{bg^4(a + bx)^3} \right) dx \\
&= \frac{(62d) \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(a+bx)^3} dx}{bg^4} + \frac{(62(bc - ad)) \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(a+bx)^4} dx}{bg^4} \\
&= -\frac{62(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{3b^2g^4(a + bx)^3} - \frac{31d \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g^4(a + bx)^2} + \frac{(62Bd)}{3b} \\
&= -\frac{62(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{3b^2g^4(a + bx)^3} - \frac{31d \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g^4(a + bx)^2} + \frac{(62Bd)}{3b} \\
&= -\frac{62(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{3b^2g^4(a + bx)^3} - \frac{31d \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g^4(a + bx)^2} + \frac{(62Bd)}{3b} \\
&= -\frac{62(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{3b^2g^4(a + bx)^3} - \frac{31d \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g^4(a + bx)^2} + \frac{(124Ba)}{3b} \\
&= -\frac{124B(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{9b^2g^4(a + bx)^3} - \frac{31Bd \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{3b^2g^4(a + bx)^2} + \frac{62Ba}{3b} \\
&= -\frac{124B(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{9b^2g^4(a + bx)^3} - \frac{31Bd \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{3b^2g^4(a + bx)^2} + \frac{62Ba}{3b} \\
&= -\frac{124B(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{9b^2g^4(a + bx)^3} - \frac{31Bd \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{3b^2g^4(a + bx)^2} + \frac{62Ba}{3b} \\
&= -\frac{124B^2(bc - ad)}{27b^2g^4(a + bx)^3} + \frac{31B^2d}{18b^2g^4(a + bx)^2} + \frac{155B^2d^2}{9b^2(bc - ad)g^4(a + bx)} + \frac{155B^2d^3}{9b^2(bc - ad)g^4(a + bx)} \\
&= -\frac{124B^2(bc - ad)}{27b^2g^4(a + bx)^3} + \frac{31B^2d}{18b^2g^4(a + bx)^2} + \frac{155B^2d^2}{9b^2(bc - ad)g^4(a + bx)} + \frac{155B^2d^3}{9b^2(bc - ad)g^4(a + bx)} \\
&= -\frac{124B^2(bc - ad)}{27b^2g^4(a + bx)^3} + \frac{31B^2d}{18b^2g^4(a + bx)^2} + \frac{155B^2d^2}{9b^2(bc - ad)g^4(a + bx)} + \frac{155B^2d^3}{9b^2(bc - ad)g^4(a + bx)} \\
&= -\frac{124B^2(bc - ad)}{27b^2g^4(a + bx)^3} + \frac{31B^2d}{18b^2g^4(a + bx)^2} + \frac{155B^2d^2}{9b^2(bc - ad)g^4(a + bx)} + \frac{155B^2d^3}{9b^2(bc - ad)g^4(a + bx)}
\end{aligned}$$

**Mathematica [C]** time = 1.10025, size = 1035, normalized size = 3.61

$$i \left( 36 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 (bc - ad)^3 + 54d(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 (bc - ad)^2 + 27Bd(a + bx) \left( 2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 (bc - ad) + 27Bd(a + bx) \right) \right)$$

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2)/(a\*g + b\*g\*x)^4,x]

[Out] 
$$-(i*(36*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 54*d*(b*c - a*d)^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 27*B*d*(a + b*x)*(2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 4*d*(-(b*c) + a*d)*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 4*d^2*(a + b*x)^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 4*d^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] - 4*B*d*(a + b*x)*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) + B*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) + 2*B*d^2*(a + b*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 2*B*d^2*(a + b*x)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + 2*B*(12*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 18*d*(b*c - a*d)^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 36*d^2*(b*c - a*d)*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 36*d^3*(a + b*x)^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 36*d^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + 36*B*d^2*(a + b*x)^2*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - 9*B*d*(a + b*x)*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) + 2*B*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) - 18*B*d^3*(a + b*x)^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 18*B*d^3*(a + b*x)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(108*b^2*(b*c - a*d)^2*g^4*(a + b*x)^3)$$

**Maple [B]** time = 0.055, size = 1765, normalized size = 6.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.



[In]  $\text{int}((d*i*x+c*i)*(A+B*\ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4,x)$

[Out]  $\frac{1}{2}e^{2d^2i}/(a*d-b*c)^3/g^4A^2/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{2*a-1}/2e^{2d^2i}/(a*d-b*c)^3/g^4A^2/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{2*b*c-1}/3e^{3d^2i}/(a*d-b*c)^3/g^4A^2b/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{3*a+1}/3e^{3i}/(a*d-b*c)^3/g^4A^2b^2/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{3*c+e^2d^2i}/(a*d-b*c)^3/g^4A*B/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-e^2d^2i}/(a*d-b*c)^3/g^4A*B/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+1/2}e^{2d^2i}/(a*d-b*c)^3/g^4A*B/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{2*a-1/2}e^{2d^2i}/(a*d-b*c)^3/g^4A*B/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{2*b*c-2/3}e^{3d^2i}/(a*d-b*c)^3/g^4A*B*b/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+2/3}e^{3i}/(a*d-b*c)^3/g^4A*B*b^2/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-2/9}e^{3d^2i}/(a*d-b*c)^3/g^4A*B*b/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{3*a+2/9}e^{3i}/(a*d-b*c)^3/g^4A*B*b^2/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{3*c+1/2}e^{2d^2i}/(a*d-b*c)^3/g^4B^2/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))}e^{2d^2i}/(a*d-b*c)^3/g^4B^2/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+1/4}e^{2d^2i}/(a*d-b*c)^3/g^4B^2/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{2*a-1/4}e^{2d^2i}/(a*d-b*c)^3/g^4B^2/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{2*b*c-1/3}e^{3d^2i}/(a*d-b*c)^3/g^4B^2b/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))}e^{2a+1/3}e^{3i}/(a*d-b*c)^3/g^4B^2b^2/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))}e^{2c-2/9}e^{3d^2i}/(a*d-b*c)^3/g^4B^2b/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+2/9}e^{3i}/(a*d-b*c)^3/g^4B^2b^2/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-2/27}e^{3d^2i}/(a*d-b*c)^3/g^4B^2b/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{3*a+2/27}e^{3i}/(a*d-b*c)^3/g^4B^2b^2/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^{3*c}$

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**Maxima [B]** time = 2.51904, size = 4431, normalized size = 15.44

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In]  $\text{integrate}((d*i*x+c*i)*(A+B*\log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4,x, \text{algorithm}="maxima")$

[Out]  $-1/6*(3*b*x + a)*B^2*d*i*\log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^5*g^4*x^$

$$\begin{aligned}
& 3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) - 1/54*(6*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + (4*b^3*c^3 - 27*a*b^2*c^2*d + 108*a^2*b*c*d^2 - 85*a^3*d^3 + 66*(b^3*c*d^2 - a*b^2*d^3)*x^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a)^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(d*x + c)^2 - 3*(5*b^3*c^2*d - 54*a*b^2*c*d^2 + 49*a^2*b*d^3)*x + 66*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a) - 6*(11*b^3*d^3*x^3 + 33*a*b^2*d^3*x^2 + 33*a^2*b*d^3*x + 11*a^3*d^3 - 6*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a))*log(d*x + c))/(a^3*b^4*c^3*g^4 - 3*a^4*b^3*c^2*d*g^4 + 3*a^5*b^2*c*d^2*g^4 - a^6*b*d^3*g^4 + (b^7*c^3*g^4 - 3*a*b^6*c^2*d*g^4 + 3*a^2*b^5*c*d^2*g^4 - a^3*b^4*d^3*g^4)*x^3 + 3*(a*b^6*c^3*g^4 - 3*a^2*b^5*c^2*d*g^4 + 3*a^3*b^4*c*d^2*g^4 - a^4*b^3*d^3*g^4)*x^2 + 3*(a^2*b^5*c^3*g^4 - 3*a^3*b^4*c^2*d*g^4 + 3*a^4*b^3*c*d^2*g^4 - a^5*b^2*d^3*g^4)*x))*B^2*c*i - 1/108*(6*((5*a*b^2*c^2 - 22*a^2*b*c*d + 5*a^3*d^2 - 6*(3*b^3*c*d - a*b^2*d^2)*x^2 + 3*(3*b^3*c^2 - 16*a*b^2*c*d + 5*a^2*b*d^2)*x)/((b^7*c^2 - 2*a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3*(a*b^6*c^2 - 2*a^2*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*c*d + a^4*b^3*d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4) - 6*(3*b*c*d^2 - a*d^3)*log(b*x + a)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4) + 6*(3*b*c*d^2 - a*d^3)*log(d*x + c)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + (19*a*b^3*c^3 - 189*a^2*b^2*c^2*d + 189*a^3*b*c*d^2 - 19*a^4*d^3 - 6*(27*b^4*c^2*d - 32*a*b^3*c*d^2 + 5*a^2*b^2*d^3)*x^2 + 18*(3*a^3*b*c*d^2 - a^4*d^3 + (3*b^4*c*d^2 - a*b^3*d^3)*x^3 + 3*(3*a*b^3*c*d^2 - a^2*b^2*d^3)*x^2 + 3*(3*a^2*b^2*c*d^2 - a^3*b*d^3)*x)*log(b*x + a)^2 + 18*(3*a^3*b*c*d^2 - a^4*d^3 + (3*b^4*c*d^2 - a*b^3*d^3)*x^3 + 3*(3*a*b^3*c*d^2 - a^2*b^2*d^3)*x^2 + 3*(3*a^2*b^2*c*d^2 - a^3*b*d^3)*x)*log(d*x + c)^2 + 3*(9*b^4*c^3 - 125*a*b^3*c^2*d + 135*a^2*b^2*c*d^2 - 19*a^3*b*d^3)*x - 6*(27*a^3*b*c*d^2 - 5*a^4*d^3 + (27*b^4*c*d^2 - 5*a*b^3*d^3)*x^3 + 3*(27*a*b^3*c*d^2 - 5*a^2*b^2*d^3)*x^2 + 3*(27*a^2*b^2*c*d^2 - 5*a^3*b*d^3)*x)*log(b*x + a) + 6*(27*a^3*b*c*d^2 - 5*a^4*d^3 + (27*b^4*c*d^2 - 5*a*b^3*d^3)*x^3 + 3*(27*a*b^3*c*d^2 - 5*a^2*b^2*d^3)*x^2 + 3*(27*a^2*b^2*c*d^2 - 5*a^3*b*d^3)*x - 6*(3*a^3*b*c*d^2 - a^4*d^3 + (3*b^4*c*d^2 - a*b^3*d^3)*x^3 + 3*(3*a*b^3*c*d^2 - a^2*b^2*d^3)*x^2 + 3*(3*a^2*b^2*c*d^2 - a^3*b*d^3)*x)*log(b*x + a))*log(d*x + c))/(a^3*b^5*c^3*g^4 - 3*a^4*b^4*c^2*d*g^4 + 3*a^5*b^3*c*d^2*g^4 - a^6*b^2*d^3*g^4 + (b^8*c^3*g^4 - 3*a*b^7*c^2*d*g^4 + 3*a^2*b^6*c*d^2*g^4 - a^3*b^5*d^3*g^4)*x^3 + 3*(a*b^7*c^3*g^4 - 3*a^2*b^6*c^2*d*g^4 + 3*a^3*b^5*c*d^2*g^4 - a^4*b^4*d^3*g^4)*x^2 + 3*(a^2*b^6*c^3*g^4 - 3*a^3*b^5*c^2*d*g^4 + 3*a^4*b^4*c*d^2*g^4 - a^5*b^3*d^3*g^4)*x))*B^2*d*i - 1/18*A*B*d*i*(6*(3*b*x + a)*log(b*e*x/(d*x + c) + a*e/(
\end{aligned}$$

$$\begin{aligned}
& d*x + c)) / (b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) + \\
& (5*a*b^2*c^2 - 22*a^2*b*c*d + 5*a^3*d^2 - 6*(3*b^3*c*d - a*b^2*d^2)*x^2 + \\
& 3*(3*b^3*c^2 - 16*a*b^2*c*d + 5*a^2*b*d^2)*x) / ((b^7*c^2 - 2*a*b^6*c*d + a^2 \\
& *b^5*d^2)*g^4*x^3 + 3*(a*b^6*c^2 - 2*a^2*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3 \\
& *(a^2*b^5*c^2 - 2*a^3*b^4*c*d + a^4*b^3*d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b \\
& ^3*c*d + a^5*b^2*d^2)*g^4) - 6*(3*b*c*d^2 - a*d^3)*\log(b*x + a) / ((b^5*c^3 - \\
& 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4) + 6*(3*b*c*d^2 - a*d^3 \\
& )*\log(d*x + c) / ((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g \\
& ^4)) - 1/9*A*B*c*i*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3 \\
& *(b^2*c*d - 5*a*b*d^2)*x) / ((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + \\
& 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^ \\
& 3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)* \\
& g^4) + 6*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) / (b^4*g^4*x^3 + 3*a*b^3*g^4*x^ \\
& 2 + 3*a^2*b^2*g^4*x + a^3*b*g^4) + 6*d^3*\log(b*x + a) / ((b^4*c^3 - 3*a*b^3*c \\
& ^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*\log(d*x + c) / ((b^4*c^3 - 3 \\
& *a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4)) - 1/3*B^2*c*i*\log(b*e*x/( \\
& d*x + c) + a*e/(d*x + c))^2 / (b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4* \\
& x + a^3*b*g^4) - 1/6*(3*b*x + a)*A^2*d*i / (b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3 \\
& *a^2*b^3*g^4*x + a^3*b^2*g^4) - 1/3*A^2*c*i / (b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 \\
& + 3*a^2*b^2*g^4*x + a^3*b*g^4)
\end{aligned}$$

**Fricas [B]** time = 0.560472, size = 1249, normalized size = 4.35

$$6((6AB + 5B^2)b^3cd^2 - (6AB + 5B^2)ab^2d^3)ix^2 - 3((18A^2 + 6AB - B^2)b^3c^2d - 18(2A^2 + 2AB + B^2)ab^2cd^2 + (18A^2 + 6AB - B^2)ab^2d^3)ix^2 - 3((18A^2 + 6AB - B^2)b^3c^2d - 18(2A^2 + 2AB + B^2)ab^2cd^2 + (18A^2 + 6AB - B^2)ab^2d^3)ix^2$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^4,x, algorith="fricas")

[Out] 1/108\*(6\*((6\*A\*B + 5\*B^2)\*b^3\*c\*d^2 - (6\*A\*B + 5\*B^2)\*a\*b^2\*d^3)\*i\*x^2 - 3\*((18\*A^2 + 6\*A\*B - B^2)\*b^3\*c^2\*d - 18\*(2\*A^2 + 2\*A\*B + B^2)\*a\*b^2\*c\*d^2 + (18\*A^2 + 30\*A\*B + 19\*B^2)\*a^2\*b\*d^3)\*i\*x + 18\*(B^2\*b^3\*d^3\*i\*x^3 + 3\*B^2\*a\*b^2\*d^3\*i\*x^2 - 3\*(B^2\*b^3\*c^2\*d - 2\*B^2\*a\*b^2\*c\*d^2)\*i\*x - (2\*B^2\*b^3\*c^3 - 3\*B^2\*a\*b^2\*c^2\*d)\*i)\*\log((b\*e\*x + a\*e)/(d\*x + c))^2 - (4\*(9\*A^2 + 6\*A\*B + 2\*B^2)\*b^3\*c^3 - 27\*(2\*A^2 + 2\*A\*B + B^2)\*a\*b^2\*c^2\*d + (18\*A^2 + 30\*A\*B + 19\*B^2)\*a^3\*d^3)\*i + 6\*((6\*A\*B + 5\*B^2)\*b^3\*d^3\*i\*x^3 + 3\*(2\*B^2\*b^3\*c\*d^2 + 3\*(2\*A\*B + B^2)\*a\*b^2\*d^3)\*i\*x^2 - 3\*((6\*A\*B + B^2)\*b^3\*c^2\*d - 6\*(2\*A\*B + B^2)\*a\*b^2\*c\*d^2)\*i\*x - (4\*(3\*A\*B + B^2)\*b^3\*c^3 - 9\*(2\*A\*B + B^2)\*a\*b^2\*c^2\*d)\*i)\*\log((b\*e\*x + a\*e)/(d\*x + c))) / ((b^7\*c^2 - 2\*a\*b^6\*c\*d + a^2\*b^5\*d^2)\*g^4\*x^3 + 3\*(a\*b^6\*c^2 - 2\*a^2\*b^5\*c\*d + a^3\*b^4\*d^2)\*g^4\*x^2 + 3\*(a^2\*b^5\*c^2 - 2\*a^3\*b^4\*c\*d + a^4\*b^3\*d^2)\*g^4\*x + (a^3\*b^4\*c^2 - 2\*a^4\*b^3\*c\*d + a^5\*b^2\*d^2)\*g^4)

$$5*d^2)*g^4*x^3 + 3*(a*b^6*c^2 - 2*a^2*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*c*d + a^4*b^3*d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4)$$

**Sympy [B]** time = 27.9882, size = 1386, normalized size = 4.83

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))\*2/(b\*g\*x+a\*g)\*\*4,x)

[Out] 
$$-B*d**3*i*(6*A + 5*B)*\log(x + (6*A*B*a*d**4*i + 6*A*B*b*c*d**3*i + 5*B**2*a*d**4*i + 5*B**2*b*c*d**3*i - B*a**3*d**6*i*(6*A + 5*B)/(a*d - b*c)**2 + 3*B*a**2*b*c*d**5*i*(6*A + 5*B)/(a*d - b*c)**2 - 3*B*a*b**2*c**2*d**4*i*(6*A + 5*B)/(a*d - b*c)**2 + B*b**3*c**3*d**3*i*(6*A + 5*B)/(a*d - b*c)**2)/(12*A*B*b*d**4*i + 10*B**2*b*d**4*i))/(18*b**2*g**4*(a*d - b*c)**2) + B*d**3*i*(6*A + 5*B)*\log(x + (6*A*B*a*d**4*i + 6*A*B*b*c*d**3*i + 5*B**2*a*d**4*i + 5*B**2*b*c*d**3*i + B*a**3*d**6*i*(6*A + 5*B)/(a*d - b*c)**2 - 3*B*a**2*b*c*d**5*i*(6*A + 5*B)/(a*d - b*c)**2 + 3*B*a*b**2*c**2*d**4*i*(6*A + 5*B)/(a*d - b*c)**2 - B*b**3*c**3*d**3*i*(6*A + 5*B)/(a*d - b*c)**2)/(12*A*B*b*d**4*i + 10*B**2*b*d**4*i))/(18*b**2*g**4*(a*d - b*c)**2) + (3*B**2*a*c**2*d*i + 6*B**2*a*c*d**2*i*x + 3*B**2*a*d**3*i*x**2 - 2*B**2*b*c**3*i - 3*B**2*b*c**2*d*i*x + B**2*b*d**3*i*x**3)*\log(e*(a + b*x)/(c + d*x))**2/(6*a**5*d**2*g**4 - 12*a**4*b*c*d*g**4 + 18*a**4*b*d**2*g**4*x + 6*a**3*b**2*c**2*g**4 - 36*a**3*b**2*c*d*g**4*x + 18*a**3*b**2*d**2*g**4*x**2 + 18*a**2*b**3*c**2*g**4*x - 36*a**2*b**3*c*d*g**4*x**2 + 6*a**2*b**3*d**2*g**4*x**3 + 18*a*b**4*c**2*g**4*x**2 - 12*a*b**4*c*d*g**4*x**3 + 6*b**5*c**2*g**4*x**3) + (-6*A*B*a**2*d**2*i - 6*A*B*a*b*c*d*i - 18*A*B*a*b*d**2*i*x + 12*A*B*b**2*c**2*i + 18*A*B*b**2*c*d*i*x - 5*B**2*a**2*d**2*i - 5*B**2*a*b*c*d*i - 15*B**2*a*b*d**2*i*x + 4*B**2*b**2*c**2*i + 3*B**2*b**2*c*d*i*x - 6*B**2*b**2*d**2*i*x**2)*\log(e*(a + b*x)/(c + d*x))/(18*a**4*b**2*d*g**4 - 18*a**3*b**3*c*g**4 + 54*a**3*b**3*d*g**4*x - 54*a**2*b**4*c*g**4*x + 54*a**2*b**4*d*g**4*x**2 - 54*a*b**5*c*g**4*x**2 + 18*a*b**5*d*g**4*x**3 - 18*b**6*c*g**4*x**3) - (18*A**2*a**2*d**2*i + 18*A**2*a*b*c*d*i - 36*A**2*b**2*c**2*i + 30*A*B*a**2*d**2*i + 30*A*B*a*b*c*d*i - 24*A*B*b**2*c**2*i + 19*B**2*a**2*d**2*i + 19*B**2*a*b*c*d*i - 8*B**2*b**2*c**2*i + x**2*(36*A*B*b**2*d**2*i + 30*B**2*b**2*d**2*i) + x*(54*A**2*a*b*d**2*i - 54*A**2*b**2*c*d*i + 90*A*B*a*b*d**2*i - 18*A*B*b**2*c*d*i + 57*B**2*a*b*d**2*i + 3*B**2*b**2*c*d*i))/(108*a**4*b**2*d*g**4 - 108*a**3*b**3*c*g**4 + x**3*(108*a*b**5*d*g**4 - 108*b**6*c*g**4) + x**2*(324*a**2*b**4*d*g**4 - 324*a*b**5*c*g**4) + x*(324*a**3*b**3*d*g**4 - 324*a**2*b**4*c*g**4))$$

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci) \left( B \log \left( \frac{(bx+a)e}{dx+c} \right) + A \right)^2}{(bgx + ag)^4} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4,x, algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g)^4, x)
```

$$3.63 \quad \int \frac{(ci+dx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(ag+bgx)^5} dx$$

**Optimal.** Leaf size=445

$$\frac{b^2 i(c+dx)^4 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)^2}{4g^5(a+bx)^4(bc-ad)^3} - \frac{b^2 Bi(c+dx)^4 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{8g^5(a+bx)^4(bc-ad)^3} - \frac{d^2 i(c+dx)^2 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)^2}{2g^5(a+bx)^2(bc-ad)^3} - \frac{Bd^2 i(c+dx)^2 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{2g^5(a+bx)^2(bc-ad)^3}$$

[Out]  $-(B^2 d^2 i (c+dx)^2)/(4(b^2 c - a^2 d)^3 g^5 (a+bx)^2) + (4 b^2 B^2 d^2 i (c+dx)^3)/(27(b^2 c - a^2 d)^3 g^5 (a+bx)^3) - (b^2 B^2 i (c+dx)^4)/(32(b^2 c - a^2 d)^3 g^5 (a+bx)^4) - (B^2 d^2 i (c+dx)^2 (A + B \log[(e(a+bx))/(c+dx)]))/(2(b^2 c - a^2 d)^3 g^5 (a+bx)^2) + (4 b^2 B^2 d^2 i (c+dx)^3 (A + B \log[(e(a+bx))/(c+dx)]))/(9(b^2 c - a^2 d)^3 g^5 (a+bx)^3) - (b^2 B^2 i (c+dx)^4 (A + B \log[(e(a+bx))/(c+dx)]))/(8(b^2 c - a^2 d)^3 g^5 (a+bx)^4) - (d^2 i (c+dx)^2 (A + B \log[(e(a+bx))/(c+dx)]))^2/(2(b^2 c - a^2 d)^3 g^5 (a+bx)^2) + (2 b^2 d^2 i (c+dx)^3 (A + B \log[(e(a+bx))/(c+dx)]))^2/(3(b^2 c - a^2 d)^3 g^5 (a+bx)^3) - (b^2 i (c+dx)^4 (A + B \log[(e(a+bx))/(c+dx)]))^2/(4(b^2 c - a^2 d)^3 g^5 (a+bx)^4)$

**Rubi [C]** time = 2.61133, antiderivative size = 826, normalized size of antiderivative = 1.86, number of steps used = 74, number of rules used = 11, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.275$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2 i \log^2(a+bx) d^4}{12b^2(bc-ad)^3 g^5} + \frac{B^2 i \log^2(c+dx) d^4}{12b^2(bc-ad)^3 g^5} - \frac{13B^2 i \log(a+bx) d^4}{72b^2(bc-ad)^3 g^5} - \frac{Bi \log(a+bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) d^4}{6b^2(bc-ad)^3 g^5} + \frac{13B^2 i \log(c+dx) d^4}{72b^2(bc-ad)^3 g^5}$$

Antiderivative was successfully verified.

[In] Int[((c\*i + d\*i\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))^2)/(a\*g + b\*g\*x)^5, x]

[Out]  $-(B^2(b^2 c - a^2 d) i)/(32 b^2 g^5 (a+bx)^4) + (5 B^2 d^2 i)/(216 b^2 g^5 (a+bx)^3) + (B^2 d^2 i)/(144 b^2 (b^2 c - a^2 d) g^5 (a+bx)^2) - (13 B^2 d^2 i)/(72 b^2 (b^2 c - a^2 d)^2 g^5 (a+bx)) - (13 B^2 d^4 i \log[a+bx])/(72 b^2 (b^2 c - a^2 d)^3 g^5) + (B^2 d^4 i \log[a+bx]^2)/(12 b^2 (b^2 c - a^2 d)^3 g^5) - (B(b^2 c - a^2 d) i (A + B \log[(e(a+bx))/(c+dx)]))/(8 b^2 g^5 (a+bx)^4) - (B d^2 i (A + B \log[(e(a+bx))/(c+dx)]))/(18 b^2 g^5 (a+bx)^3) + (B d^2 i (A + B \log[(e(a+bx))/(c+dx)]))/(12 b^2 (b^2 c - a^2 d) g^5 (a+bx)^2)$

```

)*g^5*(a + b*x)^2) - (B*d^3*i*(A + B*Log[(e*(a + b*x))/(c + d*x]]))/(6*b^2*
(b*c - a*d)^2*g^5*(a + b*x)) - (B*d^4*i*Log[a + b*x]*(A + B*Log[(e*(a + b*x)
))/(c + d*x]]))/(6*b^2*(b*c - a*d)^3*g^5) - ((b*c - a*d)*i*(A + B*Log[(e*(a
+ b*x))/(c + d*x]]^2)/(4*b^2*g^5*(a + b*x)^4) - (d*i*(A + B*Log[(e*(a + b
*x))/(c + d*x]]^2)/(3*b^2*g^5*(a + b*x)^3) + (13*B^2*d^4*i*Log[c + d*x]]/(
72*b^2*(b*c - a*d)^3*g^5) - (B^2*d^4*i*Log[-((d*(a + b*x))/(b*c - a*d))] *Lo
g[c + d*x]]/(6*b^2*(b*c - a*d)^3*g^5) + (B*d^4*i*(A + B*Log[(e*(a + b*x))/(
c + d*x]])*Log[c + d*x]]/(6*b^2*(b*c - a*d)^3*g^5) + (B^2*d^4*i*Log[c + d*x
]^2)/(12*b^2*(b*c - a*d)^3*g^5) - (B^2*d^4*i*Log[a + b*x]*Log[(b*(c + d*x))
/(b*c - a*d)]/(6*b^2*(b*c - a*d)^3*g^5) - (B^2*d^4*i*PolyLog[2, -((d*(a +
b*x))/(b*c - a*d))]/(6*b^2*(b*c - a*d)^3*g^5) - (B^2*d^4*i*PolyLog[2, (b*(
c + d*x))/(b*c - a*d)]/(6*b^2*(b*c - a*d)^3*g^5)

```

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]

```

### Rule 2525

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]

```

### Rule 12

```

Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]

```

### Rule 44

```

Int[((a_) + (b_.)*(x_.))^(m_.)*((c_.) + (d_.)*(x_.))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])

```

### Rule 2524

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_.)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e

```

```
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e^n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x
), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rubi steps



$$\begin{aligned}
\int \frac{(63c + 63dx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(ag + bgx)^5} dx &= \int \left( \frac{63(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{bg^5(a + bx)^5} + \frac{63d \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{bg^5(a + bx)^4} \right) dx \\
&= \frac{(63d) \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(a+bx)^4} dx}{bg^5} + \frac{(63(bc - ad)) \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(a+bx)^5} dx}{bg^5} \\
&= -\frac{63(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{4b^2g^5(a + bx)^4} - \frac{21d \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g^5(a + bx)^3} + \frac{(42Bd)}{4b^2g^5(a + bx)^4} \quad (42Bd) \\
&= -\frac{63(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{4b^2g^5(a + bx)^4} - \frac{21d \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g^5(a + bx)^3} + \frac{(42Bd)}{4b^2g^5(a + bx)^4} \quad (42Bd) \\
&= -\frac{63(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{4b^2g^5(a + bx)^4} - \frac{21d \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g^5(a + bx)^3} + \frac{(42Bd)}{4b^2g^5(a + bx)^4} \quad (42Bd) \\
&= -\frac{63(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{4b^2g^5(a + bx)^4} - \frac{21d \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g^5(a + bx)^3} + \frac{(63Bd)}{4b^2g^5(a + bx)^4} \quad (63Bd) \\
&= -\frac{63B(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{8b^2g^5(a + bx)^4} - \frac{7Bd \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{2b^2g^5(a + bx)^3} + \frac{21Bd^2}{4b^2g^5(a + bx)^4} \\
&= -\frac{63B(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{8b^2g^5(a + bx)^4} - \frac{7Bd \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{2b^2g^5(a + bx)^3} + \frac{21Bd^2}{4b^2g^5(a + bx)^4} \\
&= -\frac{63B(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{8b^2g^5(a + bx)^4} - \frac{7Bd \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{2b^2g^5(a + bx)^3} + \frac{21Bd^2}{4b^2g^5(a + bx)^4} \\
&= -\frac{63B^2(bc - ad)}{32b^2g^5(a + bx)^4} + \frac{35B^2d}{24b^2g^5(a + bx)^3} + \frac{7B^2d^2}{16b^2(bc - ad)g^5(a + bx)^2} - \frac{7B^2d^2}{8b^2(bc - ad)g^5(a + bx)^2} \\
&= -\frac{63B^2(bc - ad)}{32b^2g^5(a + bx)^4} + \frac{35B^2d}{24b^2g^5(a + bx)^3} + \frac{7B^2d^2}{16b^2(bc - ad)g^5(a + bx)^2} - \frac{7B^2d^2}{8b^2(bc - ad)g^5(a + bx)^2} \\
&= -\frac{63B^2(bc - ad)}{32b^2g^5(a + bx)^4} + \frac{35B^2d}{24b^2g^5(a + bx)^3} + \frac{7B^2d^2}{16b^2(bc - ad)g^5(a + bx)^2} - \frac{7B^2d^2}{8b^2(bc - ad)g^5(a + bx)^2} \\
&= -\frac{63B^2(bc - ad)}{32b^2g^5(a + bx)^4} + \frac{35B^2d}{24b^2g^5(a + bx)^3} + \frac{7B^2d^2}{16b^2(bc - ad)g^5(a + bx)^2} - \frac{7B^2d^2}{8b^2(bc - ad)g^5(a + bx)^2}
\end{aligned}$$

**Mathematica [C]** time = 1.71301, size = 1340, normalized size = 3.01

$$i \left( 216 \left( A + B \log \left( \frac{e^{(a+bx)}}{c+dx} \right) \right)^2 (bc - ad)^4 - 288d(ad - bc)^3(a + bx) \left( A + B \log \left( \frac{e^{(a+bx)}}{c+dx} \right) \right)^2 + 16Bd(a + bx) \left( 12 \left( A + B \log \left( \frac{e^{(a+bx)}}{c+dx} \right) \right)^2 \right. \right.$$

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2)/(a\*g + b\*g\*x)^5,x]

[Out] 
$$-(i*(216*(b*c - a*d)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - 288*d*(-(b*c) + a*d)^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 16*B*d*(a + b*x)*(12*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 18*d*(b*c - a*d)^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 36*d^2*(b*c - a*d)*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 36*d^3*(a + b*x)^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 36*d^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x] + 36*B*d^2*(a + b*x)^2*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - 9*B*d*(a + b*x)*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) + 2*B*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) - 18*B*d^3*(a + b*x)^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 18*B*d^3*(a + b*x)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 3*B*(36*(b*c - a*d)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 48*d*(-(b*c) + a*d)^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 72*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 144*d^3*(-(b*c) + a*d)*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 144*d^4*(a + b*x)^4*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 144*d^4*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x] - 144*B*d^3*(a + b*x)^3*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) + 36*B*d^2*(a + b*x)^2*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) - 8*B*d*(a + b*x)*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) + 3*B*(3*(b*c - a*d)^4 + 4*d*(-(b*c) + a*d)^3*(a + b*x) + 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 12*d^3*(-(b*c) + a*d)*(a + b*x)^3 - 12*d^4*(a + b*x)^4*Log[a + b*x] + 12*d^4*(a + b*x)^4*Log[c + d*x]) + 72*B*d^4*(a + b*x)^4*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 72*B*d^4*(a + b*x)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(864*b^2*(b*c - a*d)^3*g^5*(a + b*x)^4)$$

**Maple [B]** time = 0.053, size = 2689, normalized size = 6.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In]  $\int ((d*x+c)^i*(A+B*\ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5, x)$

[Out]  $\frac{1}{2}e^{4d*i}/(a*d-b*c)^4/g^5*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-e^2*d^2*i/(a*d-b*c)^4/g^5*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c-1/8*e^4*i/(a*d-b*c)^4/g^5*A*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*c-1/2*e^2*d^2*i/(a*d-b*c)^4/g^5*A^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*b*c-2/3*e^3*d^2*i/(a*d-b*c)^4/g^5*A^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a-1/4*e^4*i/(a*d-b*c)^4/g^5*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-1/8*e^4*i/(a*d-b*c)^4/g^5*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+1/2*e^2*d^3*i/(a*d-b*c)^4/g^5*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a-1/32*e^4*i/(a*d-b*c)^4/g^5*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*c-4/3*e^3*d^2*i/(a*d-b*c)^4/g^5*A*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+4/3*e^3*d*i/(a*d-b*c)^4/g^5*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-1/4*e^4*i/(a*d-b*c)^4/g^5*A^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*c+1/2*e^2*d^3*i/(a*d-b*c)^4/g^5*A^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a+1/4*e^2*d^3*i/(a*d-b*c)^4/g^5*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a+4/9*e^3*d*i/(a*d-b*c)^4/g^5*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*c+1/8*e^4*d*i/(a*d-b*c)^4/g^5*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a-1/2*e^4*i/(a*d-b*c)^4/g^5*A*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-1/2*e^2*d^2*i/(a*d-b*c)^4/g^5*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b*c-1/2*e^2*d^2*i/(a*d-b*c)^4/g^5*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c-2/3*e^3*d^2*i/(a*d-b*c)^4/g^5*B^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+2/3*e^3*d*i/(a*d-b*c)^4/g^5*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-1/2*e^2*d^2*i/(a*d-b*c)^4/g^5*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*b*c-4/9*e^3*d^2*i/(a*d-b*c)^4/g^5*A*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a+1/32*e^4*d*i/(a*d-b*c)^4/g^5*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a+1/2*e^2*d^3*i/(a*d-b*c)^4/g^5*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+2/3*e^3*d*i/(a*d-b*c)^4/g^5*A^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*c+1/4*e^4*d*i/(a*d-b*c)^4/g^5*A^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a+1/2*e^2*d^3*i/(a*d-b*c)^4/g^5*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a-1/4*e^2*d^2*i/(a*d-b*c)^4/g^5*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*b*c-4/27*e^3*d^2*i/(a*d$

$$\begin{aligned}
& -b^4c^4/g^5B^2b/(b^e/d+e/(d^*x+c)*a-e/d/(d^*x+c)*b^c)^3a+4/27e^3d^i/(a^d \\
& -b^4c^4/g^5B^2b^2/(b^e/d+e/(d^*x+c)*a-e/d/(d^*x+c)*b^c)^3c+4/9e^3d^i/(a^d \\
& -b^4c^4/g^5B^2b^2/(b^e/d+e/(d^*x+c)*a-e/d/(d^*x+c)*b^c)^3\ln(b^e/d+(a^d-b^c \\
& c)*e/d/(d^*x+c))^c+1/4e^4d^i/(a^d-b^4c^4/g^5B^2b^2/(b^e/d+e/(d^*x+c)*a-e/ \\
& d/(d^*x+c)*b^c)^4\ln(b^e/d+(a^d-b^c)*e/d/(d^*x+c))^2a+1/8e^4d^i/(a^d-b^4c^4 \\
& /g^5B^2b^2/(b^e/d+e/(d^*x+c)*a-e/d/(d^*x+c)*b^c)^4\ln(b^e/d+(a^d-b^c)*e/d/ \\
& (d^*x+c))^a+e^2d^3i/(a^d-b^4c^4/g^5A*B/(b^e/d+e/(d^*x+c)*a-e/d/(d^*x+c)*b^c \\
& )^2\ln(b^e/d+(a^d-b^c)*e/d/(d^*x+c))^a-4/9e^3d^2i/(a^d-b^4c^4/g^5B^2b/( \\
& b^e/d+e/(d^*x+c)*a-e/d/(d^*x+c)*b^c)^3\ln(b^e/d+(a^d-b^c)*e/d/(d^*x+c))^a
\end{aligned}$$

**Maxima [B]** time = 3.39295, size = 6491, normalized size = 14.59

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x, algor
ithm="maxima")
```

```
[Out] -1/12*(4*b*x + a)*B^2*d*i*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^6*g^5*x
^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g^5) +
1/288*(12*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 +
25*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3))*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^
2 + 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*
d^3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d
^3)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*
d^3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2
*d^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)
*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 -
4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^
4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5))*log(b*e*x/
(d*x + c) + a*e/(d*x + c)) - (9*b^4*c^4 - 64*a*b^3*c^3*d + 216*a^2*b^2*c^2*
d^2 - 576*a^3*b*c*d^3 + 415*a^4*d^4 - 300*(b^4*c*d^3 - a*b^3*d^4))*x^3 + 6*(
13*b^4*c^2*d^2 - 176*a*b^3*c*d^3 + 163*a^2*b^2*d^4))*x^2 + 72*(b^4*d^4*x^4 +
4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a
)^2 + 72*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x
+ a^4*d^4)*log(d*x + c)^2 - 4*(7*b^4*c^3*d - 60*a*b^3*c^2*d^2 + 324*a^2*b^
2*c*d^3 - 271*a^3*b*d^4)*x - 300*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2
*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a) + 12*(25*b^4*d^4*x^4 + 100
*a*b^3*d^4*x^3 + 150*a^2*b^2*d^4*x^2 + 100*a^3*b*d^4*x + 25*a^4*d^4 - 12*(b
^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)
*log(b*x + a))*log(d*x + c))/(a^4*b^5*c^4*g^5 - 4*a^5*b^4*c^3*d*g^5 + 6*a^6
```

$$\begin{aligned}
& *b^3*c^2*d^2*g^5 - 4*a^7*b^2*c*d^3*g^5 + a^8*b*d^4*g^5 + (b^9*c^4*g^5 - 4*a \\
& *b^8*c^3*d*g^5 + 6*a^2*b^7*c^2*d^2*g^5 - 4*a^3*b^6*c*d^3*g^5 + a^4*b^5*d^4* \\
& g^5)*x^4 + 4*(a*b^8*c^4*g^5 - 4*a^2*b^7*c^3*d*g^5 + 6*a^3*b^6*c^2*d^2*g^5 - \\
& 4*a^4*b^5*c*d^3*g^5 + a^5*b^4*d^4*g^5)*x^3 + 6*(a^2*b^7*c^4*g^5 - 4*a^3*b^ \\
& 6*c^3*d*g^5 + 6*a^4*b^5*c^2*d^2*g^5 - 4*a^5*b^4*c*d^3*g^5 + a^6*b^3*d^4*g^5 \\
& )*x^2 + 4*(a^3*b^6*c^4*g^5 - 4*a^4*b^5*c^3*d*g^5 + 6*a^5*b^4*c^2*d^2*g^5 - \\
& 4*a^6*b^3*c*d^3*g^5 + a^7*b^2*d^4*g^5)*x)) * B^2*c*i - 1/864*(12*((7*a*b^3*c^ \\
& 3 - 33*a^2*b^2*c^2*d + 75*a^3*b*c*d^2 - 13*a^4*d^3 + 12*(4*b^4*c*d^2 - a*b^ \\
& 3*d^3))*x^3 - 6*(4*b^4*c^2*d - 29*a*b^3*c*d^2 + 7*a^2*b^2*d^3))*x^2 + 4*(4*b^ \\
& 4*c^3 - 21*a*b^3*c^2*d + 57*a^2*b^2*c*d^2 - 13*a^3*b*d^3)*x)/(b^9*c^3 - 3* \\
& a*b^8*c^2*d + 3*a^2*b^7*c*d^2 - a^3*b^6*d^3)*g^5*x^4 + 4*(a*b^8*c^3 - 3*a^2 \\
& *b^7*c^2*d + 3*a^3*b^6*c*d^2 - a^4*b^5*d^3)*g^5*x^3 + 6*(a^2*b^7*c^3 - 3*a^ \\
& 3*b^6*c^2*d + 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)*g^5*x^2 + 4*(a^3*b^6*c^3 - 3*a \\
& ^4*b^5*c^2*d + 3*a^5*b^4*c*d^2 - a^6*b^3*d^3)*g^5*x + (a^4*b^5*c^3 - 3*a^5* \\
& b^4*c^2*d + 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*g^5) + 12*(4*b*c*d^3 - a*d^4)*lo \\
& g(b*x + a)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 \\
& + a^4*b^2*d^4)*g^5) - 12*(4*b*c*d^3 - a*d^4)*log(d*x + c)/((b^6*c^4 - 4*a*b \\
& ^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*g^5))*log(b*e \\
& *x/(d*x + c) + a*e/(d*x + c)) + (37*a*b^4*c^4 - 304*a^2*b^3*c^3*d + 1512*a^ \\
& 3*b^2*c^2*d^2 - 1360*a^4*b*c*d^3 + 115*a^5*d^4 + 12*(88*b^5*c^2*d^2 - 101*a \\
& *b^4*c*d^3 + 13*a^2*b^3*d^4))*x^3 - 6*(40*b^5*c^3*d - 609*a*b^4*c^2*d^2 + 64 \\
& 8*a^2*b^3*c*d^3 - 79*a^3*b^2*d^4))*x^2 - 72*(4*a^4*b*c*d^3 - a^5*d^4 + (4*b^ \\
& 5*c*d^3 - a*b^4*d^4))*x^4 + 4*(4*a*b^4*c*d^3 - a^2*b^3*d^4))*x^3 + 6*(4*a^2*b \\
& ^3*c*d^3 - a^3*b^2*d^4))*x^2 + 4*(4*a^3*b^2*c*d^3 - a^4*b*d^4)*x*log(b*x + \\
& a)^2 - 72*(4*a^4*b*c*d^3 - a^5*d^4 + (4*b^5*c*d^3 - a*b^4*d^4))*x^4 + 4*(4*a \\
& *b^4*c*d^3 - a^2*b^3*d^4))*x^3 + 6*(4*a^2*b^3*c*d^3 - a^3*b^2*d^4))*x^2 + 4*( \\
& 4*a^3*b^2*c*d^3 - a^4*b*d^4)*x*log(d*x + c)^2 + 4*(16*b^5*c^4 - 163*a*b^4* \\
& c^3*d + 1068*a^2*b^3*c^2*d^2 - 1036*a^3*b^2*c*d^3 + 115*a^4*b*d^4)*x + 12*( \\
& 88*a^4*b*c*d^3 - 13*a^5*d^4 + (88*b^5*c*d^3 - 13*a*b^4*d^4))*x^4 + 4*(88*a*b \\
& ^4*c*d^3 - 13*a^2*b^3*d^4))*x^3 + 6*(88*a^2*b^3*c*d^3 - 13*a^3*b^2*d^4))*x^2 \\
& + 4*(88*a^3*b^2*c*d^3 - 13*a^4*b*d^4)*x*log(b*x + a) - 12*(88*a^4*b*c*d^3 \\
& - 13*a^5*d^4 + (88*b^5*c*d^3 - 13*a*b^4*d^4))*x^4 + 4*(88*a*b^4*c*d^3 - 13*a \\
& ^2*b^3*d^4))*x^3 + 6*(88*a^2*b^3*c*d^3 - 13*a^3*b^2*d^4))*x^2 + 4*(88*a^3*b^2 \\
& *c*d^3 - 13*a^4*b*d^4)*x - 12*(4*a^4*b*c*d^3 - a^5*d^4 + (4*b^5*c*d^3 - a*b \\
& ^4*d^4))*x^4 + 4*(4*a*b^4*c*d^3 - a^2*b^3*d^4))*x^3 + 6*(4*a^2*b^3*c*d^3 - a^ \\
& 3*b^2*d^4))*x^2 + 4*(4*a^3*b^2*c*d^3 - a^4*b*d^4)*x*log(b*x + a))*log(d*x + \\
& c))/(a^4*b^6*c^4*g^5 - 4*a^5*b^5*c^3*d*g^5 + 6*a^6*b^4*c^2*d^2*g^5 - 4*a^7 \\
& *b^3*c*d^3*g^5 + a^8*b^2*d^4*g^5 + (b^10*c^4*g^5 - 4*a*b^9*c^3*d*g^5 + 6*a^ \\
& 2*b^8*c^2*d^2*g^5 - 4*a^3*b^7*c*d^3*g^5 + a^4*b^6*d^4*g^5)*x^4 + 4*(a*b^9*c \\
& ^4*g^5 - 4*a^2*b^8*c^3*d*g^5 + 6*a^3*b^7*c^2*d^2*g^5 - 4*a^4*b^6*c*d^3*g^5 - \\
& a^5*b^5*d^4*g^5)*x^3 + 6*(a^2*b^8*c^4*g^5 - 4*a^3*b^7*c^3*d*g^5 + 6*a^4*b \\
& ^6*c^2*d^2*g^5 - 4*a^5*b^5*c*d^3*g^5 + a^6*b^4*d^4*g^5)*x^2 + 4*(a^3*b^7*c^ \\
& 4*g^5 - 4*a^4*b^6*c^3*d*g^5 + 6*a^5*b^5*c^2*d^2*g^5 - 4*a^6*b^4*c*d^3*g^5 + \\
& a^7*b^3*d^4*g^5)*x)) * B^2*d*i - 1/72*A*B*d*i*(12*(4*b*x + a)*log(b*e*x/(d*x \\
& + c) + a*e/(d*x + c))/(b^6*g^5*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 +
\end{aligned}$$

$$\begin{aligned}
& 4a^3b^3g^5x + a^4b^2g^5) + (7a^3b^3c^3 - 33a^2b^2c^2d + 75a^3b^3c^2d^2 - 13a^4d^3 + 12(4b^4c^2d^2 - ab^3d^3)x^3 - 6(4b^4c^2d - 29ab^3c^2d + 7a^2b^2d^3)x^2 + 4(4b^4c^3 - 21ab^3c^2d + 57a^2b^2c^2d^2 - 13a^3bd^3)x) / ((b^9c^3 - 3a^2b^8c^2d + 3a^2b^7c^2d^2 - a^3b^6d^3)g^5x^4 + 4(a^2b^8c^3 - 3a^2b^7c^2d + 3a^3b^6c^2d^2 - a^4b^5d^3)g^5x^3 + 6(a^2b^7c^3 - 3a^3b^6c^2d + 3a^4b^5c^2d^2 - a^5b^4d^3)g^5x^2 + 4(a^3b^6c^3 - 3a^4b^5c^2d + 3a^5b^4c^2d^2 - a^6b^3d^3)g^5x + (a^4b^5c^3 - 3a^5b^4c^2d + 3a^6b^3c^2d^2 - a^7b^2d^3)g^5) + 12(4b^3c^2d^3 - ad^4) \log(bx + a) / ((b^6c^4 - 4a^2b^5c^3d + 6a^2b^4c^2d^2 - 4a^3b^3c^2d^3 + a^4b^2d^4)g^5) - 12(4b^3c^2d^3 - ad^4) \log(dx + c) / ((b^6c^4 - 4a^2b^5c^3d + 6a^2b^4c^2d^2 - 4a^3b^3c^2d^3 + a^4b^2d^4)g^5) + 1/24ABci * ((12b^3d^3x^3 - 3b^3c^3 + 13a^2b^2c^2d - 23a^2b^2c^2d^2 + 25a^3d^3 - 6(b^3c^2d^2 - 7a^2b^2d^3)x^2 + 4(b^3c^2d - 5a^2b^2c^2d^2 + 13a^2bd^3)x) / ((b^8c^3 - 3a^2b^7c^2d + 3a^2b^6c^2d^2 - a^3b^5d^3)g^5x^4 + 4(a^2b^7c^3 - 3a^2b^6c^2d + 3a^3b^5c^2d^2 - a^4b^4d^3)g^5x^3 + 6(a^2b^6c^3 - 3a^3b^5c^2d + 3a^4b^4c^2d^2 - a^5b^3d^3)g^5x^2 + 4(a^3b^5c^3 - 3a^4b^4c^2d + 3a^5b^3c^2d^2 - a^6b^2d^3)g^5x + (a^4b^4c^3 - 3a^5b^3c^2d + 3a^6b^2c^2d^2 - a^7bd^3)g^5) - 12 \log(bex/(dx + c) + aex/(dx + c)) / (b^5g^5x^4 + 4a^2b^4g^5x^3 + 6a^2b^3g^5x^2 + 4a^3b^2g^5x + a^4bg^5) + 12d^4 \log(bx + a) / ((b^5c^4 - 4a^2b^4c^3d + 6a^2b^3c^2d^2 - 4a^3b^2c^2d^3 + a^4bd^4)g^5) - 12d^4 \log(dx + c) / ((b^5c^4 - 4a^2b^4c^3d + 6a^2b^3c^2d^2 - 4a^3b^2c^2d^3 + a^4bd^4)g^5) - 1/4B^2ci \log(bex/(dx + c) + aex/(dx + c))^2 / (b^5g^5x^4 + 4a^2b^4g^5x^3 + 6a^2b^3g^5x^2 + 4a^3b^2g^5x + a^4bg^5) - 1/12(4bx + a)A^2di / (b^6g^5x^4 + 4a^2b^5g^5x^3 + 6a^2b^4g^5x^2 + 4a^3b^3g^5x + a^4b^2g^5) - 1/4A^2ci / (b^5g^5x^4 + 4a^2b^4g^5x^3 + 6a^2b^3g^5x^2 + 4a^3b^2g^5x + a^4bg^5)
\end{aligned}$$

**Fricas [B]** time = 0.582325, size = 2048, normalized size = 4.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^5,x, algorithm="fricas")

[Out] -1/864\*(12\*((12\*A\*B + 13\*B^2)\*b^4\*c\*d^3 - (12\*A\*B + 13\*B^2)\*a\*b^3\*d^4)\*i\*x^3 - 6\*((12\*A\*B + B^2)\*b^4\*c^2\*d^2 - 16\*(6\*A\*B + 5\*B^2)\*a\*b^3\*c\*d^3 + (84\*A\*B + 79\*B^2)\*a^2\*b^2\*d^4)\*i\*x^2 + 4\*((72\*A^2 + 12\*A\*B - 5\*B^2)\*b^4\*c^3\*d - 12\*(18\*A^2 + 6\*A\*B - B^2)\*a\*b^3\*c^2\*d^2 + 108\*(2\*A^2 + 2\*A\*B + B^2)\*a^2\*b^2\*

```

c*d^3 - (72*A^2 + 156*A*B + 115*B^2)*a^3*b*d^4)*i*x + 72*(B^2*b^4*d^4*i*x^4
+ 4*B^2*a*b^3*d^4*i*x^3 + 6*B^2*a^2*b^2*d^4*i*x^2 + 4*(B^2*b^4*c^3*d - 3*B
^2*a*b^3*c^2*d^2 + 3*B^2*a^2*b^2*c*d^3)*i*x + (3*B^2*b^4*c^4 - 8*B^2*a*b^3*
c^3*d + 6*B^2*a^2*b^2*c^2*d^2)*i)*log((b*e*x + a*e)/(d*x + c))^2 + (27*(8*A
^2 + 4*A*B + B^2)*b^4*c^4 - 64*(9*A^2 + 6*A*B + 2*B^2)*a*b^3*c^3*d + 216*(2
*A^2 + 2*A*B + B^2)*a^2*b^2*c^2*d^2 - (72*A^2 + 156*A*B + 115*B^2)*a^4*d^4)
*i + 12*((12*A*B + 13*B^2)*b^4*d^4*i*x^4 + 4*(3*B^2*b^4*c*d^3 + 2*(6*A*B +
5*B^2)*a*b^3*d^4)*i*x^3 - 6*(B^2*b^4*c^2*d^2 - 8*B^2*a*b^3*c*d^3 - 6*(2*A*B
+ B^2)*a^2*b^2*d^4)*i*x^2 + 4*((12*A*B + B^2)*b^4*c^3*d - 6*(6*A*B + B^2)*
a*b^3*c^2*d^2 + 18*(2*A*B + B^2)*a^2*b^2*c*d^3)*i*x + (9*(4*A*B + B^2)*b^4*
c^4 - 32*(3*A*B + B^2)*a*b^3*c^3*d + 36*(2*A*B + B^2)*a^2*b^2*c^2*d^2)*i)*l
og((b*e*x + a*e)/(d*x + c)))/((b^9*c^3 - 3*a*b^8*c^2*d + 3*a^2*b^7*c*d^2 -
a^3*b^6*d^3)*g^5*x^4 + 4*(a*b^8*c^3 - 3*a^2*b^7*c^2*d + 3*a^3*b^6*c*d^2 - a
^4*b^5*d^3)*g^5*x^3 + 6*(a^2*b^7*c^3 - 3*a^3*b^6*c^2*d + 3*a^4*b^5*c*d^2 -
a^5*b^4*d^3)*g^5*x^2 + 4*(a^3*b^6*c^3 - 3*a^4*b^5*c^2*d + 3*a^5*b^4*c*d^2 -
a^6*b^3*d^3)*g^5*x + (a^4*b^5*c^3 - 3*a^5*b^4*c^2*d + 3*a^6*b^3*c*d^2 - a^
7*b^2*d^3)*g^5)

```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*(b*x+a)/(d*x+c)))*2/(b*g*x+a*g)**5,x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci) \left( B \log \left( \frac{bx+a}{dx+c} \right) + A \right)^2}{(bgx + ag)^5} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x, algor
ithm="giac")
```

```
[Out] integrate((d*i*x + c*i)*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g)^5, x)
```



$$3.64 \quad \int (ag + bgx)^3 (ci + dix)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx$$

**Optimal.** Leaf size=711

$$\frac{B^2 g^3 i^2 (bc - ad)^6 \text{PolyLog} \left( 2, \frac{d(a+bx)}{b(c+dx)} \right)}{30b^3 d^4} - \frac{B g^3 i^2 (bc - ad)^6 \log \left( \frac{bc-ad}{b(c+dx)} \right) \left( 6B \log \left( \frac{e(a+bx)}{c+dx} \right) + 6A + 11B \right)}{180b^3 d^4} - \frac{B g^3 i^2 (a + bx)(b(c+dx) - a)}{60b^3 d^4}$$

[Out]  $(3*B^2*(b*c - a*d)^5*g^3*i^2*x)/(20*b^2*d^3) + (B^2*(b*c - a*d)^2*g^3*i^2*(a + b*x)^4)/(60*b^3) - (3*B^2*(b*c - a*d)^4*g^3*i^2*(c + d*x)^2)/(40*b*d^4) + (B^2*(b*c - a*d)^3*g^3*i^2*(c + d*x)^3)/(60*d^4) - (B*(b*c - a*d)^3*g^3*i^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(90*b^3*d) - (B*(b*c - a*d)^2*g^3*i^2*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(20*b^3) - (B*(b*c - a*d)*g^3*i^2*(a + b*x)^4*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(15*b^2) + ((b*c - a*d)^2*g^3*i^2*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))^2/(60*b^3) + ((b*c - a*d)*g^3*i^2*(a + b*x)^4*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))^2/(15*b^2) + (g^3*i^2*(a + b*x)^4*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))^2/(6*b) + (B*(b*c - a*d)^4*g^3*i^2*(a + b*x)^2*(3*A + B + 3*B*Log[(e*(a + b*x))/(c + d*x)]))/(180*b^3*d^2) - (B*(b*c - a*d)^5*g^3*i^2*(a + b*x)*(6*A + 5*B + 6*B*Log[(e*(a + b*x))/(c + d*x)]))/(180*b^3*d^3) - (B*(b*c - a*d)^6*g^3*i^2*Log[(b*c - a*d)/(b*(c + d*x)]*(6*A + 11*B + 6*B*Log[(e*(a + b*x))/(c + d*x)]))/(180*b^3*d^4) - (B^2*(b*c - a*d)^6*g^3*i^2*Log[c + d*x]/(20*b^3*d^4) - (B^2*(b*c - a*d)^6*g^3*i^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))]/(30*b^3*d^4)$

**Rubi [A]** time = 3.00598, antiderivative size = 790, normalized size of antiderivative = 1.11, number of steps used = 86, number of rules used = 13, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.31$ , Rules used = {2528, 2525, 12, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{B^2 g^3 i^2 (bc - ad)^6 \text{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right)}{30b^3 d^4} + \frac{B g^3 i^2 (bc - ad)^6 \log(c + dx) \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{30b^3 d^4} + \frac{B g^3 i^2 (a + bx)^2 (bc - ad)^4}{60b^3 d^4}$$

Antiderivative was successfully verified.

[In] Int[(a\*g + b\*g\*x)^3\*(c\*i + d\*i\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2, x]

[Out]  $-(A*B*(b*c - a*d)^5*g^3*i^2*x)/(30*b^2*d^3) + (B^2*(b*c - a*d)^5*g^3*i^2*x)/(45*b^2*d^3) - (7*B^2*(b*c - a*d)^4*g^3*i^2*(a + b*x)^2)/(360*b^3*d^2) + (B^2*(b*c - a*d)^3*g^3*i^2*(a + b*x)^3)/(60*b^3*d) + (B^2*(b*c - a*d)^2*g^3*i^2*(a + b*x)^4)/(60*b^3*d) - (B*(b*c - a*d)^3*g^3*i^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(90*b^3*d) - (B*(b*c - a*d)^2*g^3*i^2*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(20*b^3) - (B*(b*c - a*d)*g^3*i^2*(a + b*x)^4*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(15*b^2) + ((b*c - a*d)^2*g^3*i^2*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))^2/(60*b^3) + ((b*c - a*d)*g^3*i^2*(a + b*x)^4*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))^2/(15*b^2) + (g^3*i^2*(a + b*x)^4*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))^2/(6*b) + (B*(b*c - a*d)^4*g^3*i^2*(a + b*x)^2*(3*A + B + 3*B*Log[(e*(a + b*x))/(c + d*x)]))/(180*b^3*d^2) - (B*(b*c - a*d)^5*g^3*i^2*(a + b*x)*(6*A + 5*B + 6*B*Log[(e*(a + b*x))/(c + d*x)]))/(180*b^3*d^3) - (B*(b*c - a*d)^6*g^3*i^2*Log[(b*c - a*d)/(b*(c + d*x)]*(6*A + 11*B + 6*B*Log[(e*(a + b*x))/(c + d*x)]))/(180*b^3*d^4) - (B^2*(b*c - a*d)^6*g^3*i^2*Log[c + d*x]/(20*b^3*d^4) - (B^2*(b*c - a*d)^6*g^3*i^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))]/(30*b^3*d^4)$

$$\begin{aligned}
& i^2(a + b*x)^4/(60*b^3) - (B^2*(b*c - a*d)^5*g^3*i^2*(a + b*x)*\text{Log}[(e*(a + b*x))/(c + d*x)]/(30*b^3*d^3) + (B*(b*c - a*d)^4*g^3*i^2*(a + b*x)^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])/(60*b^3*d^2) - (B*(b*c - a*d)^3*g^3*i^2*(a + b*x)^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])/(90*b^3*d) - (7*B*(b*c - a*d)^2*g^3*i^2*(a + b*x)^4*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])/(60*b^3) - (B*d*(b*c - a*d)*g^3*i^2*(a + b*x)^5*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])/(15*b^3) + ((b*c - a*d)^2*g^3*i^2*(a + b*x)^4*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]^2)/(4*b^3) + (2*d*(b*c - a*d)*g^3*i^2*(a + b*x)^5*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]^2)/(5*b^3) + (d^2*g^3*i^2*(a + b*x)^6*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]^2)/(6*b^3) + (B^2*(b*c - a*d)^6*g^3*i^2*\text{Log}[c + d*x])/(90*b^3*d^4) - (B^2*(b*c - a*d)^6*g^3*i^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/(30*b^3*d^4) + (B*(b*c - a*d)^6*g^3*i^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])*\text{Log}[c + d*x])/(30*b^3*d^4) + (B^2*(b*c - a*d)^6*g^3*i^2*\text{Log}[c + d*x]^2)/(60*b^3*d^4) - (B^2*(b*c - a*d)^6*g^3*i^2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]/(30*b^3*d^4)
\end{aligned}$$

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

```

### Rule 2525

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

```

### Rule 12

```

Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]

```

### Rule 2486

```

Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_.))^(p_.))*((c_.) + (d_.)*(x_.))^(q_.)]^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s - 1/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]

```

Rule 31

```
Int[((a_) + (b_)*(x_))^-1, x_Symbol] := Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_), x_Symbol] := Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_) + Log[(c_)*(RFx_)^(p_)])*(b_)^(n_)/((d_) + (e_)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_))^(n_)])*(b_)^(p_)*(RFx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_))^(n_)])*(b_)/((f_) + (g_)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_))])*(b_)/((f_) + (g_)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_)*((d_) + (e_)*(x_))^(n_)]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\begin{aligned}
\int (64c + 64dx)^2 (ag + bgx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx &= \int \left( \frac{4096(bc-ad)^2 (ag+bgx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2} + \frac{8192d}{b^2} \right) dx \\
&= \frac{(4096(bc-ad)^2) \int (ag+bgx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{b^2} + \frac{8192d}{b^2} \int (ag+bgx)^3 dx \\
&= \frac{1024(bc-ad)^2 g^3 (a+bx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3} + \frac{8192d}{b^3} \int (ag+bgx)^3 dx \\
&= \frac{1024(bc-ad)^2 g^3 (a+bx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3} + \frac{8192d}{b^3} \int (ag+bgx)^3 dx \\
&= \frac{1024(bc-ad)^2 g^3 (a+bx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3} + \frac{8192d}{b^3} \int (ag+bgx)^3 dx \\
&= \frac{1024(bc-ad)^2 g^3 (a+bx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3} + \frac{8192d}{b^3} \int (ag+bgx)^3 dx \\
&= -\frac{2048AB(bc-ad)^5 g^3 x}{15b^2 d^3} + \frac{1024B(bc-ad)^4 g^3 (a+bx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{15b^3 d^2} \\
&= -\frac{2048AB(bc-ad)^5 g^3 x}{15b^2 d^3} - \frac{2048B^2(bc-ad)^5 g^3 (a+bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{15b^3 d^3} \\
&= -\frac{2048AB(bc-ad)^5 g^3 x}{15b^2 d^3} - \frac{2048B^2(bc-ad)^5 g^3 (a+bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{15b^3 d^3} \\
&= -\frac{2048AB(bc-ad)^5 g^3 x}{15b^2 d^3} + \frac{4096B^2(bc-ad)^5 g^3 x}{45b^2 d^3} - \frac{3584B^2(bc-ad)^5 g^3 (a+bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{45b^3 d^3} \\
&= -\frac{2048AB(bc-ad)^5 g^3 x}{15b^2 d^3} + \frac{4096B^2(bc-ad)^5 g^3 x}{45b^2 d^3} - \frac{3584B^2(bc-ad)^5 g^3 (a+bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{45b^3 d^3} \\
&= -\frac{2048AB(bc-ad)^5 g^3 x}{15b^2 d^3} + \frac{4096B^2(bc-ad)^5 g^3 x}{45b^2 d^3} - \frac{3584B^2(bc-ad)^5 g^3 (a+bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{45b^3 d^3} \\
&= -\frac{2048AB(bc-ad)^5 g^3 x}{15b^2 d^3} + \frac{4096B^2(bc-ad)^5 g^3 x}{45b^2 d^3} - \frac{3584B^2(bc-ad)^5 g^3 (a+bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{45b^3 d^3}
\end{aligned}$$

**Mathematica [B]** time = 1.3484, size = 1559, normalized size = 2.19

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (g^3*i^2*(15*(b*c - a*d)^2*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 24*d*(b*c - a*d)*(a + b*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 10*d^2*(a + b*x)^6*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - (5*B*(b*c - a*d)^3*(6*A*b*d*(b*c - a*d)^2*x + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*d^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 6*B*(b*c - a*d)^3*Log[c + d*x] - 6*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + B*(b*c - a*d)*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + 3*B*(b*c - a*d)^2*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + 3*B*(b*c - a*d)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/d^4 + (2*B*(b*c - a*d)^2*(24*A*b*d*(b*c - a*d)^3*x + 24*B*d*(b*c - a*d)^3*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] - 12*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 8*d^3*(b*c - a*d)*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 6*d^4*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 24*B*(b*c - a*d)^4*Log[c + d*x] - 24*(b*c - a*d)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + 4*B*(b*c - a*d)^2*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + B*(b*c - a*d)*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 + 2*d^3*(a + b*x)^3 - 6*(b*c - a*d)^3*Log[c + d*x]) + 12*B*(b*c - a*d)^3*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + 12*B*(b*c - a*d)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/d^4 - (B*(b*c - a*d)*(24*b^2*B*c*d*(b*c - a*d)^3*x + 120*A*b*d*(b*c - a*d)^4*x + 130*b*B*d*(b*c - a*d)^4*x + 24*a*b*B*d^2*(-(b*c) + a*d)^3*x - 12*b*B*c*d^2*(b*c - a*d)^2*(a + b*x)^2 + 12*a*B*d^3*(b*c - a*d)^2*(a + b*x)^2 + 35*B*d^2*(-(b*c) + a*d)^3*(a + b*x)^2 + 8*b*B*c*d^3*(b*c - a*d)*(a + b*x)^3 + 10*B*d^3*(b*c - a*d)^2*(a + b*x)^3 + 8*a*B*d^4*(-(b*c) + a*d)*(a + b*x)^3 - 6*b*B*c*d^4*(a + b*x)^4 + 6*a*B*d^5*(a + b*x)^4 + 120*B*d*(b*c - a*d)^4*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] + 60*d^2*(-(b*c) + a*d)^3*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 40*d^3*(b*c - a*d)^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 30*d^4*(-(b*c) + a*d)*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 24*d^5*(a + b*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 24*b*B*c*(b*c - a*d)^4*Log[c + d*x] + 24*a*B*d*(b*c - a*d)^4*Log[c + d*x] - 250*B*(b*c - a*d)^5*Log[c + d*x] - 120*(b*c - a*d)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + 60*B*(b*c - a*d)^5*((2*Log[(d*(
```

$(a + b*x)/(-b*c + a*d)] - \text{Log}[c + d*x]*\text{Log}[c + d*x] + 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d))]/(6*d^4))/(60*b^3)$

**Maple [F]** time = 3.027, size = 0, normalized size = 0.

$$\int (bgx + ag)^3 (dix + ci)^2 \left( A + B \ln \left( \frac{e(bx + a)}{dx + c} \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)`

[Out] `int((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)`

**Maxima [B]** time = 2.13798, size = 6990, normalized size = 9.83

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima")`

[Out]  $\frac{1}{6}A^2b^3d^2g^3i^2x^6 + \frac{2}{5}A^2b^3c*dg^3i^2x^5 + \frac{3}{5}A^2a*b^2*d^2g^3i^2x^5 + \frac{1}{4}A^2b^3c^2g^3i^2x^4 + \frac{3}{2}A^2a*b^2*c*dg^3i^2x^4 + \frac{3}{4}A^2a^2*b*d^2g^3i^2x^4 + A^2a*b^2*c^2g^3i^2x^3 + 2A^2a^2*b*c*dg^3i^2x^3 + \frac{1}{3}A^2a^3*d^2g^3i^2x^3 + \frac{3}{2}A^2a^2*b*c^2g^3i^2x^2 + A^2a^3*c*dg^3i^2x^2 + 2*(x*\log(b*e*x/(d*x + c)) + a*e/(d*x + c)) + a*\log(b*x + a)/b - c*\log(d*x + c)/d)*A*B*a^3*c^2g^3i^2 + 3*(x^2*\log(b*e*x/(d*x + c)) + a*e/(d*x + c)) - a^2*\log(b*x + a)/b^2 + c^2*\log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*a^2*b*c^2g^3i^2 + (2*x^3*\log(b*e*x/(d*x + c)) + a*e/(d*x + c)) + 2*a^3*\log(b*x + a)/b^3 - 2*c^3*\log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a*b^2*c^2g^3i^2 + \frac{1}{12}(6*x^4*\log(b*e*x/(d*x + c)) + a*e/(d*x + c)) - 6*a^4*\log(b*x + a)/b^4 + 6*c^4*\log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*b^3*c^2g^3i^2 + 2*(x^2*\log(b*e*x/(d*x + c)) + a*e/(d*x + c)) - a^2*\log(b*x + a)/b^2 + c^2*\log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*a^3*c*dg^3i^2 + 2*(2*x^3*\log(b*e*x/(d*x + c)) + a*e/(d*x + c)) + 2*a^3*\log(b*x + a)/b^3 - 2*c^3*\log(d*x$

$$\begin{aligned}
& + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) * \\
& A*B*a^2*b*c*d*g^3*i^2 + 1/2*(6*x^4*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6 \\
& *a^4*\log(b*x + a)/b^4 + 6*c^4*\log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3) \\
& *x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) * \\
& A*B*a*b^2*c*d*g^3*i^2 + 1/15*(12*x^5*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) + \\
& 12*a^5*\log(b*x + a)/b^5 - 12*c^5*\log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d \\
& ^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 \\
& - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4)) * A*B*b^3*c*d*g^3*i^2 + 1/3*(2*x^3* \\
& \log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*\log(b*x + a)/b^3 - 2*c^3*\log(d* \\
& x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) \\
& * A*B*a^3*d^2*g^3*i^2 + 1/4*(6*x^4*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6* \\
& a^4*\log(b*x + a)/b^4 + 6*c^4*\log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)* \\
& x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) * A \\
& * B*a^2*b*d^2*g^3*i^2 + 1/10*(12*x^5*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) + \\
& 12*a^5*\log(b*x + a)/b^5 - 12*c^5*\log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d \\
& ^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 \\
& - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4)) * A*B*a*b^2*d^2*g^3*i^2 + 1/180*(60*x \\
& ^6*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 60*a^6*\log(b*x + a)/b^6 + 60*c^6* \\
& \log(d*x + c)/d^6 - (12*(b^5*c*d^4 - a*b^4*d^5)*x^5 - 15*(b^5*c^2*d^3 - a^2* \\
& b^3*d^5)*x^4 + 20*(b^5*c^3*d^2 - a^3*b^2*d^5)*x^3 - 30*(b^5*c^4*d - a^4*b*d \\
& ^5)*x^2 + 60*(b^5*c^5 - a^5*d^5)*x)/(b^5*d^5)) * A*B*b^3*d^2*g^3*i^2 + A^2*a^ \\
& 3*c^2*g^3*i^2*x - 1/180*(33*a^4*b*c^2*d^4*g^3*i^2 - 6*a^5*c*d^5*g^3*i^2 - 2 \\
& *(3*g^3*i^2*\log(e) + g^3*i^2)*b^5*c^6 + 6*(6*g^3*i^2*\log(e) + g^3*i^2)*a*b^ \\
& 4*c^5*d - 3*(30*g^3*i^2*\log(e) - g^3*i^2)*a^2*b^3*c^4*d^2 + 2*(60*g^3*i^2* \\
& \log(e) - 17*g^3*i^2)*a^3*b^2*c^3*d^3)*B^2*\log(d*x + c)/(b^2*d^4) + 1/30*(b^6 \\
& *c^6*g^3*i^2 - 6*a*b^5*c^5*d*g^3*i^2 + 15*a^2*b^4*c^4*d^2*g^3*i^2 - 20*a^3* \\
& b^3*c^3*d^3*g^3*i^2 + 15*a^4*b^2*c^2*d^4*g^3*i^2 - 6*a^5*b*c*d^5*g^3*i^2 + \\
& a^6*d^6*g^3*i^2)*(\log(b*x + a)*\log((b*d*x + a*d)/(b*c - a*d) + 1) + \operatorname{dilog}(- \\
& (b*d*x + a*d)/(b*c - a*d))) * B^2/(b^3*d^4) + 1/360*(60*B^2*b^6*d^6*g^3*i^2*x \\
& ^6*\log(e)^2 + 24*((6*g^3*i^2*\log(e))^2 - g^3*i^2*\log(e))*b^6*c*d^5 + (9*g^3* \\
& i^2*\log(e)^2 + g^3*i^2*\log(e))*a*b^5*d^6)*B^2*x^5 + 6*((15*g^3*i^2*\log(e))^2 \\
& - 7*g^3*i^2*\log(e) + g^3*i^2)*b^6*c^2*d^4 + 2*(45*g^3*i^2*\log(e)^2 - 3*g^3 \\
& *i^2*\log(e) - g^3*i^2)*a*b^5*c*d^5 + (45*g^3*i^2*\log(e)^2 + 13*g^3*i^2*\log( \\
& e) + g^3*i^2)*a^2*b^4*d^6)*B^2*x^4 - 2*((2*g^3*i^2*\log(e) - 3*g^3*i^2)*b^6* \\
& c^3*d^3 - 3*(60*g^3*i^2*\log(e)^2 - 26*g^3*i^2*\log(e) + g^3*i^2)*a*b^5*c^2*d \\
& ^4 - 3*(120*g^3*i^2*\log(e)^2 + 14*g^3*i^2*\log(e) - 5*g^3*i^2)*a^2*b^4*c*d^5 \\
& - (60*g^3*i^2*\log(e)^2 + 38*g^3*i^2*\log(e) + 9*g^3*i^2)*a^3*b^3*d^6)*B^2*x \\
& ^3 + ((6*g^3*i^2*\log(e) - 7*g^3*i^2)*b^6*c^4*d^2 - 2*(18*g^3*i^2*\log(e) - 2 \\
& 3*g^3*i^2)*a*b^5*c^3*d^3 + 60*(9*g^3*i^2*\log(e)^2 - 3*g^3*i^2*\log(e) - g^3* \\
& i^2)*a^2*b^4*c^2*d^4 + 2*(180*g^3*i^2*\log(e)^2 + 102*g^3*i^2*\log(e) + 5*g^3 \\
& *i^2)*a^3*b^3*c*d^5 + (6*g^3*i^2*\log(e) + 11*g^3*i^2)*a^4*b^2*d^6)*B^2*x^2 \\
& - 2*(2*(3*g^3*i^2*\log(e) - 2*g^3*i^2)*b^6*c^5*d - 9*(4*g^3*i^2*\log(e) - 3*g \\
& ^3*i^2)*a*b^5*c^4*d^2 + (90*g^3*i^2*\log(e) - 77*g^3*i^2)*a^2*b^4*c^3*d^3 - \\
& (180*g^3*i^2*\log(e)^2 + 30*g^3*i^2*\log(e) - 97*g^3*i^2)*a^3*b^3*c^2*d^4 - 3 \\
& *(12*g^3*i^2*\log(e) + 17*g^3*i^2)*a^4*b^2*c*d^5 + 2*(3*g^3*i^2*\log(e) + 4*g
\end{aligned}$$



$$\begin{aligned}
&^3i^2) * a^5 * b * d^6) * B^2 * x + 6 * (10 * B^2 * b^6 * d^6 * g^3i^2 * x^6 + 60 * B^2 * a^3 * b^3 * c \\
&^2 * d^4 * g^3i^2 * x + 12 * (2 * b^6 * c * d^5 * g^3i^2 + 3 * a * b^5 * d^6 * g^3i^2) * B^2 * x^5 + \\
&15 * (b^6 * c^2 * d^4 * g^3i^2 + 6 * a * b^5 * c * d^5 * g^3i^2 + 3 * a^2 * b^4 * d^6 * g^3i^2) * B \\
&^2 * x^4 + 20 * (3 * a * b^5 * c^2 * d^4 * g^3i^2 + 6 * a^2 * b^4 * c * d^5 * g^3i^2 + a^3 * b^3 * d^ \\
&6 * g^3i^2) * B^2 * x^3 + 30 * (3 * a^2 * b^4 * c^2 * d^4 * g^3i^2 + 2 * a^3 * b^3 * c * d^5 * g^3i^ \\
&2) * B^2 * x^2 + (15 * a^4 * b^2 * c^2 * d^4 * g^3i^2 - 6 * a^5 * b * c * d^5 * g^3i^2 + a^6 * d^6 * g \\
&^3i^2) * B^2) * \log(b * x + a)^2 + 6 * (10 * B^2 * b^6 * d^6 * g^3i^2 * x^6 + 60 * B^2 * a^3 * b \\
&^3 * c^2 * d^4 * g^3i^2 * x + 12 * (2 * b^6 * c * d^5 * g^3i^2 + 3 * a * b^5 * d^6 * g^3i^2) * B^2 * x \\
&^5 + 15 * (b^6 * c^2 * d^4 * g^3i^2 + 6 * a * b^5 * c * d^5 * g^3i^2 + 3 * a^2 * b^4 * d^6 * g^3i^ \\
&2) * B^2 * x^4 + 20 * (3 * a * b^5 * c^2 * d^4 * g^3i^2 + 6 * a^2 * b^4 * c * d^5 * g^3i^2 + a^3 * b^ \\
&3 * d^6 * g^3i^2) * B^2 * x^3 + 30 * (3 * a^2 * b^4 * c^2 * d^4 * g^3i^2 + 2 * a^3 * b^3 * c * d^5 * g^ \\
&3 * i^2) * B^2 * x^2 - (b^6 * c^6 * g^3i^2 - 6 * a * b^5 * c^5 * d * g^3i^2 + 15 * a^2 * b^4 * c^4 * \\
&d^2 * g^3i^2 - 20 * a^3 * b^3 * c^3 * d^3 * g^3i^2) * B^2) * \log(d * x + c)^2 + 2 * (60 * B^2 * b \\
&^6 * d^6 * g^3i^2 * x^6 * \log(e) + 12 * ((12 * g^3i^2 * \log(e) - g^3i^2) * b^6 * c * d^5 + ( \\
&18 * g^3i^2 * \log(e) + g^3i^2) * a * b^5 * d^6) * B^2 * x^5 + 3 * ((30 * g^3i^2 * \log(e) - 7 \\
&* g^3i^2) * b^6 * c^2 * d^4 + 6 * (30 * g^3i^2 * \log(e) - g^3i^2) * a * b^5 * c * d^5 + (90 * g \\
&^3i^2 * \log(e) + 13 * g^3i^2) * a^2 * b^4 * d^6) * B^2 * x^4 - 2 * (b^6 * c^3 * d^3 * g^3i^2 - \\
&3 * (60 * g^3i^2 * \log(e) - 13 * g^3i^2) * a * b^5 * c^2 * d^4 - 3 * (120 * g^3i^2 * \log(e) + \\
&7 * g^3i^2) * a^2 * b^4 * c * d^5 - (60 * g^3i^2 * \log(e) + 19 * g^3i^2) * a^3 * b^3 * d^6) * B \\
&^2 * x^3 + 3 * (b^6 * c^4 * d^2 * g^3i^2 - 6 * a * b^5 * c^3 * d^3 * g^3i^2 + a^4 * b^2 * d^6 * g^3 \\
&* i^2 + 30 * (6 * g^3i^2 * \log(e) - g^3i^2) * a^2 * b^4 * c^2 * d^4 + 2 * (60 * g^3i^2 * \log( \\
&e) + 17 * g^3i^2) * a^3 * b^3 * c * d^5) * B^2 * x^2 - 6 * (b^6 * c^5 * d * g^3i^2 - 6 * a * b^5 * c^ \\
&4 * d^2 * g^3i^2 + 15 * a^2 * b^4 * c^3 * d^3 * g^3i^2 - 6 * a^4 * b^2 * c * d^5 * g^3i^2 + a^5 * \\
&b * d^6 * g^3i^2 - 5 * (12 * g^3i^2 * \log(e) + g^3i^2) * a^3 * b^3 * c^2 * d^4) * B^2 * x - (6 \\
&* a * b^5 * c^5 * d * g^3i^2 - 33 * a^2 * b^4 * c^4 * d^2 * g^3i^2 + 74 * a^3 * b^3 * c^3 * d^3 * g^3i \\
&^2 - 9 * (10 * g^3i^2 * \log(e) + 7 * g^3i^2) * a^4 * b^2 * c^2 * d^4 + 18 * (2 * g^3i^2 * \log \\
&(e) + g^3i^2) * a^5 * b * c * d^5 - 2 * (3 * g^3i^2 * \log(e) + g^3i^2) * a^6 * d^6) * B^2) * \log \\
&(b * x + a) - 2 * (60 * B^2 * b^6 * d^6 * g^3i^2 * x^6 * \log(e) + 12 * ((12 * g^3i^2 * \log(e) \\
&- g^3i^2) * b^6 * c * d^5 + (18 * g^3i^2 * \log(e) + g^3i^2) * a * b^5 * d^6) * B^2 * x^5 + \\
&3 * ((30 * g^3i^2 * \log(e) - 7 * g^3i^2) * b^6 * c^2 * d^4 + 6 * (30 * g^3i^2 * \log(e) - g^3 \\
&i^2) * a * b^5 * c * d^5 + (90 * g^3i^2 * \log(e) + 13 * g^3i^2) * a^2 * b^4 * d^6) * B^2 * x^4 - \\
&2 * (b^6 * c^3 * d^3 * g^3i^2 - 3 * (60 * g^3i^2 * \log(e) - 13 * g^3i^2) * a * b^5 * c^2 * d^4 \\
&- 3 * (120 * g^3i^2 * \log(e) + 7 * g^3i^2) * a^2 * b^4 * c * d^5 - (60 * g^3i^2 * \log(e) + 1 \\
&9 * g^3i^2) * a^3 * b^3 * d^6) * B^2 * x^3 + 3 * (b^6 * c^4 * d^2 * g^3i^2 - 6 * a * b^5 * c^3 * d^3 * \\
&g^3i^2 + a^4 * b^2 * d^6 * g^3i^2 + 30 * (6 * g^3i^2 * \log(e) - g^3i^2) * a^2 * b^4 * c^2 \\
&* d^4 + 2 * (60 * g^3i^2 * \log(e) + 17 * g^3i^2) * a^3 * b^3 * c * d^5) * B^2 * x^2 - 6 * (b^6 * c \\
&^5 * d * g^3i^2 - 6 * a * b^5 * c^4 * d^2 * g^3i^2 + 15 * a^2 * b^4 * c^3 * d^3 * g^3i^2 - 6 * a^4 \\
&* b^2 * c * d^5 * g^3i^2 + a^5 * b * d^6 * g^3i^2 - 5 * (12 * g^3i^2 * \log(e) + g^3i^2) * a^ \\
&3 * b^3 * c^2 * d^4) * B^2 * x + 6 * (10 * B^2 * b^6 * d^6 * g^3i^2 * x^6 + 60 * B^2 * a^3 * b^3 * c^2 * d \\
&^4 * g^3i^2 * x + 12 * (2 * b^6 * c * d^5 * g^3i^2 + 3 * a * b^5 * d^6 * g^3i^2) * B^2 * x^5 + 15 * \\
&(b^6 * c^2 * d^4 * g^3i^2 + 6 * a * b^5 * c * d^5 * g^3i^2 + 3 * a^2 * b^4 * d^6 * g^3i^2) * B^2 * x \\
&^4 + 20 * (3 * a * b^5 * c^2 * d^4 * g^3i^2 + 6 * a^2 * b^4 * c * d^5 * g^3i^2 + a^3 * b^3 * d^6 * g^ \\
&3 * i^2) * B^2 * x^3 + 30 * (3 * a^2 * b^4 * c^2 * d^4 * g^3i^2 + 2 * a^3 * b^3 * c * d^5 * g^3i^2) * B \\
&^2 * x^2 + (15 * a^4 * b^2 * c^2 * d^4 * g^3i^2 - 6 * a^5 * b * c * d^5 * g^3i^2 + a^6 * d^6 * g^3i \\
&^2) * B^2) * \log(b * x + a) * \log(d * x + c)) / (b^3 * d^4)
\end{aligned}$$

---

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( A^2 b^3 d^2 g^3 i^2 x^5 + A^2 a^3 c^2 g^3 i^2 + (2 A^2 b^3 c d + 3 A^2 a b^2 d^2) g^3 i^2 x^4 + (A^2 b^3 c^2 + 6 A^2 a b^2 c d + 3 A^2 a^2 b d^2) g^3 i^2 x^3 + (3 A^2 a^3 c^2 d + 6 A^2 a^2 b c d^2 + 3 A^2 a b^2 c d^2 + 3 A^2 a^2 b^2 c d^2) g^3 i^2 x^2 + (3 A^2 a^3 c^2 d + 6 A^2 a^2 b c d^2 + 3 A^2 a b^2 c d^2 + 3 A^2 a^2 b^2 c d^2) g^3 i^2 x + (3 A^2 a^3 c^2 d + 6 A^2 a^2 b c d^2 + 3 A^2 a b^2 c d^2 + 3 A^2 a^2 b^2 c d^2) g^3 i^2 + (3 A^2 a^3 c^2 d + 6 A^2 a^2 b c d^2 + 3 A^2 a b^2 c d^2 + 3 A^2 a^2 b^2 c d^2) g^3 i + (3 A^2 a^3 c^2 d + 6 A^2 a^2 b c d^2 + 3 A^2 a b^2 c d^2 + 3 A^2 a^2 b^2 c d^2) g^3 + (3 A^2 a^3 c^2 d + 6 A^2 a^2 b c d^2 + 3 A^2 a b^2 c d^2 + 3 A^2 a^2 b^2 c d^2) g^2 + (3 A^2 a^3 c^2 d + 6 A^2 a^2 b c d^2 + 3 A^2 a b^2 c d^2 + 3 A^2 a^2 b^2 c d^2) g + (3 A^2 a^3 c^2 d + 6 A^2 a^2 b c d^2 + 3 A^2 a b^2 c d^2 + 3 A^2 a^2 b^2 c d^2) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(d\*i\*x+c\*i)^2\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2,x, algorithm="fricas")

[Out] integral(A^2\*b^3\*d^2\*g^3\*i^2\*x^5 + A^2\*a^3\*c^2\*g^3\*i^2 + (2\*A^2\*b^3\*c\*d + 3\*A^2\*a\*b^2\*d^2)\*g^3\*i^2\*x^4 + (A^2\*b^3\*c^2 + 6\*A^2\*a\*b^2\*c\*d + 3\*A^2\*a^2\*b\*d^2)\*g^3\*i^2\*x^3 + (3\*A^2\*a\*b^2\*c^2 + 6\*A^2\*a^2\*b\*c\*d + A^2\*a^3\*d^2)\*g^3\*i^2\*x^2 + (3\*A^2\*a^2\*b\*c^2 + 2\*A^2\*a^3\*c\*d)\*g^3\*i^2\*x + (B^2\*b^3\*d^2\*g^3\*i^2\*x^5 + B^2\*a^3\*c^2\*g^3\*i^2 + (2\*B^2\*b^3\*c\*d + 3\*B^2\*a\*b^2\*d^2)\*g^3\*i^2\*x^4 + (B^2\*b^3\*c^2 + 6\*B^2\*a\*b^2\*c\*d + 3\*B^2\*a^2\*b\*d^2)\*g^3\*i^2\*x^3 + (3\*B^2\*a\*b^2\*c^2 + 6\*B^2\*a^2\*b\*c\*d + B^2\*a^3\*d^2)\*g^3\*i^2\*x^2 + (3\*B^2\*a^2\*b\*c^2 + 2\*B^2\*a^3\*c\*d)\*g^3\*i^2\*x)\*log((b\*e\*x + a\*e)/(d\*x + c))^2 + 2\*(A\*B\*b^3\*d^2\*g^3\*i^2\*x^5 + A\*B\*a^3\*c^2\*g^3\*i^2 + (2\*A\*B\*b^3\*c\*d + 3\*A\*B\*a\*b^2\*d^2)\*g^3\*i^2\*x^4 + (A\*B\*b^3\*c^2 + 6\*A\*B\*a\*b^2\*c\*d + 3\*A\*B\*a^2\*b\*d^2)\*g^3\*i^2\*x^3 + (3\*A\*B\*a\*b^2\*c^2 + 6\*A\*B\*a^2\*b\*c\*d + A\*B\*a^3\*d^2)\*g^3\*i^2\*x^2 + (3\*A\*B\*a^2\*b\*c^2 + 2\*A\*B\*a^3\*c\*d)\*g^3\*i^2\*x)\*log((b\*e\*x + a\*e)/(d\*x + c)), x)

---

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*\*3\*(d\*i\*x+c\*i)\*\*2\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))\*\*2,x)

[Out] Timed out

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int (bgx + ag)^3 (dix + ci)^2 \left( B \log \left( \frac{(bx + a)e}{dx + c} \right) + A \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(d*i*x + c*i)^2*(B*log((b*x + a)*e/(d*x + c)) + A)^2, x)
```

$$3.65 \quad \int (ag + bgx)^2 (ci + dix)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx$$

**Optimal.** Leaf size=761

$$\frac{B^2 g^2 i^2 (bc - ad)^5 \text{PolyLog} \left( 2, \frac{d(a+bx)}{b(c+dx)} \right)}{15b^3 d^3} + \frac{B g^2 i^2 (bc - ad)^5 \log \left( \frac{bc-ad}{b(c+dx)} \right) \left( 2B \log \left( \frac{e(a+bx)}{c+dx} \right) + 2A + 3B \right)}{30b^3 d^3} + \frac{B g^2 i^2 (a + bx)(bc - ad)}{15b^3 d^3}$$

```
[Out] -(B^2*(b*c - a*d)^4*g^2*i^2*x)/(10*b^2*d^2) - (B^2*(b*c - a*d)^3*g^2*i^2*(c + d*x)^2)/(20*b*d^3) + (B^2*(b*c - a*d)^2*g^2*i^2*(c + d*x)^3)/(30*d^3) + (B^2*(b*c - a*d)^5*g^2*i^2*Log[(a + b*x)/(c + d*x)])/(30*b^3*d^3) - (B*(b*c - a*d)^3*g^2*i^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(30*b^3*d) - (B*(b*c - a*d)^2*g^2*i^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(15*b^3) - (B*(b*c - a*d)^3*g^2*i^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(5*b*d^3) + (4*B*(b*c - a*d)^2*g^2*i^2*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(15*d^3) - (b*B*(b*c - a*d)*g^2*i^2*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(10*d^3) + ((b*c - a*d)^2*g^2*i^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2)/(30*b^3) + ((b*c - a*d)*g^2*i^2*(a + b*x)^3*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2)/(10*b^2) + (g^2*i^2*(a + b*x)^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2)/(5*b) + (B*(b*c - a*d)^4*g^2*i^2*(a + b*x)*(2*A + B + 2*B*Log[(e*(a + b*x))/(c + d*x)]))/(30*b^3*d^2) + (B*(b*c - a*d)^5*g^2*i^2*Log[(b*c - a*d)/(b*(c + d*x))]*(2*A + 3*B + 2*B*Log[(e*(a + b*x))/(c + d*x)]))/(30*b^3*d^3) + (B^2*(b*c - a*d)^5*g^2*i^2*Log[c + d*x]/(10*b^3*d^3) + (B^2*(b*c - a*d)^5*g^2*i^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))]/(15*b^3*d^3)
```

**Rubi [A]** time = 2.39625, antiderivative size = 666, normalized size of antiderivative = 0.88, number of steps used = 74, number of rules used = 13, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.31$ , Rules used = {2528, 2525, 12, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{B^2 g^2 i^2 (bc - ad)^5 \text{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right)}{15b^3 d^3} - \frac{B g^2 i^2 (bc - ad)^5 \log(c + dx) \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{15b^3 d^3} + \frac{d^2 g^2 i^2 (a + bx)^5 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{5b^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2, x]
```

```
[Out] (A*B*(b*c - a*d)^4*g^2*i^2*x)/(15*b^2*d^2) - (B^2*(b*c - a*d)^4*g^2*i^2*x)/(15*b^2*d^2) + (B^2*(b*c - a*d)^3*g^2*i^2*(a + b*x)^2)/(20*b^3*d) + (B^2*(b
```

$$\begin{aligned} & *c - a*d)^2*g^2*i^2*(a + b*x)^3)/(30*b^3) + (B^2*(b*c - a*d)^4*g^2*i^2*(a + \\ & b*x)*\text{Log}[(e*(a + b*x))/(c + d*x)]/(15*b^3*d^2) - (B*(b*c - a*d)^3*g^2*i^2 \\ & *(a + b*x)^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(30*b^3*d) - (B*(b*c - a \\ & *d)^2*g^2*i^2*(a + b*x)^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(5*b^3) - ( \\ & B*d*(b*c - a*d)*g^2*i^2*(a + b*x)^4*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/( \\ & 10*b^3) + ((b*c - a*d)^2*g^2*i^2*(a + b*x)^3*(A + B*\text{Log}[(e*(a + b*x))/(c + \\ & d*x)])^2)/(3*b^3) + (d*(b*c - a*d)*g^2*i^2*(a + b*x)^4*(A + B*\text{Log}[(e*(a + b \\ & *x))/(c + d*x)])^2)/(2*b^3) + (d^2*g^2*i^2*(a + b*x)^5*(A + B*\text{Log}[(e*(a + b \\ & *x))/(c + d*x)])^2)/(5*b^3) + (B^2*(b*c - a*d)^5*g^2*i^2*\text{Log}[-((d*(a + b*x) \\ & )/(b*c - a*d))]*\text{Log}[c + d*x])/(15*b^3*d^3) - (B*(b*c - a*d)^5*g^2*i^2*(A + \\ & B*\text{Log}[(e*(a + b*x))/(c + d*x)]*\text{Log}[c + d*x])/(15*b^3*d^3) - (B^2*(b*c - a* \\ & d)^5*g^2*i^2*\text{Log}[c + d*x]^2)/(30*b^3*d^3) + (B^2*(b*c - a*d)^5*g^2*i^2*\text{Poly} \\ & \text{Log}[2, (b*(c + d*x))/(b*c - a*d)]/(15*b^3*d^3) \end{aligned}$$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_.))^(p_.)*((c_.) + (d_.)*(x_.))^(q_.))
^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q]^r]^s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

### Rule 31

```
Int[((a_) + (b_)*(x_))^-1), x_Symbol] := Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

### Rule 43

```
Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_), x_Symbol] := Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

### Rule 2524

```
Int[((a_) + Log[(c_)*(Rfx_)^(p_)]*(b_))^(n_)/((d_) + (e_)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_))^(n_)]*(b_))^(p_)*(Rfx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, Rfx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
Rfx, x] && IntegerQ[p]
```

### Rule 2394

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_))^(n_)]*(b_))/((f_) + (g_)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

### Rule 2393

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_))]*(b_))/((f_) + (g_)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_)*((d_) + (e_)*(x_))^(n_)]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rubi steps

$$\begin{aligned}
\int (65c + 65dx)^2 (ag + bgx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx &= \int \left( \frac{(-bc + ad)^2 g^2 (65c + 65dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d^2} - \frac{2b(65c + 65dx)^2 (ag + bgx)^2}{d} \right) dx \\
&= \frac{(b^2 g^2) \int (65c + 65dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{4225 d^2} - \frac{2b(65c + 65dx)^2 (ag + bgx)^2}{d} \\
&= \frac{4225(bc - ad)^2 g^2 (c + dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{3d^3} - \frac{4225b(bc - ad)^2 g^2 (c + dx)^2 (ag + bgx)^2}{3d^3} \\
&= \frac{4225(bc - ad)^2 g^2 (c + dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{3d^3} - \frac{4225b(bc - ad)^2 g^2 (c + dx)^2 (ag + bgx)^2}{3d^3} \\
&= \frac{4225(bc - ad)^2 g^2 (c + dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{3d^3} - \frac{4225b(bc - ad)^2 g^2 (c + dx)^2 (ag + bgx)^2}{3d^3} \\
&= \frac{4225(bc - ad)^2 g^2 (c + dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{3d^3} - \frac{4225b(bc - ad)^2 g^2 (c + dx)^2 (ag + bgx)^2}{3d^3} \\
&= -\frac{845AB(bc - ad)^4 g^2 x}{3b^2 d^2} - \frac{845B(bc - ad)^3 g^2 (c + dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{6bd^3} \\
&= -\frac{845AB(bc - ad)^4 g^2 x}{3b^2 d^2} - \frac{845B^2(bc - ad)^4 g^2 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)^2}{3b^3 d^2} \\
&= -\frac{845AB(bc - ad)^4 g^2 x}{3b^2 d^2} - \frac{845B^2(bc - ad)^4 g^2 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)^2}{3b^3 d^2} \\
&= -\frac{845AB(bc - ad)^4 g^2 x}{3b^2 d^2} - \frac{845B^2(bc - ad)^4 g^2 x}{3b^2 d^2} - \frac{845B^2(bc - ad)^4 g^2 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)^2}{4b^3 d^2} \\
&= -\frac{845AB(bc - ad)^4 g^2 x}{3b^2 d^2} - \frac{845B^2(bc - ad)^4 g^2 x}{3b^2 d^2} - \frac{845B^2(bc - ad)^4 g^2 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)^2}{4b^3 d^2} \\
&= -\frac{845AB(bc - ad)^4 g^2 x}{3b^2 d^2} - \frac{845B^2(bc - ad)^4 g^2 x}{3b^2 d^2} - \frac{845B^2(bc - ad)^4 g^2 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)^2}{4b^3 d^2} \\
&= -\frac{845AB(bc - ad)^4 g^2 x}{3b^2 d^2} - \frac{845B^2(bc - ad)^4 g^2 x}{3b^2 d^2} - \frac{845B^2(bc - ad)^4 g^2 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)^2}{4b^3 d^2}
\end{aligned}$$



**Mathematica [A]** time = 0.913887, size = 1194, normalized size = 1.57

$$g^2 i^2 \left( 12d^5 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 (a+bx)^5 + 30d^4(bc-ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 (a+bx)^4 + 20d^3(bc-ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 (a+bx)^3 + 30d^2(bc-ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 (a+bx)^2 + 20d(bc-ad)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 (a+bx) + 12d^5(bc-ad)^5 \right)$$

Antiderivative was successfully verified.

[In] Integrate[(a\*g + b\*g\*x)^2\*(c\*i + d\*i\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2,x]

[Out] (g^2\*i^2\*(20\*d^3\*(b\*c - a\*d)^2\*(a + b\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2 + 30\*d^4\*(b\*c - a\*d)\*(a + b\*x)^4\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2 + 12\*d^5\*(a + b\*x)^5\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2 + 20\*B\*(b\*c - a\*d)^3\*(2\*A\*b\*d\*(b\*c - a\*d)\*x + 2\*B\*d\*(b\*c - a\*d)\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x)] - d^2\*(a + b\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) - 2\*B\*(b\*c - a\*d)^2\*Log[c + d\*x] - 2\*(b\*c - a\*d)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])\*Log[c + d\*x] + B\*(b\*c - a\*d)\*(b\*d\*x + (-b\*c) + a\*d)\*Log[c + d\*x] + B\*(b\*c - a\*d)^2\*((2\*Log[(d\*(a + b\*x))/(-b\*c) + a\*d]) - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)]) - 10\*B\*(b\*c - a\*d)^2\*(6\*A\*b\*d\*(b\*c - a\*d)^2\*x + 6\*B\*d\*(b\*c - a\*d)^2\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x)] + 3\*d^2\*(-b\*c) + a\*d)\*(a + b\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) + 2\*d^3\*(a + b\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) - 6\*B\*(b\*c - a\*d)^3\*Log[c + d\*x] - 6\*(b\*c - a\*d)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])\*Log[c + d\*x] + B\*(b\*c - a\*d)\*(2\*b\*d\*(b\*c - a\*d)\*x - d^2\*(a + b\*x)^2 - 2\*(b\*c - a\*d)^2\*Log[c + d\*x]) + 3\*B\*(b\*c - a\*d)^2\*(b\*d\*x + (-b\*c) + a\*d)\*Log[c + d\*x] + 3\*B\*(b\*c - a\*d)^3\*((2\*Log[(d\*(a + b\*x))/(-b\*c) + a\*d]) - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)]) + B\*(b\*c - a\*d)\*(24\*A\*b\*d\*(b\*c - a\*d)^3\*x + 24\*B\*d\*(b\*c - a\*d)^3\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x)] - 12\*d^2\*(b\*c - a\*d)^2\*(a + b\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) + 8\*d^3\*(b\*c - a\*d)\*(a + b\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) - 6\*d^4\*(a + b\*x)^4\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) - 24\*B\*(b\*c - a\*d)^4\*Log[c + d\*x] - 24\*(b\*c - a\*d)^4\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])\*Log[c + d\*x] + 4\*B\*(b\*c - a\*d)^2\*(2\*b\*d\*(b\*c - a\*d)\*x - d^2\*(a + b\*x)^2 - 2\*(b\*c - a\*d)^2\*Log[c + d\*x]) + B\*(b\*c - a\*d)\*(6\*b\*d\*(b\*c - a\*d)^2\*x + 3\*d^2\*(-b\*c) + a\*d)\*(a + b\*x)^2 + 2\*d^3\*(a + b\*x)^3 - 6\*(b\*c - a\*d)^3\*Log[c + d\*x] + 12\*B\*(b\*c - a\*d)^3\*(b\*d\*x + (-b\*c) + a\*d)\*Log[c + d\*x] + 12\*B\*(b\*c - a\*d)^4\*((2\*Log[(d\*(a + b\*x))/(-b\*c) + a\*d]) - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])))/(60\*b^3\*d^3)

**Maple [F]** time = 2.686, size = 0, normalized size = 0.

$$\int (bgx + ag)^2 (dix + ci)^2 \left( A + B \ln \left( \frac{e(bx + a)}{dx + c} \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)^2\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2,x)

[Out] int((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)^2\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2,x)

**Maxima [B]** time = 1.97522, size = 4936, normalized size = 6.49

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)^2\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2,x, algorithm="maxima")

[Out]  $\frac{1}{5}A^2b^2d^2g^2i^2x^5 + \frac{1}{2}A^2b^2c^2d^2g^2i^2x^4 + \frac{1}{2}A^2ab^2d^2g^2i^2x^4 + \frac{1}{3}A^2b^2c^2g^2i^2x^3 + \frac{4}{3}A^2ab^2c^2d^2g^2i^2x^3 + \frac{1}{3}A^2a^2d^2g^2i^2x^3 + A^2ab^2c^2g^2i^2x^2 + A^2a^2c^2d^2g^2i^2x^2 + 2*(x*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) + a*\log(b*x + a)/b - c*\log(d*x + c)/d)*A*B*a^2*c^2*g^2i^2 + 2*(x^2*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*\log(b*x + a)/b^2 + c^2*\log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*a^2*c^2*g^2i^2 + \frac{1}{3}*(2*x^3*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*\log(b*x + a)/b^3 - 2*c^3*\log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*b^2*c^2*g^2i^2 + 2*(x^2*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*\log(b*x + a)/b^2 + c^2*\log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*a^2*c^2*d^2*g^2i^2 + \frac{4}{3}*(2*x^3*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*\log(b*x + a)/b^3 - 2*c^3*\log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a^2*c^2*d^2*g^2i^2 + \frac{1}{6}*(6*x^4*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*\log(b*x + a)/b^4 + 6*c^4*\log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*b^2*c^2*d^2*g^2i^2 + \frac{1}{3}*(2*x^3*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*\log(b*x + a)/b^3 - 2*c^3*\log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a^2*d^2*g^2i^2 + \frac{1}{6}*(6*x^4*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*\log(b*x + a)/b^4 + 6*c^4*\log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*b^2*c^2*d^2*g^2i^2$

$$\begin{aligned}
& ^3d^3)) * A * B * a * b * d^2 * g^{2i} + 1/30 * (12 * x^5 * \log(b * e * x / (d * x + c)) + a * e / (d * x \\
& + c)) + 12 * a^5 * \log(b * x + a) / b^5 - 12 * c^5 * \log(d * x + c) / d^5 - (3 * (b^4 * c * d^3 - \\
& a * b^3 * d^4) * x^4 - 4 * (b^4 * c^2 * d^2 - a^2 * b^2 * d^4) * x^3 + 6 * (b^4 * c^3 * d - a^3 * b * \\
& d^4) * x^2 - 12 * (b^4 * c^4 - a^4 * d^4) * x) / (b^4 * d^4)) * A * B * b^2 * d^2 * g^{2i} + A^2 * a \\
& ^2 * c^2 * g^{2i} * x - 1/30 * (2 * b^4 * c^5 * g^{2i} * \log(e) + 9 * a^3 * b * c^2 * d^3 * g^{2i} \\
& - 2 * a^4 * c * d^4 * g^{2i} - 2 * (5 * g^{2i} * \log(e) - g^{2i}) * a * b^3 * c^4 * d + (20 * g \\
& ^{2i} * \log(e) - 9 * g^{2i}) * a^2 * b^2 * c^3 * d^2) * B^2 * \log(d * x + c) / (b^2 * d^3) - 1/ \\
& 15 * (b^5 * c^5 * g^{2i} - 5 * a * b^4 * c^4 * d * g^{2i} + 10 * a^2 * b^3 * c^3 * d^2 * g^{2i} - \\
& 10 * a^3 * b^2 * c^2 * d^3 * g^{2i} + 5 * a^4 * b * c * d^4 * g^{2i} - a^5 * d^5 * g^{2i}) * (\log( \\
& b * x + a) * \log((b * d * x + a * d) / (b * c - a * d)) + 1) + \text{dilog}(-(b * d * x + a * d) / (b * c - a \\
& * d)) * B^2 / (b^3 * d^3) + 1/60 * (12 * B^2 * b^5 * d^5 * g^{2i} * x^5 * \log(e)^2 + 6 * ((5 * g^{2i} \\
& * \log(e)^2 - g^{2i} * \log(e)) * b^5 * c * d^4 + (5 * g^{2i} * \log(e)^2 + g^{2i} * \log(e) * a * b^4 * d^5) * B^2 * x^4 + 2 * ((10 * g^{2i} * \log(e)^2 - 6 * g^{2i} * \log(e) + g^{2i} * \log(e)^2) * b^5 * c^2 * d^3 + 2 * (20 * g^{2i} * \log(e)^2 - g^{2i} * \log(e)) * a * b^4 * c * d^4 + (10 * g^{2i} * \log(e)^2 + 6 * g^{2i} * \log(e) + g^{2i} * \log(e)) * a^2 * b^3 * d^5) * B^2 * x^3 - ((2 * g^{2i} * \log(e) - 3 * g^{2i}) * b^5 * c^3 * d^2 - 3 * (20 * g^{2i} * \log(e)^2 - 10 * g^{2i} * \log(e) - g^{2i} * \log(e)) * a * b^4 * c^2 * d^3 - 3 * (20 * g^{2i} * \log(e)^2 + 10 * g^{2i} * \log(e) - g^{2i} * \log(e)) * a^2 * b^3 * c * d^4 - (2 * g^{2i} * \log(e) + 3 * g^{2i}) * a^3 * b^2 * d^5) * B^2 * x^2 + 2 * (2 * (g^{2i} * \log(e) - g^{2i}) * b^5 * c^4 * d - (10 * g^{2i} * \log(e) - 11 * g^{2i}) * a * b^4 * c^3 * d^2 + 6 * (5 * g^{2i} * \log(e)^2 - 3 * g^{2i}) * a^2 * b^3 * c^2 * d^3 + (10 * g^{2i} * \log(e) + 11 * g^{2i}) * a^3 * b^2 * c * d^4 - 2 * (g^{2i} * \log(e) + g^{2i} * \log(e)^2) * a^4 * b * d^5) * B^2 * x + 2 * (6 * B^2 * b^5 * d^5 * g^{2i} * x^5 + 30 * B^2 * a^2 * b^3 * c^2 * d^3 * g^{2i} * x + 15 * (b^5 * c * d^4 * g^{2i} + a * b^4 * d^5 * g^{2i}) * B^2 * x^4 + 10 * (b^5 * c^2 * d^3 * g^{2i} + 4 * a * b^4 * c * d^4 * g^{2i} + a^2 * b^3 * d^5 * g^{2i}) * B^2 * x^3 + 30 * (a * b^4 * c^2 * d^3 * g^{2i} + a^2 * b^3 * c * d^4 * g^{2i}) * B^2 * x^2 + (10 * a^3 * b^2 * c^2 * d^3 * g^{2i} - 5 * a^4 * b * c * d^4 * g^{2i} + a^5 * d^5 * g^{2i}) * B^2) * \log(b * x + a) ^2 + 2 * (6 * B^2 * b^5 * d^5 * g^{2i} * x^5 + 30 * B^2 * a^2 * b^3 * c^2 * d^3 * g^{2i} * x + 15 * (b^5 * c * d^4 * g^{2i} + a * b^4 * d^5 * g^{2i}) * B^2 * x^4 + 10 * (b^5 * c^2 * d^3 * g^{2i} + 4 * a * b^4 * c * d^4 * g^{2i} + a^2 * b^3 * d^5 * g^{2i}) * B^2 * x^3 + 30 * (a * b^4 * c^2 * d^3 * g^{2i} + a^2 * b^3 * c * d^4 * g^{2i}) * B^2 * x^2 + (b^5 * c^5 * g^{2i} - 5 * a * b^4 * c^4 * d * g^{2i} + 10 * a^2 * b^3 * c^3 * d^2 * g^{2i}) * B^2) * \log(d * x + c) ^2 + 2 * (12 * B^2 * b^5 * d^5 * g^{2i} * x^5 * \log(e) + 3 * ((10 * g^{2i} * \log(e) - g^{2i}) * b^5 * c * d^4 + (10 * g^{2i} * \log(e) + g^{2i}) * a * b^4 * d^5) * B^2 * x^4 + 2 * (40 * a * b^4 * c * d^4 * g^{2i} * \log(e) + (10 * g^{2i} * \log(e) - 3 * g^{2i}) * b^5 * c^2 * d^3 + (10 * g^{2i} * \log(e) + 3 * g^{2i}) * a^2 * b^3 * d^5) * B^2 * x^3 - (b^5 * c^3 * d^2 * g^{2i} - a^3 * b^2 * d^5 * g^{2i} - 15 * (4 * g^{2i} * \log(e) - g^{2i}) * a * b^4 * c^2 * d^3 - 15 * (4 * g^{2i} * \log(e) + g^{2i} * \log(e)^2) * a^2 * b^3 * c * d^4) * B^2 * x^2 + 2 * (30 * a^2 * b^3 * c^2 * d^3 * g^{2i} * \log(e) + b^5 * c^4 * d * g^{2i} - 5 * a * b^4 * c^3 * d^2 * g^{2i} + 5 * a^3 * b^2 * c * d^4 * g^{2i} - a^4 * b * d^5 * g^{2i}) * B^2 * x + (2 * a^5 * d^5 * g^{2i} * \log(e) + 2 * a * b^4 * c^4 * d * g^{2i} - 9 * a^2 * b^3 * c^3 * d^2 * g^{2i} + (20 * g^{2i} * \log(e) + 9 * g^{2i}) * a^3 * b^2 * c^2 * d^3 - 2 * (5 * g^{2i} * \log(e) + g^{2i} * \log(e)) * a^4 * b * c * d^4) * B^2) * \log(b * x + a) - 2 * (12 * B^2 * b^5 * d^5 * g^{2i} * x^5 * \log(e) + 3 * ((10 * g^{2i} * \log(e) - g^{2i}) * b^5 * c * d^4 + (10 * g^{2i} * \log(e) + g^{2i} * \log(e)) * a * b^4 * d^5) * B^2 * x^4 + 2 * (40 * a * b^4 * c * d^4 * g^{2i} * \log(e) + (10 * g^{2i} * \log(e) - 3 * g^{2i}) * b^5 * c^2 * d^3 + (10 * g^{2i} * \log(e) + 3 * g^{2i}) * a^2 * b^3 * d^5) * B^2 * x^3 - (b^5 * c^3 * d^2 * g^{2i} - a^3 * b^2 * d^5 * g^{2i}
\end{aligned}$$

$$- 15*(4*g^2*i^2*\log(e) - g^2*i^2)*a*b^4*c^2*d^3 - 15*(4*g^2*i^2*\log(e) + g^2*i^2)*a^2*b^3*c*d^4)*B^2*x^2 + 2*(30*a^2*b^3*c^2*d^3*g^2*i^2*\log(e) + b^5*c^4*d*g^2*i^2 - 5*a*b^4*c^3*d^2*g^2*i^2 + 5*a^3*b^2*c*d^4*g^2*i^2 - a^4*b*d^5*g^2*i^2)*B^2*x + 2*(6*B^2*b^5*d^5*g^2*i^2*x^5 + 30*B^2*a^2*b^3*c^2*d^3*g^2*i^2*x + 15*(b^5*c*d^4*g^2*i^2 + a*b^4*d^5*g^2*i^2)*B^2*x^4 + 10*(b^5*c^2*d^3*g^2*i^2 + 4*a*b^4*c*d^4*g^2*i^2 + a^2*b^3*d^5*g^2*i^2)*B^2*x^3 + 30*(a*b^4*c^2*d^3*g^2*i^2 + a^2*b^3*c*d^4*g^2*i^2)*B^2*x^2 + (10*a^3*b^2*c^2*d^3*g^2*i^2 - 5*a^4*b*c*d^4*g^2*i^2 + a^5*d^5*g^2*i^2)*B^2)*\log(b*x + a))*\log(d*x + c))/(b^3*d^3)$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2b^2d^2g^2i^2x^4 + A^2a^2c^2g^2i^2 + 2(A^2b^2cd + A^2abd^2)g^2i^2x^3 + (A^2b^2c^2 + 4A^2abcd + A^2a^2d^2)g^2i^2x^2 + 2(A^2abc^2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, alg
orithm="fricas")
```

```
[Out] integral(A^2*b^2*d^2*g^2*i^2*x^4 + A^2*a^2*c^2*g^2*i^2 + 2*(A^2*b^2*c*d + A
^2*a*b*d^2)*g^2*i^2*x^3 + (A^2*b^2*c^2 + 4*A^2*a*b*c*d + A^2*a^2*d^2)*g^2*i
^2*x^2 + 2*(A^2*a*b*c^2 + A^2*a^2*c*d)*g^2*i^2*x + (B^2*b^2*d^2*g^2*i^2*x^4
+ B^2*a^2*c^2*g^2*i^2 + 2*(B^2*b^2*c*d + B^2*a*b*d^2)*g^2*i^2*x^3 + (B^2*b
^2*c^2 + 4*B^2*a*b*c*d + B^2*a^2*d^2)*g^2*i^2*x^2 + 2*(B^2*a*b*c^2 + B^2*a
^2*c*d)*g^2*i^2*x)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*b^2*d^2*g^2*i^2*x
^4 + A*B*a^2*c^2*g^2*i^2 + 2*(A*B*b^2*c*d + A*B*a*b*d^2)*g^2*i^2*x^3 + (A*B
*b^2*c^2 + 4*A*B*a*b*c*d + A*B*a^2*d^2)*g^2*i^2*x^2 + 2*(A*B*a*b*c^2 + A*B
a^2*c*d)*g^2*i^2*x)*log((b*e*x + a*e)/(d*x + c)), x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int (bgx + ag)^2 (dix + ci)^2 \left( B \log \left( \frac{(bx + a)e}{dx + c} \right) + A \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(d*i*x + c*i)^2*(B*log((b*x + a)*e/(d*x + c)) + A)^2, x)
```

$$3.66 \quad \int (ag + bgx)(ci + dix)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx$$

**Optimal.** Leaf size=589

$$\frac{B^2 g i^2 (bc - ad)^4 \text{PolyLog} \left( 2, \frac{d(a+bx)}{b(c+dx)} \right)}{6b^3 d^2} - \frac{B g i^2 (bc - ad)^4 \log \left( \frac{bc-ad}{b(c+dx)} \right) \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A + B \right)}{6b^3 d^2} - \frac{B g i^2 (a + bx)(bc - ad)^3}{6b^3 d}$$

[Out] (B^2\*(b\*c - a\*d)^3\*g\*i^2\*x)/(12\*b^2\*d) + (B^2\*(b\*c - a\*d)^2\*g\*i^2\*(c + d\*x)^2)/(12\*b\*d^2) - (B^2\*(b\*c - a\*d)^4\*g\*i^2\*Log[(a + b\*x)/(c + d\*x)])/(12\*b^3\*d^2) - (B\*(b\*c - a\*d)^3\*g\*i^2\*(a + b\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(6\*b^3\*d) - (B\*(b\*c - a\*d)^2\*g\*i^2\*(a + b\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(6\*b^3) + (B\*(b\*c - a\*d)^2\*g\*i^2\*(c + d\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(4\*b\*d^2) - (B\*(b\*c - a\*d)\*g\*i^2\*(c + d\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(6\*d^2) + ((b\*c - a\*d)^2\*g\*i^2\*(a + b\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]^2)/(12\*b^3) + ((b\*c - a\*d)\*g\*i^2\*(a + b\*x)^2\*(c + d\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]^2)/(6\*b^2) + (g\*i^2\*(a + b\*x)^2\*(c + d\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]^2)/(4\*b) - (B\*(b\*c - a\*d)^4\*g\*i^2\*Log[(b\*c - a\*d)/(b\*(c + d\*x))]\*(A + B + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(6\*b^3\*d^2) - (B^2\*(b\*c - a\*d)^4\*g\*i^2\*Log[c + d\*x]/(4\*b^3\*d^2) - (B^2\*(b\*c - a\*d)^4\*g\*i^2\*PolyLog[2, (d\*(a + b\*x))/(b\*(c + d\*x))])/(6\*b^3\*d^2)

**Rubi [A]** time = 1.58651, antiderivative size = 570, normalized size of antiderivative = 0.97, number of steps used = 46, number of rules used = 13, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.325$ , Rules used = {2528, 2525, 12, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 43}

$$\frac{B^2 g i^2 (bc - ad)^4 \text{PolyLog} \left( 2, -\frac{d(a+bx)}{bc-ad} \right)}{6b^3 d^2} + \frac{B g i^2 (bc - ad)^4 \log(a + bx) \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{6b^3 d^2} + \frac{A B g i^2 x (bc - ad)^3}{6b^2 d} + \frac{B g i^2 (c + d x)^2}{6b^3 d^2}$$

Antiderivative was successfully verified.

[In] Int[(a\*g + b\*g\*x)\*(c\*i + d\*i\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2,x]

[Out] (A\*B\*(b\*c - a\*d)^3\*g\*i^2\*x)/(6\*b^2\*d) + (B^2\*(b\*c - a\*d)^3\*g\*i^2\*x)/(12\*b^2\*d) + (B^2\*(b\*c - a\*d)^2\*g\*i^2\*(c + d\*x)^2)/(12\*b\*d^2) + (B^2\*(b\*c - a\*d)^4\*g\*i^2\*Log[a + b\*x]/(12\*b^3\*d^2) - (B^2\*(b\*c - a\*d)^4\*g\*i^2\*Log[a + b\*x]^2)/(12\*b^3\*d^2) + (B^2\*(b\*c - a\*d)^3\*g\*i^2\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x)]/(6\*b^3\*d) + (B\*(b\*c - a\*d)^2\*g\*i^2\*(c + d\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(6\*b^3\*d) + (B\*(b\*c - a\*d)^2\*g\*i^2\*(c + d\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]^2)/(12\*b^3) + (B\*(b\*c - a\*d)\*g\*i^2\*(c + d\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(6\*b^3\*d) + (g\*i^2\*(a + b\*x)^2\*(c + d\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]^2)/(4\*b) - (B\*(b\*c - a\*d)^4\*g\*i^2\*Log[(b\*c - a\*d)/(b\*(c + d\*x))]\*(A + B + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(6\*b^3\*d^2) - (B^2\*(b\*c - a\*d)^4\*g\*i^2\*Log[c + d\*x]/(4\*b^3\*d^2) - (B^2\*(b\*c - a\*d)^4\*g\*i^2\*PolyLog[2, (d\*(a + b\*x))/(b\*(c + d\*x))])/(6\*b^3\*d^2)

$$\begin{aligned} & x)) / (c + d*x)) / (12*b*d^2) - (B*(b*c - a*d)*g*i^2*(c + d*x)^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])) / (6*d^2) + (B*(b*c - a*d)^4*g*i^2*\text{Log}[a + b*x]*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])) / (6*b^3*d^2) - ((b*c - a*d)*g*i^2*(c + d*x)^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]^2) / (3*d^2) + (b*g*i^2*(c + d*x)^4*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]^2) / (4*d^2) - (B^2*(b*c - a*d)^4*g*i^2*\text{Log}[c + d*x]) / (6*b^3*d^2) + (B^2*(b*c - a*d)^4*g*i^2*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)]) / (6*b^3*d^2) + (B^2*(b*c - a*d)^4*g*i^2*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]) / (6*b^3*d^2) \end{aligned}$$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_) /; FreeQ[b, x]]
```

### Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_.))^(p_.)*((c_.) + (d_.)*(x_.))^(q_.))^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

### Rule 31

```
Int[((a_) + (b_.)*(x_.))^(n_.), x_Symbol] := Simp[Log[RemoveContent[a + b*x, x]]/b, x] /; FreeQ[{a, b}, x]
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol]
:> Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e,
Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(Rfx_), x_Symbol]
:> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, Rfx, x]},
Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
Rfx, x] && IntegerQ[p]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)
*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x],
x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Log[
c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)),
x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])/g, x] -
Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))])*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol]
:> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2,
-(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rule 43



```

Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])

```

Rubi steps

$$\begin{aligned}
\int (66c + 66dx)^2(ag + bgx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx &= \int \left( \frac{(-bc + ad)g(66c + 66dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d} + \frac{bg(66c + 66dx)^2}{d} \right) dx \\
&= \frac{(bg) \int (66c + 66dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{66d} + \frac{((-bc + ad)g) \int (66c + 66dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{66d} \\
&= -\frac{1452(bc - ad)g(c + dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d^2} + \frac{1089bg(c + dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d^2} \\
&= -\frac{1452(bc - ad)g(c + dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d^2} + \frac{1089bg(c + dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d^2} \\
&= -\frac{1452(bc - ad)g(c + dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d^2} + \frac{1089bg(c + dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d^2} \\
&= -\frac{1452(bc - ad)g(c + dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d^2} + \frac{1089bg(c + dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d^2} \\
&= \frac{726AB(bc - ad)^3 gx}{b^2 d} + \frac{363B(bc - ad)^2 g(c + dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{bd^2} \\
&= \frac{726AB(bc - ad)^3 gx}{b^2 d} + \frac{726B^2(bc - ad)^3 g(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^3 d} \\
&= \frac{726AB(bc - ad)^3 gx}{b^2 d} + \frac{726B^2(bc - ad)^3 g(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^3 d} \\
&= \frac{726AB(bc - ad)^3 gx}{b^2 d} + \frac{363B^2(bc - ad)^3 gx}{b^2 d} + \frac{363B^2(bc - ad)^2 g}{bd^2} \\
&= \frac{726AB(bc - ad)^3 gx}{b^2 d} + \frac{363B^2(bc - ad)^3 gx}{b^2 d} + \frac{363B^2(bc - ad)^2 g}{bd^2} \\
&= \frac{726AB(bc - ad)^3 gx}{b^2 d} + \frac{363B^2(bc - ad)^3 gx}{b^2 d} + \frac{363B^2(bc - ad)^2 g}{bd^2} \\
&= \frac{726AB(bc - ad)^3 gx}{b^2 d} + \frac{363B^2(bc - ad)^3 gx}{b^2 d} + \frac{363B^2(bc - ad)^2 g}{bd^2}
\end{aligned}$$

**Mathematica [A]** time = 0.569135, size = 677, normalized size = 1.15

$$g^2 \left( \frac{4B(bc-ad)^2 \left( -B(bc-ad)^2 \left( \log(a+bx) \left( \log(a+bx) - 2 \log\left(\frac{b(c+dx)}{bc-ad}\right) \right) - 2 \operatorname{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) \right) + b^2(c+dx)^2 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right) + 2(bc-ad)^2 \log(a+bx) \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right) \right)}{b^3} \right)$$

Antiderivative was successfully verified.

[In] Integrate[(a\*g + b\*g\*x)\*(c\*i + d\*i\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])  
)^2,x]

[Out] (g\*i^2\*(-4\*(b\*c - a\*d)\*(c + d\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])])^2 +  
3\*b\*(c + d\*x)^4\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])^2 + (4\*B\*(b\*c - a\*d)^  
2\*(2\*A\*b\*d\*(b\*c - a\*d)\*x - B\*(b\*c - a\*d)\*(b\*d\*x + (b\*c - a\*d)\*Log[a + b\*x])  
+ 2\*B\*d\*(b\*c - a\*d)\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x]) + b^2\*(c + d\*x)  
^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]) + 2\*(b\*c - a\*d)^2\*Log[a + b\*x]\*(A +  
B\*Log[(e\*(a + b\*x))/(c + d\*x]) - 2\*B\*(b\*c - a\*d)^2\*Log[c + d\*x] - B\*(b\*c  
- a\*d)^2\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]) -  
2\*PolyLog[2, (d\*(a + b\*x))/(-b\*c + a\*d)])))/b^3 - (B\*(b\*c - a\*d)\*(6\*A\*b\*d  
\*(b\*c - a\*d)^2\*x - 3\*B\*(b\*c - a\*d)^2\*(b\*d\*x + (b\*c - a\*d)\*Log[a + b\*x]) - B  
\*(b\*c - a\*d)\*(2\*b\*d\*(b\*c - a\*d)\*x + b^2\*(c + d\*x)^2 + 2\*(b\*c - a\*d)^2\*Log[a  
+ b\*x]) + 6\*B\*d\*(b\*c - a\*d)^2\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x]) + 3\*b  
^2\*(b\*c - a\*d)\*(c + d\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]) + 2\*b^3\*(c  
+ d\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]) + 6\*(b\*c - a\*d)^3\*Log[a + b\*x  
\*B\*(b\*c - a\*d)^3\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a  
d)]) - 2\*PolyLog[2, (d\*(a + b\*x))/(-b\*c + a\*d)])))/b^3)/(12\*d^2)

**Maple [F]** time = 2.291, size = 0, normalized size = 0.

$$\int (bgx + ag)(dix + ci)^2 \left( A + B \ln \left( \frac{e(bx + a)}{dx + c} \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)^2\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2,x)

[Out] int((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)^2\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2,x)

**Maxima [B]** time = 1.80073, size = 3050, normalized size = 5.18

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)^2\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2,x, algorithm="maxima")

[Out] 
$$\begin{aligned} & 1/4*A^2*b*d^2*g*i^2*x^4 + 2/3*A^2*b*c*d*g*i^2*x^3 + 1/3*A^2*a*d^2*g*i^2*x^3 \\ & + 1/2*A^2*b*c^2*g*i^2*x^2 + A^2*a*c*d*g*i^2*x^2 + 2*(x*\log(b*e*x/(d*x + c) \\ & + a*e/(d*x + c)) + a*\log(b*x + a)/b - c*\log(d*x + c)/d)*A*B*a*c^2*g*i^2 + \\ & (x^2*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*\log(b*x + a)/b^2 + c^2*\log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*b*c^2*g*i^2 + 2*(x^2*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*\log(b*x + a)/b^2 + c^2*\log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*a*c*d*g*i^2 + 2/3*(2*x^3*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*\log(b*x + a)/b^3 - 2*c^3*\log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*b*c*d*g*i^2 + 1/3*(2*x^3*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*\log(b*x + a)/b^3 - 2*c^3*\log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a*d^2*g*i^2 + 1/12*(6*x^4*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*\log(b*x + a)/b^4 + 6*c^4*\log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*b*d^2*g*i^2 + A^2*a*c^2*g*i^2*x - 1/12*(7*a^2*b*c^2*d^2*g*i^2 - 2*a^3*c*d^3*g*i^2 - (2*g*i^2*\log(e) - g*i^2)*b^3*c^4 + 2*(4*g*i^2*\log(e) - 3*g*i^2)*a*b^2*c^3*d)*B^2*\log(d*x + c)/(b^2*d^2) + 1/6*(b^4*c^4*g*i^2 - 4*a*b^3*c^3*d*g*i^2 + 6*a^2*b^2*c^2*d^2*g*i^2 - 4*a^3*b*c*d^3*g*i^2 + a^4*d^4*g*i^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^3*d^2) + 1/12*(3*B^2*b^4*d^4*g*i^2*x^4*log(e)^2 + 2*((4*g*i^2*log(e)^2 - g*i^2*log(e))*b^4*c*d^3 + (2*g*i^2*log(e)^2 + g*i^2*log(e))*a*b^3*d^4)*B^2*x^3 + ((6*g*i^2*log(e)^2 - 5*g*i^2*log(e) + g*i^2)*b^4*c^2*d^2 + 2*(6*g*i^2*log(e)^2 + 2*g*i^2*log(e) - g*i^2)*a*b^3*c*d^3 + (g*i^2*log(e) + g*i^2)*a^2*b^2*d^4)*B^2*x^2 - ((2*g*i^2*log(e) - 3*g*i^2)*b^4*c^3*d - (12*g*i^2*log(e)^2 - 4*g*i^2*log(e) - 7*g*i^2)*a*b^3*c^2*d^2 - (8*g*i^2*log(e) + 5*g*i^2)*a^2*b^2*c*d^3 + (2*g*i^2*log(e) + g*i^2)*a^3*b*d^4)*B^2*x + (3*B^2*b^4*d^4*g*i^2*x^4 + 12*B^2*a*b^3*c^2*d^2*g*i^2*x + 4*(2*b^4*c*d^3*g*i^2 + a*b^3*d^4*g*i^2)*B^2*x^3 + 6*(b^4*c^2*d^2*g*i^2 + 2*a*b^3*c*d^3*g*i^2)*B^2*x^2 + (6*a^2*b^2*c^2*d^2*g*i^2 - 4*a^3*b*c*d^3*g*i^2 + a^4*d^4*g*i^2)*B^2)*log(b*x + a)^2 + (3*B^2*b^4*d^4*g*i^2*x^4 + 12*B^2*a*b^3*c^2*d^2*g*i^2*x + 4*(2*b^4*c*d^3*g*i^2 + a*b^3*d^4*g*i^2)*B^2*x^3 + 6*(b^4*c^2*d^2*g*i^2 + 2*a*b^3*c*d^3*g*i^2)*B^2*x^2 - (b^4*c^4*g*i^2 - 4*a*b^3*c^3*d*g*i^2)*B^2)*log(d*x + c)^2 + (6*B^2*b^4*d^4*g*i^2*x^4*log(e) + 2*((8*g*i^2*log(e) - g*i^2)*b^4*c*d^3 + (4*g*i^2*log(e) + g*i^2)*a*b^3*d^4)*B^2*x^3 + (a^2*b^2*d^4*g*i^2 + (12*g*i^2*log(e) - 5*g*i^2)*b^4*c^2*d^2 + 4*(6*g*i^2*log(e) + g$$

```

*i^2)*a*b^3*c*d^3)*B^2*x^2 - 2*(b^4*c^3*d*g*i^2 - 4*a^2*b^2*c*d^3*g*i^2 + a
^3*b*d^4*g*i^2 - 2*(6*g*i^2*log(e) - g*i^2)*a*b^3*c^2*d^2)*B^2*x - (2*a*b^3
*c^3*d*g*i^2 - (12*g*i^2*log(e) + g*i^2)*a^2*b^2*c^2*d^2 + 2*(4*g*i^2*log(e)
) - g*i^2)*a^3*b*c*d^3 - (2*g*i^2*log(e) - g*i^2)*a^4*d^4)*B^2)*log(b*x + a
) - (6*B^2*b^4*d^4*g*i^2*x^4*log(e) + 2*((8*g*i^2*log(e) - g*i^2)*b^4*c*d^3
+ (4*g*i^2*log(e) + g*i^2)*a*b^3*d^4)*B^2*x^3 + (a^2*b^2*d^4*g*i^2 + (12*g
*i^2*log(e) - 5*g*i^2)*b^4*c^2*d^2 + 4*(6*g*i^2*log(e) + g*i^2)*a*b^3*c*d^3
)*B^2*x^2 - 2*(b^4*c^3*d*g*i^2 - 4*a^2*b^2*c*d^3*g*i^2 + a^3*b*d^4*g*i^2 -
2*(6*g*i^2*log(e) - g*i^2)*a*b^3*c^2*d^2)*B^2*x + 2*(3*B^2*b^4*d^4*g*i^2*x^
4 + 12*B^2*a*b^3*c^2*d^2*g*i^2*x + 4*(2*b^4*c*d^3*g*i^2 + a*b^3*d^4*g*i^2)*
B^2*x^3 + 6*(b^4*c^2*d^2*g*i^2 + 2*a*b^3*c*d^3*g*i^2)*B^2*x^2 + (6*a^2*b^2*
c^2*d^2*g*i^2 - 4*a^3*b*c*d^3*g*i^2 + a^4*d^4*g*i^2)*B^2)*log(b*x + a))*log
(d*x + c))/(b^3*d^2)

```

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( A^2 b d^2 g i^2 x^3 + A^2 a c^2 g i^2 + (2 A^2 b c d + A^2 a d^2) g i^2 x^2 + (A^2 b c^2 + 2 A^2 a c d) g i^2 x + (B^2 b d^2 g i^2 x^3 + B^2 a c^2 g i^2 + (2 B^2 a b c d + B^2 a^2 d^2) g i^2 x^2 + (A^2 b^2 c^2 + 2 A^2 a^2 c d) g i^2 x + (B^2 b^2 d^2 g i^2 x^3 + B^2 a^2 c^2 g i^2 + (2 B^2 b^2 c d + B^2 a^2 d^2) g i^2 x^2 + (B^2 b^2 c^2 + 2 B^2 a^2 c d) g i^2 x) \log((b e x + a e) / (d x + c))^2 + 2 (A B b^2 d^2 g i^2 x^3 + A B a^2 c^2 g i^2 + (2 A B b^2 c d + A B a^2 d^2) g i^2 x^2 + (A B b^2 c^2 + 2 A B a^2 c d) g i^2 x) \log((b e x + a e) / (d x + c)) \right), x$$

Verification of antiderivative is not currently implemented for this CAS.

```

[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algor
ithm="fricas")

```

```

[Out] integral(A^2*b*d^2*g*i^2*x^3 + A^2*a*c^2*g*i^2 + (2*A^2*b*c*d + A^2*a*d^2)*
g*i^2*x^2 + (A^2*b*c^2 + 2*A^2*a*c*d)*g*i^2*x + (B^2*b*d^2*g*i^2*x^3 + B^2*
a*c^2*g*i^2 + (2*B^2*b*c*d + B^2*a*d^2)*g*i^2*x^2 + (B^2*b*c^2 + 2*B^2*a*c*
d)*g*i^2*x)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*b*d^2*g*i^2*x^3 + A*B*a
*c^2*g*i^2 + (2*A*B*b*c*d + A*B*a*d^2)*g*i^2*x^2 + (A*B*b*c^2 + 2*A*B*a*c*d
)*g*i^2*x)*log((b*e*x + a*e)/(d*x + c)), x)

```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```

[In] integrate((b*g*x+a*g)*(d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)

```

[Out] Timed out

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int (bgx + ag)(dix + ci)^2 \left( B \log \left( \frac{(bx + a)e}{dx + c} \right) + A \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)^2\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2,x, algorithm="giac")

[Out] integrate((b\*g\*x + a\*g)\*(d\*i\*x + c\*i)^2\*(B\*log((b\*x + a)\*e/(d\*x + c)) + A)^2, x)

$$3.67 \quad \int (ci + dix)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx$$

**Optimal.** Leaf size=334

$$\frac{2B^2i^2(bc - ad)^3 \text{PolyLog} \left( 2, \frac{b(c+dx)}{d(a+bx)} \right)}{3b^3d} + \frac{2Bi^2(bc - ad)^3 \log \left( 1 - \frac{b(c+dx)}{d(a+bx)} \right) \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{3b^3d} - \frac{2Bi^2(a + bx)(bc - ad)^2}{3b^3d}$$

[Out]  $(B^2*(b*c - a*d)^2*i^2*x)/(3*b^2) + (B^2*(b*c - a*d)^3*i^2*\text{Log}[(a + b*x)/(c + d*x)])/(3*b^3*d) - (2*B*(b*c - a*d)^2*i^2*(a + b*x)*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(3*b^3) - (B*(b*c - a*d)*i^2*(c + d*x)^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(3*b*d) + (i^2*(c + d*x)^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]^2)/(3*d) + (B^2*(b*c - a*d)^3*i^2*\text{Log}[c + d*x])/(b^3*d) + (2*B*(b*c - a*d)^3*i^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])*\text{Log}[1 - (b*(c + d*x))/(d*(a + b*x))])/(3*b^3*d) - (2*B^2*(b*c - a*d)^3*i^2*\text{PolyLog}[2, (b*(c + d*x))/(d*(a + b*x))])/(3*b^3*d)$

**Rubi [A]** time = 0.53155, antiderivative size = 420, normalized size of antiderivative = 1.26, number of steps used = 20, number of rules used = 13, integrand size = 32,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.406$ , Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 43}

$$\frac{2B^2i^2(bc - ad)^3 \text{PolyLog} \left( 2, -\frac{d(a+bx)}{bc-ad} \right)}{3b^3d} - \frac{2Bi^2(bc - ad)^3 \log(a + bx) \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{3b^3d} - \frac{2ABi^2x(bc - ad)^2}{3b^2} - \frac{Bi^2(c - a)}{3b^2}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[(c*i + d*i*x)^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])^2, x]$

[Out]  $(-2*A*B*(b*c - a*d)^2*i^2*x)/(3*b^2) + (B^2*(b*c - a*d)^2*i^2*x)/(3*b^2) + (B^2*(b*c - a*d)^3*i^2*\text{Log}[a + b*x])/(3*b^3*d) + (B^2*(b*c - a*d)^3*i^2*\text{Log}[a + b*x]^2)/(3*b^3*d) - (2*B^2*(b*c - a*d)^2*i^2*(a + b*x)*\text{Log}[(e*(a + b*x))/(c + d*x)]/(3*b^3) - (B*(b*c - a*d)*i^2*(c + d*x)^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(3*b*d) - (2*B*(b*c - a*d)^3*i^2*\text{Log}[a + b*x]*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(3*b^3*d) + (i^2*(c + d*x)^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]^2)/(3*d) + (2*B^2*(b*c - a*d)^3*i^2*\text{Log}[c + d*x])/(3*b^3*d) - (2*B^2*(b*c - a*d)^3*i^2*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)])/(3*b^3*d) - (2*B^2*(b*c - a*d)^3*i^2*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))])/(3*b^3*d)$

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*RFX^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFX, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.)]^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(n_), x_Symbol] := Simp[Log[RemoveContent[a + b*x, x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFX^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFX_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFX, x]},
```



Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[  
RFx, x] && IntegerQ[p]

### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.  
)\*(x\_))^(q\_.), x\_Symbol] := Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^  
n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E  
qQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] := Simp[(a + b\*Lo  
g[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_  
)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x  
)^n])/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x  
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_  
Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x  
, x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c  
(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] := -Simp[PolyLog[2  
, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rule 43

Int[((a\_.) + (b\_.)\*(x\_))^(m\_.)\*((c\_.) + (d\_.)\*(x\_))^(n\_.), x\_Symbol] := Int  
[ExpandIntegrand[(a + b\*x)^m\*(c + d\*x)^n, x], x] /; FreeQ[{a, b, c, d, n},  
x] && NeQ[b\*c - a\*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && Le  
Q[7\*m + 4\*n + 4, 0]) || LtQ[9\*m + 5\*(n + 1), 0] || GtQ[m + n + 2, 0])

### Rubi steps

$$\begin{aligned}
\int (67c + 67dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx &= \frac{4489(c+dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{3d} - \frac{(2B) \int \frac{300763(bc-ad)(c+dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{a+bx}}{201d} \\
&= \frac{4489(c+dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{3d} - \frac{(8978B(bc-ad)) \int \frac{(c+dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{a+bx}}{3d} \\
&= \frac{4489(c+dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{3d} - \frac{(8978B(bc-ad)) \int \left( \frac{d(bc-ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2} \right)}{3d} \\
&= \frac{4489(c+dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{3d} - \frac{(8978B(bc-ad)) \int (c+dx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{3b} \\
&= -\frac{8978AB(bc-ad)^2x}{3b^2} - \frac{4489B(bc-ad)(c+dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{3bd} \\
&= -\frac{8978AB(bc-ad)^2x}{3b^2} - \frac{8978B^2(bc-ad)^2(a+bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{3b^3} - \frac{4489B^2(bc-ad)^2(c+dx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{3b^3} \\
&= -\frac{8978AB(bc-ad)^2x}{3b^2} - \frac{8978B^2(bc-ad)^2(a+bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{3b^3} - \frac{4489B^2(bc-ad)^2(c+dx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{3b^3} \\
&= -\frac{8978AB(bc-ad)^2x}{3b^2} + \frac{4489B^2(bc-ad)^2x}{3b^2} + \frac{4489B^2(bc-ad)^3 \log(a+bx)}{3b^3d} \\
&= -\frac{8978AB(bc-ad)^2x}{3b^2} + \frac{4489B^2(bc-ad)^2x}{3b^2} + \frac{4489B^2(bc-ad)^3 \log(a+bx)}{3b^3d} \\
&= -\frac{8978AB(bc-ad)^2x}{3b^2} + \frac{4489B^2(bc-ad)^2x}{3b^2} + \frac{4489B^2(bc-ad)^3 \log(a+bx)}{3b^3d} \\
&= -\frac{8978AB(bc-ad)^2x}{3b^2} + \frac{4489B^2(bc-ad)^2x}{3b^2} + \frac{4489B^2(bc-ad)^3 \log(a+bx)}{3b^3d}
\end{aligned}$$

**Mathematica [A]** time = 0.215564, size = 287, normalized size = 0.86

$$i^2 \left( (c+dx)^3 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)^2 - \frac{B(bc-ad) \left( -B(bc-ad)^2 \left( \log(a+bx) \left( \log(a+bx) - 2 \log \left( \frac{b(c+dx)}{bc-ad} \right) \right) - 2 \text{PolyLog} \left( 2, \frac{d(a+bx)}{ad-bc} \right) \right) + b^2(c+dx)^2 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)^2}{3d} \right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (i^2*((c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - (B*(b*c - a*d)*
2*A*b*d*(b*c - a*d)*x - B*(b*c - a*d)*(b*d*x + (b*c - a*d)*Log[a + b*x]) +
2*B*d*(b*c - a*d)*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] + b^2*(c + d*x)^2*
(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*(b*c - a*d)^2*Log[a + b*x]*(A + B*
Log[(e*(a + b*x))/(c + d*x)]) - 2*B*(b*c - a*d)^2*Log[c + d*x] - B*(b*c - a
*d)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*P
olyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/b^3)/(3*d)
```

**Maple [F]** time = 2.044, size = 0, normalized size = 0.

$$\int (dix + ci)^2 \left( A + B \ln \left( \frac{e(bx + a)}{dx + c} \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

**Maxima [B]** time = 1.81617, size = 1623, normalized size = 4.86

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima
")
```

```
[Out] 1/3*A^2*d^2*i^2*x^3 + A^2*c*d*i^2*x^2 + 2*(x*log(b*e*x/(d*x + c) + a*e/(d*x
+ c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)*A*B*c^2*i^2 + 2*(x^2*log(b*e*
x/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2
- (b*c - a*d)*x/(b*d))*A*B*c*d*i^2 + 1/3*(2*x^3*log(b*e*x/(d*x + c) + a*e/(
d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a
*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*d^2*i^2 + A^2*c^2*i^2
*x - 1/3*(5*a*b*c^2*d*i^2 - 2*a^2*c*d^2*i^2 + (2*i^2*log(e) - 3*i^2)*b^2*c^
3)*B^2*log(d*x + c)/(b^2*d) - 2/3*(b^3*c^3*i^2 - 3*a*b^2*c^2*d*i^2 + 3*a^2*
b*c*d^2*i^2 - a^3*d^3*i^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1)
```

$$\begin{aligned}
& + \operatorname{dilog}\left(-\frac{b*d*x + a*d}{b*c - a*d}\right)*B^2/(b^3*d) + 1/3*(B^2*b^3*d^3*i^2*x^3 \\
& * \log(e)^2 + (a*b^2*d^3*i^2*\log(e) + (3*i^2*\log(e)^2 - i^2*\log(e))*b^3*c*d^2) \\
& * B^2*x^2 + ((3*i^2*\log(e)^2 - 4*i^2*\log(e) + i^2)*b^3*c^2*d + 2*(3*i^2*\log(e) - i^2) \\
& * a*b^2*c*d^2 - (2*i^2*\log(e) - i^2)*a^2*b*d^3)*B^2*x + (B^2*b^3*d^3*i^2*x^3 + 3*B^2*b^3*c*d^2*i^2*x^2 \\
& + 3*B^2*b^3*c^2*d*i^2*x + (3*a*b^2*c^2*d*i^2 - 3*a^2*b*c*d^2*i^2 + a^3*d^3*i^2)*B^2) \\
& * \log(b*x + a)^2 + (B^2*b^3*d^3*i^2*x^3 + 3*B^2*b^3*c*d^2*i^2*x^2 + 3*B^2*b^3*c^2*d*i^2*x + B^2*b^3*c^3*i^2) \\
& * \log(d*x + c)^2 + (2*B^2*b^3*d^3*i^2*x^3*\log(e) + (a*b^2*d^3*i^2 + (6*i^2*\log(e) - i^2) \\
& * b^3*c*d^2)*B^2*x^2 + 2*(3*a*b^2*c*d^2*i^2 - a^2*b*d^3*i^2 + (3*i^2*\log(e) - 2*i^2) \\
& * b^3*c^2*d)*B^2*x + (2*(3*i^2*\log(e) - 2*i^2)*a*b^2*c^2*d - (6*i^2*\log(e) - 7*i^2) \\
& * a^2*b*c*d^2 + (2*i^2*\log(e) - 3*i^2)*a^3*d^3)*B^2) \\
& * \log(b*x + a) - (2*B^2*b^3*d^3*i^2*x^3*\log(e) + (a*b^2*d^3*i^2 + (6*i^2*\log(e) - i^2) \\
& * b^3*c*d^2)*B^2*x^2 + 2*(3*a*b^2*c*d^2*i^2 - a^2*b*d^3*i^2 + (3*i^2*\log(e) - 2*i^2) \\
& * b^3*c^2*d)*B^2*x + 2*(B^2*b^3*d^3*i^2*x^3 + 3*B^2*b^3*c*d^2*i^2*x^2 + 3*B^2*b^3*c^2*d*i^2*x \\
& + (3*a*b^2*c^2*d*i^2 - 3*a^2*b*c*d^2*i^2 + a^3*d^3*i^2)*B^2) \\
& * \log(b*x + a))*\log(d*x + c))/(b^3*d)
\end{aligned}$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(A^2d^2i^2x^2 + 2A^2cdi^2x + A^2c^2i^2 + (B^2d^2i^2x^2 + 2B^2cdi^2x + B^2c^2i^2)\log\left(\frac{bex + ae}{dx + c}\right)^2 + 2(ABd^2i^2x^2 + 2ABcdi^2x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2,x, algorithm="fricas")

[Out] integral(A^2\*d^2\*i^2\*x^2 + 2\*A^2\*c\*d\*i^2\*x + A^2\*c^2\*i^2 + (B^2\*d^2\*i^2\*x^2 + 2\*B^2\*c\*d\*i^2\*x + B^2\*c^2\*i^2)\*log((b\*e\*x + a\*e)/(d\*x + c))^2 + 2\*(A\*B\*d^2\*i^2\*x^2 + 2\*A\*B\*c\*d\*i^2\*x + A\*B\*c^2\*i^2)\*log((b\*e\*x + a\*e)/(d\*x + c)), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*\*2\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))\*\*2,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int (dix + ci)^2 \left( B \log \left( \frac{(bx + a)e}{dx + c} \right) + A \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2,x, algorithm="giac")

[Out] integrate((d\*i\*x + c\*i)^2\*(B\*log((b\*x + a)\*e/(d\*x + c)) + A)^2, x)

$$3.68 \quad \int \frac{(ci+dx)^2 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)^2}{ag+bgx} dx$$

**Optimal.** Leaf size=535

$$\frac{2B^2i^2(bc-ad)^2 \text{PolyLog}\left(2, \frac{b(c+dx)}{d(a+bx)}\right) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{b^3g} + \frac{2B^2i^2(bc-ad)^2 \text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)}{b^3g} - \frac{B^2i^2(bc-ad)^2 \text{PolyLog}\left(2, \frac{b(c+dx)}{d(a+bx)}\right)}{b^3g}$$

```
[Out] -((B*d*(b*c - a*d)*i^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x]])))/(b^3
*g)) + (2*B*(b*c - a*d)^2*i^2*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*
(a + b*x))/(c + d*x]]))/(b^3*g) + (d*(b*c - a*d)*i^2*(a + b*x)*(A + B*Log[(
e*(a + b*x))/(c + d*x]]^2))/(b^3*g) + (i^2*(c + d*x)^2*(A + B*Log[(e*(a + b
*x))/(c + d*x]]^2)/(2*b*g) + (B^2*(b*c - a*d)^2*i^2*Log[c + d*x])/(b^3*g)
+ (B*(b*c - a*d)^2*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x]])*Log[1 - (b*(c +
d*x))/(d*(a + b*x))])/(b^3*g) - ((b*c - a*d)^2*i^2*(A + B*Log[(e*(a + b*x)
)/(c + d*x]]^2*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^3*g) + (2*B^2*(b*c
- a*d)^2*i^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b^3*g) - (B^2*(b*c
- a*d)^2*i^2*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^3*g) + (2*B*(b*c -
a*d)^2*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x]])*PolyLog[2, (b*(c + d*x))/(
d*(a + b*x))])/(b^3*g) + (2*B^2*(b*c - a*d)^2*i^2*PolyLog[3, (b*(c + d*x))/(
d*(a + b*x))])/(b^3*g)
```

**Rubi [B]** time = 5.1233, antiderivative size = 1676, normalized size of antiderivative = 3.13, number of steps used = 86, number of rules used = 27, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.643$ , Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2500, 2440, 2434, 2433, 2375, 2317, 2374, 6589, 2499, 2302, 30, 2396, 2525, 2486, 31}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x]]^2)/(a*g + b*g*x),
x]
```

```
[Out] -((A*B*d*(b*c - a*d)*i^2*x)/(b^2*g)) - (a*B^2*d*(b*c - a*d)*i^2*Log[a + b*x
]^2)/(b^3*g) + (B^2*(b*c - a*d)^2*i^2*Log[a + b*x]^2)/(2*b^3*g) - (A*B*(b*c
- a*d)^2*i^2*Log[g*(a + b*x)]^2)/(b^3*g) + (B^2*(b*c - a*d)^2*i^2*Log[g*(a
+ b*x)]^3)/(3*b^3*g) - (B^2*(b*c - a*d)^2*i^2*Log[a + b*x]^2*Log[-c - d*x]
)/(b^3*g) + (2*B^2*(b*c - a*d)^2*i^2*Log[a + b*x]*Log[g*(a + b*x)]*Log[-c -
d*x])/(b^3*g) - (B^2*(b*c - a*d)^2*i^2*Log[g*(a + b*x)]^2*Log[-c - d*x])/(
```

$$\begin{aligned}
& b^3g) + (B^2*(b*c - a*d)^2*i^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[(c + \\
& d*x)^{-1}]^2)/(b^3*g) - (B^2*(b*c - a*d)^2*i^2*\text{Log}[g*(a + b*x)]*\text{Log}[(c + d* \\
& x)^{-1}]^2)/(b^3*g) - (B^2*d*(b*c - a*d)*i^2*(a + b*x)*\text{Log}[(e*(a + b*x))/(c \\
& + d*x)]/(b^3*g) + (2*a*B*d*(b*c - a*d)*i^2*\text{Log}[a + b*x]*(A + B*\text{Log}[(e*(a \\
& + b*x))/(c + d*x)]))/(b^3*g) - (B*(b*c - a*d)^2*i^2*\text{Log}[a + b*x]*(A + B*\text{Log} \\
& [(e*(a + b*x))/(c + d*x)]))/(b^3*g) + (d*(b*c - a*d)*i^2*x*(A + B*\text{Log}[(e*(a \\
& + b*x))/(c + d*x)]^2)/(b^2*g) + (i^2*(c + d*x)^2*(A + B*\text{Log}[(e*(a + b*x)) \\
& /((c + d*x))]^2)/(2*b*g) + (B^2*(b*c - a*d)^2*i^2*\text{Log}[c + d*x]/(b^3*g) + (2 \\
& *B^2*c*(b*c - a*d)*i^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x]/(b^2 \\
& *g) - (2*B*c*(b*c - a*d)*i^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])*\text{Log}[c + d \\
& *x]/(b^2*g) - (B^2*c*(b*c - a*d)*i^2*\text{Log}[c + d*x]^2)/(b^2*g) + (2*a*B^2*d* \\
& (b*c - a*d)*i^2*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)]/(b^3*g) - (B^2 \\
& *(b*c - a*d)^2*i^2*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)]/(b^3*g) + ( \\
& B^2*(b*c - a*d)^2*i^2*\text{Log}[a + b*x]^2*\text{Log}[(b*(c + d*x))/(b*c - a*d)]/(b^3*g \\
& ) + (B^2*(b*c - a*d)^2*i^2*\text{Log}[g*(a + b*x)]^2*\text{Log}[(b*(c + d*x))/(b*c - a*d) \\
& ]/(b^3*g) + ((b*c - a*d)^2*i^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]^2*\text{Log}[ \\
& a*g + b*g*x]/(b^3*g) + (2*A*B*(b*c - a*d)^2*i^2*\text{Log}[(b*(c + d*x))/(b*c - a \\
& *d)]*\text{Log}[a*g + b*g*x]/(b^3*g) - (2*B^2*(b*c - a*d)^2*i^2*(\text{Log}[a + b*x] + L \\
& \text{og}[(c + d*x)^{-1}] - \text{Log}[(e*(a + b*x))/(c + d*x)])*\text{Log}[(b*(c + d*x))/(b*c - \\
& a*d)]*\text{Log}[a*g + b*g*x]/(b^3*g) - (B^2*(b*c - a*d)^2*i^2*\text{Log}[(e*(a + b*x)) \\
& /((c + d*x)]*\text{Log}[a*g + b*g*x]^2)/(b^3*g) - (B^2*(b*c - a*d)^2*i^2*\text{Log}[(b*(c \\
& + d*x))/(b*c - a*d)]*\text{Log}[a*g + b*g*x]^2)/(b^3*g) + (2*a*B^2*d*(b*c - a*d)*i \\
& ^2*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]/(b^3*g) + (2*A*B*(b*c - a*d)^2 \\
& *i^2*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]/(b^3*g) - (B^2*(b*c - a*d)^2 \\
& *i^2*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]/(b^3*g) + (2*B^2*(b*c - a*d) \\
& ^2*i^2*\text{Log}[a + b*x]*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]/(b^3*g) - (2* \\
& B^2*(b*c - a*d)^2*i^2*(\text{Log}[a + b*x] + \text{Log}[(c + d*x)^{-1}] - \text{Log}[(e*(a + b*x) \\
& )/(c + d*x)])*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]/(b^3*g) + (2*B^2*c \\
& *(b*c - a*d)*i^2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]/(b^2*g) - (2*B^2*(b \\
& *c - a*d)^2*i^2*\text{Log}[(c + d*x)^{-1}]*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]/ \\
& (b^3*g) - (2*B^2*(b*c - a*d)^2*i^2*\text{PolyLog}[3, -((d*(a + b*x))/(b*c - a*d)) \\
& ]/(b^3*g) - (2*B^2*(b*c - a*d)^2*i^2*\text{PolyLog}[3, (b*(c + d*x))/(b*c - a*d)] \\
& )/(b^3*g)
\end{aligned}$$

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]

```

### Rule 2523

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] := Simp[x*(a +
b*Log[c*RFx^p])^n, x] - Dist[b^n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*

```

$\text{RFX}^p)^{(n-1)} * D[\text{RFX}, x] / \text{RFX}, x], x] /;$  FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0]

### Rule 12

Int[(a\_)\*(u\_), x\_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b\_)\*(v\_)] /; FreeQ[b, x]

### Rule 2524

Int[((a\_.) + Log[(c\_.)\*(RFX\_)^(p\_.)]\*(b\_.))^(n\_.)/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] :> Simp[(Log[d + e\*x]\*(a + b\*Log[c\*RFX^p])^n)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[d + e\*x]\*(a + b\*Log[c\*RFX^p])^(n-1)\*D[RFX, x])/RFX, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0]

### Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*(RFX\_), x\_Symbol] :> With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n])^p, RFX, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFX, x] && IntegerQ[p]

### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.)\*(x\_))^(q\_.), x\_Symbol] :> Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] :> Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :> Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n]))/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))])\*(b\_.)/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :> Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x]



], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] := -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rule 6688

Int[u\_, x\_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifierIntegrandQ[v, u, x]]

### Rule 6742

Int[u\_, x\_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]

### Rule 2500

Int[(Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.))]^(r\_.)]\*((s\_.) + Log[(i\_.)\*((g\_.) + (h\_.)\*(x\_))^(n\_.)]\*(t\_.)))/((j\_.) + (k\_.)\*(x\_)), x\_Symbol] := Dist[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q)^r] - Log[(a + b\*x)^(p\*r)] - Log[(c + d\*x)^(q\*r)], Int[(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x], x] + (Int[(Log[(a + b\*x)^(p\*r)]\*(s + t\*Log[i\*(g + h\*x)^n]))/(j + k\*x), x] + Int[(Log[(c + d\*x)^(q\*r)]\*(s + t\*Log[i\*(g + h\*x)^n]))/(j + k\*x), x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0]

### Rule 2440

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))\*((f\_.) + Log[(h\_.)\*((i\_.) + (j\_.)\*(x\_))^(m\_.)]\*(g\_.)))/((k\_) + (l\_.)\*(x\_))^(r\_.), x\_Symbol] := Dist[1/l, Subst[Int[x^r\*(a + b\*Log[c\*(-((e\*k - d\*1)/l) + (e\*x)/l)^n])\*(f + g\*Log[h\*(-((j\*k - i\*1)/l) + (j\*x)/l)^m]), x], x, k + l\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]

### Rule 2434

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))\*((f\_.) + Log[(h\_.)\*((i\_.) + (j\_.)\*(x\_))^(m\_.)]\*(g\_.)))/((k\_) + (l\_.)\*(x\_))^(r\_.), x\_Symbol] := Simp[Log[x]\*(a + b\*Log[c\*(d + e\*x)^n])\*(f + g\*Log[h\*(i + j\*x)^m]), x] + (-Dist[e\*g\*m, Int[(Log[x]\*(a + b\*Log[c\*(d + e\*x)^n]))/(d + e\*x), x], x] - Dist[b\*j\*n, Int[(Log[x]\*(f + g\*Log[h\*(i + j\*x)^m]))/(i + j\*x), x], x]) /; FreeQ[{a, b, c, d, e, f

, g, h, i, j, m, n}, x] && EqQ[e\*i - d\*j, 0]

### Rule 2433

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_.) + Log[(h\_.)\*((i\_.) + (j\_.)\*(x\_))^(m\_.)]\*(g\_.))\*((k\_.) + (l\_.)\*(x\_))^(r\_.), x\_Symbol] :> Dist[1/e, Subst[Int[((k\*x)/d)^r\*(a + b\*Log[c\*x^n])^p\*(f + g\*Log[h\*(e\*i - d\*j)/e + (j\*x)/e]^m), x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e\*k - d\*l, 0]

### Rule 2375

Int[(Log[(d\_.)\*((e\_) + (f\_.)\*(x\_)^(m\_.))]^(r\_.))\*((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/(x\_), x\_Symbol] :> Simp[(Log[d\*(e + f\*x^m)^r]\*(a + b\*Log[c\*x^n])^(p + 1))/(b\*n\*(p + 1)), x] - Dist[(f\*m\*r)/(b\*n\*(p + 1)), Int[(x^(m - 1)\*(a + b\*Log[c\*x^n])^(p + 1))/(e + f\*x^m), x], x] /; FreeQ[{a, b, c, d, e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d\*e, 1]

### Rule 2317

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/((d\_) + (e\_.)\*(x\_)), x\_Symbol] :> Simp[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^p)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

### Rule 2374

Int[(Log[(d\_.)\*((e\_) + (f\_.)\*(x\_)^(m\_.))]\*(a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/(x\_), x\_Symbol] :> -Simp[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^p)/m, x] + Dist[(b\*n\*p)/m, Int[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0] && EqQ[d\*e, 1]

### Rule 6589

Int[PolyLog[n\_, (c\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)]/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] :> Simp[PolyLog[n + 1, c\*(a + b\*x)^p]/(e\*p), x] /; FreeQ[{a, b, c, d, e, n, p}, x] && EqQ[b\*d, a\*e]

### Rule 2499

Int[(Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.)]^(r\_.))\*((s\_.) + Log[(i\_.)\*((g\_.) + (h\_.)\*(x\_))^(n\_.)]\*(t\_.))^(m\_.)/(j\_.) + (k\_.)\*(x\_)), x\_Symbol] :> Simp[((s + t\*Log[i\*(g + h\*x)^n])^(m + 1)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r)/(k\*n\*t\*(m + 1)), x] + (-Dist[(b\*p\*r)/(k\*n

```
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dist
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

### Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
x]
```

### Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

### Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q]^r]^s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

### Rule 31

```
Int[((a_) + (b_.)*(x_))^( -1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{(68c + 68dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{ag + bgx} dx &= \int \left( \frac{4624d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g} + \frac{68d(68c + 68dx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{bg} \right) dx \\
&= \frac{(4624(bc - ad)^2) \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{ag + bgx} dx}{b^2} + \frac{(68d) \int (68c + 68dx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{bg} \\
&= \frac{4624d(bc - ad)x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g} + \frac{2312(c + dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{bg} \\
&= \frac{4624d(bc - ad)x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g} + \frac{2312(c + dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{bg} \\
&= \frac{4624d(bc - ad)x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g} + \frac{2312(c + dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{bg} \\
&= \frac{4624d(bc - ad)x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g} + \frac{2312(c + dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{bg} \\
&= -\frac{4624ABd(bc - ad)x}{b^2g} + \frac{9248aBd(bc - ad) \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3g} \\
&= -\frac{4624ABd(bc - ad)x}{b^2g} - \frac{4624B^2d(bc - ad)(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^3g} + \frac{9248aBd(bc - ad) \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3g} \\
&= -\frac{4624ABd(bc - ad)x}{b^2g} - \frac{4624B^2d(bc - ad)(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^3g} + \frac{9248aBd(bc - ad) \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3g} \\
&= -\frac{4624ABd(bc - ad)x}{b^2g} - \frac{4624B^2d(bc - ad)(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^3g} + \frac{9248aBd(bc - ad) \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3g} \\
&= -\frac{4624ABd(bc - ad)x}{b^2g} - \frac{4624B^2d(bc - ad)(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^3g} + \frac{9248aBd(bc - ad) \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3g} \\
&= -\frac{4624ABd(bc - ad)x}{b^2g} - \frac{4624aB^2d(bc - ad) \log^2(a + bx)}{b^3g} + \frac{2312B^2(bc - ad)}{b^3g} \\
&= -\frac{4624ABd(bc - ad)x}{b^2g} - \frac{4624aB^2d(bc - ad) \log^2(a + bx)}{b^3g} + \frac{2312B^2(bc - ad)}{b^3g}
\end{aligned}$$

**Mathematica [B]** time = 3.44435, size = 1987, normalized size = 3.71

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x),x]
```

```
[Out] (i^2*(12*A^2*b*d*(2*b*c - a*d)*x + 6*A^2*b^2*d^2*x^2 + 12*A^2*(b*c - a*d)^2*Log[a + b*x] - 24*A*b*B*c*(a*d*Log[a/b + x]^2 - 2*a*d*Log[a/b + x]*(1 + Log[a + b*x]) + 2*(-(b*c) + a*d + Log[c/d + x]*(b*c + a*d*Log[a + b*x] - a*d*Log[(d*(a + b*x))/(-(b*c) + a*d)])) + (-(b*d*x) + a*d*Log[a + b*x])*Log[(e*(a + b*x))/(c + d*x)] - 2*a*d*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 12*A*b^2*B*c^2*(Log[a/b + x]^2 - 2*Log[a + b*x]*(Log[a/b + x] - Log[c/d + x] - Log[(e*(a + b*x))/(c + d*x)]) - 2*(Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] + PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + 6*A*B*(-4*a*d^2*(a + b*x)*(-1 + Log[a/b + x]) + 2*a^2*d^2*Log[a/b + x]^2 + 4*a*b*d*(c + d*x)*(-1 + Log[c/d + x]) + d^2*(b*x*(2*a - b*x) + 2*b^2*x^2*Log[a/b + x] - 2*a^2*Log[a + b*x]) - 2*d^2*(b*x*(-2*a + b*x) + 2*a^2*Log[a + b*x])*(Log[a/b + x] - Log[c/d + x] - Log[(e*(a + b*x))/(c + d*x)]) + b^2*(d*x*(-2*c + d*x) - 2*d^2*x^2*Log[c/d + x] + 2*c^2*Log[c + d*x]) - 4*a^2*d^2*(Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] + PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + 8*b*B^2*c*(Log[(e*(a + b*x))/(c + d*x)]*(-(a*d*Log[(e*(a + b*x))/(c + d*x)]^2) + 6*(b*c - a*d)*Log[(b*c - a*d)/(b*c + b*d*x)] + 3*d*Log[(e*(a + b*x))/(c + d*x)]*(a + b*x + a*Log[(b*c - a*d)/(b*c + b*d*x)])) + 6*(b*c - a*d + a*d*Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - 6*a*d*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))] + B^2*(4*a^2*d^2*Log[a/b + x]^3 - 12*a*d^2*(2*b*x - 2*(a + b*x)*Log[a/b + x] + (a + b*x)*Log[a/b + x]^2) - 3*d^2*(b*x*(6*a - b*x) + (-6*a^2 - 4*a*b*x + 2*b^2*x^2)*Log[a/b + x] + 2*(a^2 - b^2*x^2)*Log[a/b + x]^2) - 12*a*b*d*(2*d*x - 2*(c + d*x)*Log[c/d + x] + (c + d*x)*Log[c/d + x]^2) - 3*b^2*(d*x*(6*c - d*x) + (-6*c^2 - 4*c*d*x + 2*d^2*x^2)*Log[c/d + x] + 2*(c^2 - d^2*x^2)*Log[c/d + x]^2) + 6*d^2*(b*x*(-2*a + b*x) + 2*a^2*Log[a + b*x])*(-Log[a/b + x] + Log[c/d + x] + Log[(e*(a + b*x))/(c + d*x)])^2 - 6*(Log[a/b + x] - Log[c/d + x] - Log[(e*(a + b*x))/(c + d*x)])*(-4*a*d^2*(a + b*x)*(-1 + Log[a/b + x]) + 2*a^2*d^2*Log[a/b + x]^2 + 4*a*b*d*(c + d*x)*(-1 + Log[c/d + x]) + d^2*(b*x*(2*a - b*x) + 2*b^2*x^2*Log[a/b + x] - 2*a^2*Log[a + b*x]) + b^2*(d*x*(-2*c + d*x) - 2*d^2*x^2*Log[c/d + x] + 2*c^2*Log[c + d*x]) - 4*a^2*d^2*(Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] + PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + 6*(2*a*b*c*d + 3*b^2*c*d*x + 3*a*b*d^2*x - b^2*d^2*x^2 - 2*a*b*d^2*x*Log[c/d + x] + b^2*d^2*x^2*Log[c/d + x] - a^2*d^2*Log[a + b*x] - b^2*c^2*Log[c + d*x] - 2*a*b*c*d*Log[c + d*x] - Log[a/b + x]*(b*d*(2*a*c + b*x*(2*c - d*x)) - 2*d^2*(a^2 - b^2*x^2)*Log[c/d + x] + (-2*b^2*c^2 + 2*a^2*d^2)*Log[(b*(c + d*x))/(b*c -
```

$a*d)) + 2*(b^2*c^2 - a^2*d^2)*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)] +$   
 $4*a*d*(a*d + 2*b*d*x - b*d*x*Log[c/d + x] - b*c*Log[c + d*x] + Log[a/b + x]$   
 $*(-(d*(a + b*x)) + d*(a + b*x)*Log[c/d + x] + (b*c - a*d)*Log[(b*(c + d*x))$   
 $/(b*c - a*d)]) + (b*c - a*d)*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)] - 2*$   
 $a^2*d^2*(Log[a/b + x]^2*(Log[c/d + x] - Log[(b*(c + d*x))/(b*c - a*d)]) - 2$   
 $*Log[a/b + x]*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)] + 2*PolyLog[3, (d*(a$   
 $+ b*x))/(-(b*c) + a*d)]) + 12*a^2*d^2*(Log[c/d + x]^2*Log[(d*(a + b*x))/$   
 $-(b*c) + a*d)] + 2*Log[c/d + x]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] - 2*P$   
 $olyLog[3, (b*(c + d*x))/(b*c - a*d)]) - 12*b^2*B^2*c^2*(Log[(-(b*c) + a*d)$   
 $/(d*(a + b*x))]*Log[(e*(a + b*x))/(c + d*x)]^2 - 2*Log[(e*(a + b*x))/(c + d$   
 $*x)]*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))] - 2*PolyLog[3, (b*(c + d*x))/$   
 $(d*(a + b*x))])])/(12*b^3*g)$

**Maple [F]** time = 3.013, size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2}{bgx + ag} \left( A + B \ln \left( \frac{e(bx + a)}{dx + c} \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*i\*x+c\*i)^2\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g),x)

[Out] int((d\*i\*x+c\*i)^2\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g),x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g),x, algorithm="maxima")

[Out]  $2*A^2*c*d*i^2*(x/(b*g) - a*log(b*x + a)/(b^2*g)) + 1/2*A^2*d^2*i^2*(2*a^2*log(b*x + a)/(b^3*g) + (b*x^2 - 2*a*x)/(b^2*g)) + A^2*c^2*i^2*log(b*g*x + a*g)/(b*g) + 1/2*(B^2*b^2*d^2*i^2*x^2 + 2*(2*b^2*c*d*i^2 - a*b*d^2*i^2)*B^2*x + 2*(b^2*c^2*i^2 - 2*a*b*c*d*i^2 + a^2*d^2*i^2)*B^2*log(b*x + a))*log(d*x + c)^2/(b^3*g) - integrate(-(B^2*b^3*c^3*i^2*log(e)^2 + 2*A*B*b^3*c^3*i^2*log(e) + (B^2*b^3*d^3*i^2*log(e)^2 + 2*A*B*b^3*d^3*i^2*log(e))*x^3 + 3*(B^2*$

$$b^3cd^2i^2\log(e)^2 + 2ABb^3cd^2i^2\log(e))x^2 + (B^2b^3d^3i^2x^3 + 3B^2b^3cd^2i^2x^2 + 3B^2b^3c^2di^2x + B^2b^3c^3i^2)\log(bx + a)^2 + 3(B^2b^3c^2di^2\log(e)^2 + 2ABb^3c^2di^2\log(e))x + 2(B^2b^3c^3i^2\log(e) + ABb^3c^3i^2 + (B^2b^3d^3i^2\log(e) + ABb^3d^3i^2))x^3 + 3(B^2b^3cd^2i^2\log(e) + ABb^3cd^2i^2)x^2 + 3(B^2b^3c^2di^2\log(e) + ABb^3c^2di^2)x\log(bx + a) - (2B^2b^3c^3i^2\log(e) + 2ABb^3c^3i^2 + (2ABb^3d^3i^2 + (2i^2\log(e) + i^2)B^2b^3d^3))x^3 + (6ABb^3cd^2i^2 - (ab^2d^3i^2 - 2(3i^2\log(e) + 2i^2)b^3cd^2)B^2)x^2 + 2(3ABb^3c^2di^2 + (3b^3c^2di^2\log(e) + 2ab^2cd^2i^2 - a^2bd^3i^2)B^2)x + 2(B^2b^3d^3i^2x^3 + 3B^2b^3cd^2i^2x^2 + (4b^3c^2di^2 - 2ab^2cd^2i^2 + a^2bd^3i^2)B^2)x + (b^3c^3i^2 + ab^2c^2di^2 - 2a^2b^3cd^2i^2 + a^3d^3i^2)B^2)\log(bx + a)\log(dx + c))/(b^4d^3g^2x + ab^3c^2g + (b^4c^2g + ab^3d^2g)x), x$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{A^2d^2i^2x^2 + 2A^2cdi^2x + A^2c^2i^2 + (B^2d^2i^2x^2 + 2B^2cdi^2x + B^2c^2i^2)\log\left(\frac{bex+ae}{dx+c}\right)^2 + 2(ABd^2i^2x^2 + 2ABcdi^2x + ABc^2i^2)}{bgx + ag}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x, algorith="fricas")
```

```
[Out] integral((A^2*d^2*i^2*x^2 + 2*A^2*c*d*i^2*x + A^2*c^2*i^2 + (B^2*d^2*i^2*x^2 + 2*B^2*c*d*i^2*x + B^2*c^2*i^2)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*d^2*i^2*x^2 + 2*A*B*c*d*i^2*x + A*B*c^2*i^2)*log((b*e*x + a*e)/(d*x + c)))/(b*g*x + a*g), x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g),x)
```



[Out] Timed out

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2 \left( B \log \left( \frac{(bx+a)e}{dx+c} \right) + A \right)^2}{bgx + ag} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g),x, algorithm="giac")

[Out] integrate((d\*i\*x + c\*i)^2\*(B\*log((b\*x + a)\*e/(d\*x + c)) + A)^2/(b\*g\*x + a\*g), x)

$$3.69 \quad \int \frac{(ci+dix)^2 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)^2}{(ag+bgx)^2} dx$$

**Optimal.** Leaf size=442

$$\frac{4Bdi^2(bc-ad)\text{PolyLog}\left(2, \frac{b(c+dx)}{d(a+bx)}\right)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{b^3g^2} + \frac{2B^2di^2(bc-ad)\text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)}{b^3g^2} + \frac{4B^2di^2(bc-ad)\text{PolyLog}\left(2, \frac{bc-ad}{d(a+bx)}\right)}{b^3g^2}$$

[Out]  $(-2*B^2*(b*c - a*d)*i^2*(c + d*x))/(b^2*g^2*(a + b*x)) - (2*B*(b*c - a*d)*i^2*(c + d*x)*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])/(b^2*g^2*(a + b*x)) + (2*B*d*(b*c - a*d)*i^2*\text{Log}[(b*c - a*d)/(b*(c + d*x)]*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x]))/(b^3*g^2) + (d^2*i^2*(a + b*x)*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x]))^2/(b^3*g^2) - ((b*c - a*d)*i^2*(c + d*x)*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x]))^2/(b^2*g^2*(a + b*x)) - (2*d*(b*c - a*d)*i^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x]))^2*\text{Log}[1 - (b*(c + d*x))/(d*(a + b*x))]/(b^3*g^2) + (2*B^2*d*(b*c - a*d)*i^2*\text{PolyLog}[2, (d*(a + b*x))/(b*(c + d*x))]/(b^3*g^2) + (4*B*d*(b*c - a*d)*i^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])*\text{PolyLog}[2, (b*(c + d*x))/(d*(a + b*x))]/(b^3*g^2) + (4*B^2*d*(b*c - a*d)*i^2*\text{PolyLog}[3, (b*(c + d*x))/(d*(a + b*x))]/(b^3*g^2)$

**Rubi [B]** time = 3.88662, antiderivative size = 1219, normalized size of antiderivative = 2.76, number of steps used = 65, number of rules used = 21, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.5$ , Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 44, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610}

$$-\frac{aB^2d^2 \log^2(a+bx)i^2}{b^3g^2} + \frac{B^2d(bc-ad) \log^2(a+bx)i^2}{b^3g^2} - \frac{2ABd(bc-ad) \log^2(a+bx)i^2}{b^3g^2} - \frac{2B^2d(bc-ad) \log\left(-\frac{bc-ad}{d(a+bx)}\right) \log^2(a+bx)i^2}{b^3g^2}$$

Antiderivative was successfully verified.

[In] Int[((c\*i + d\*i\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))^2)/(a\*g + b\*g\*x)^2, x]

[Out]  $(-2*B^2*(b*c - a*d)^2*i^2)/(b^3*g^2*(a + b*x)) - (2*B^2*d*(b*c - a*d)*i^2*\text{Log}[a + b*x]/(b^3*g^2) - (a*B^2*d^2*i^2*\text{Log}[a + b*x]^2)/(b^3*g^2) - (2*A*B*d*(b*c - a*d)*i^2*\text{Log}[a + b*x]^2)/(b^3*g^2) + (B^2*d*(b*c - a*d)*i^2*\text{Log}[a + b*x]^2)/(b^3*g^2) - (2*B^2*d*(b*c - a*d)*i^2*\text{Log}[-((b*c - a*d)/(d*(a + b*x)))]*\text{Log}[(e*(a + b*x))/(c + d*x)]^2)/(b^3*g^2) - (2*B^2*d*(b*c - a*d)*i^2*\text{Log}[a + b*x]*\text{Log}[(e*(a + b*x))/(c + d*x)]^2)/(b^3*g^2) - (2*B*(b*c - a*d)^2$

$$\begin{aligned}
& i^2(A + B \operatorname{Log}[(e(a + bx))/(c + dx)])/(b^3 g^2(a + bx)) + (2aBd^2 \\
& i^2 \operatorname{Log}[a + bx](A + B \operatorname{Log}[(e(a + bx))/(c + dx)])/(b^3 g^2) - (2Bd^2 \\
& (bc - ad)i^2 \operatorname{Log}[a + bx](A + B \operatorname{Log}[(e(a + bx))/(c + dx)])/(b^3 g^2 \\
& ) + (d^2 i^2 x(A + B \operatorname{Log}[(e(a + bx))/(c + dx)])^2)/(b^2 g^2) - ((bc - \\
& ad)^2 i^2 (A + B \operatorname{Log}[(e(a + bx))/(c + dx)])^2)/(b^3 g^2(a + bx)) + (2 \\
& d(bc - ad)i^2 \operatorname{Log}[a + bx](A + B \operatorname{Log}[(e(a + bx))/(c + dx)])^2)/(b^3 \\
& g^2) + (2B^2 d^2 (bc - ad)i^2 \operatorname{Log}[c + dx])/(b^3 g^2) + (2B^2 c d i^2 \\
& \operatorname{Log}[-((d(a + bx))/(bc - ad))] \operatorname{Log}[c + dx])/(b^2 g^2) - (2B^2 d^2 (bc - \\
& ad)i^2 \operatorname{Log}[-((d(a + bx))/(bc - ad))] \operatorname{Log}[c + dx])/(b^3 g^2) - (2B^2 c \\
& d i^2 (A + B \operatorname{Log}[(e(a + bx))/(c + dx)]) \operatorname{Log}[c + dx])/(b^2 g^2) + (2B \\
& d^2 (bc - ad)i^2 (A + B \operatorname{Log}[(e(a + bx))/(c + dx)]) \operatorname{Log}[c + dx])/(b^3 \\
& g^2) - (B^2 c d i^2 \operatorname{Log}[c + dx]^2)/(b^2 g^2) + (B^2 d^2 (bc - ad)i^2 \operatorname{Log}[ \\
& c + dx]^2)/(b^3 g^2) + (2aB^2 d^2 i^2 \operatorname{Log}[a + bx] \operatorname{Log}[(b(c + dx))/(b \\
& c - ad)])/(b^3 g^2) + (4A^2 B d^2 (bc - ad)i^2 \operatorname{Log}[a + bx] \operatorname{Log}[(b(c + d \\
& x))/(bc - ad)])/(b^3 g^2) - (2B^2 d^2 (bc - ad)i^2 \operatorname{Log}[a + bx] \operatorname{Log}[(b \\
& (c + dx))/(bc - ad)])/(b^3 g^2) + (2aB^2 d^2 i^2 \operatorname{PolyLog}[2, -((d(a + \\
& bx))/(bc - ad))]/(b^3 g^2) + (4A^2 B d^2 (bc - ad)i^2 \operatorname{PolyLog}[2, -((d \\
& a + bx))/(bc - ad))]/(b^3 g^2) - (2B^2 d^2 (bc - ad)i^2 \operatorname{PolyLog}[2, -( \\
& (d(a + bx))/(bc - ad))]/(b^3 g^2) + (2B^2 c d i^2 \operatorname{PolyLog}[2, (b(c + \\
& dx))/(bc - ad)]/(b^2 g^2) - (2B^2 d^2 (bc - ad)i^2 \operatorname{PolyLog}[2, (b(c + \\
& dx))/(bc - ad)]/(b^3 g^2) + (4B^2 d^2 (bc - ad)i^2 \operatorname{Log}[(e(a + bx)) \\
& / (c + dx)] \operatorname{PolyLog}[2, 1 + (bc - ad)/(d(a + bx))]/(b^3 g^2) + (4B^2 d^2 \\
& (bc - ad)i^2 \operatorname{PolyLog}[3, 1 + (bc - ad)/(d(a + bx))]/(b^3 g^2)
\end{aligned}$$

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]

```

### Rule 2523

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] := Simp[x*(a +
b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]

```

### Rule 12

```

Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]

```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol]
:> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e,
Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol]
:> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)
*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x],
x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Log[
c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)),
x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])/g, x] -
Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))])*(b_.)/((f_.) + (g_.)*(x_)), x_Symbol]
:> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]/(x_), x_Symbol] :> -Simp[PolyLog[2,
-(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

#### Rule 44

```
Int[((a_) + (b_.)*(x_.))^(m_.)*((c_.) + (d_.)*(x_.))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

#### Rule 6688

```
Int[u_, x_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifierIntegrandQ[v, u, x]]
```

#### Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]
```

#### Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_.))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_.)*(x_.))^(q_.)*((h_.) + (i_.)*(x_.))^(r_.), x_Symbol] := Dist[1/e, Subst[Int[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

#### Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_.)^(n_.)]*(b_.))^(p_.)/((x_.)*((d_.) + (e_.)*(x_.))), x_Symbol] := Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]
```

#### Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_.)^(n_.)]*(b_.))^(p_.)/((d_.) + (e_.)*(x_.)), x_Symbol] := Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e, Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
```

, c, d, e, n}, x] && IGtQ[p, 0]

### Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s + 1))/(p*r*(s + 1)*(b*c
- a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q]^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
EqQ[p + q, 0] && NeQ[s, -1]
```

### Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q]^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

### Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))
^(q_.)]^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

### Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /; !FalseQ[w] /; FreeQ[n, x]
```

### Rubi steps

$$\begin{aligned}
\int \frac{(69c + 69dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(ag + bgx)^2} dx &= \int \left( \frac{4761d^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g^2} + \frac{4761(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g^2(a + bx)^2} \right) dx \\
&= \frac{(4761d^2) \int \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{b^2g^2} + \frac{(9522d(bc - ad)) \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{a+bx} dx}{b^2g^2} \\
&= \frac{4761d^2x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g^2} - \frac{4761(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3g^2(a + bx)} + \dots \\
&= \frac{4761d^2x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g^2} - \frac{4761(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3g^2(a + bx)} + \dots \\
&= \frac{4761d^2x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g^2} - \frac{4761(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3g^2(a + bx)} + \dots \\
&= \frac{4761d^2x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g^2} - \frac{4761(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3g^2(a + bx)} + \dots \\
&= \frac{4761d^2x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g^2} - \frac{4761(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3g^2(a + bx)} + \dots \\
&= -\frac{9522B(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3g^2(a + bx)} + \frac{9522ABd^2 \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3g^2} \\
&= -\frac{9522B(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3g^2(a + bx)} + \frac{9522ABd^2 \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3g^2} \\
&= -\frac{9522B^2d(bc - ad) \log(a + bx) \log^2 \left( \frac{e(a+bx)}{c+dx} \right)}{b^3g^2} - \frac{9522B(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3g^2(a + bx)} \\
&= -\frac{9522B^2(bc - ad)^2}{b^3g^2(a + bx)} - \frac{9522B^2d(bc - ad) \log(a + bx)}{b^3g^2} - \frac{9522B^2d(bc - ad) \log^2(a + bx)}{b^3g^2} \\
&= -\frac{9522B^2(bc - ad)^2}{b^3g^2(a + bx)} - \frac{9522B^2d(bc - ad) \log(a + bx)}{b^3g^2} - \frac{9522ABd(bc - ad) \log(a + bx)}{b^3g^2} \\
&= -\frac{9522B^2(bc - ad)^2}{b^3g^2(a + bx)} - \frac{9522B^2d(bc - ad) \log(a + bx)}{b^3g^2} - \frac{4761aB^2d^2 \log^2(a + bx)}{b^3g^2} \\
&= -\frac{9522B^2(bc - ad)^2}{b^3g^2(a + bx)} - \frac{9522B^2d(bc - ad) \log(a + bx)}{b^3g^2} - \frac{4761aB^2d^2 \log^2(a + bx)}{b^3g^2}
\end{aligned}$$

**Mathematica [B]** time = 8.36429, size = 2652, normalized size = 6.

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b
*g*x)^2,x]
```

```
[Out] (i^2*(3*A^2*b*d^2*x - (3*A^2*(b*c - a*d)^2)/(a + b*x) + 6*A^2*d*(b*c - a*d)
*Log[a + b*x] - (6*A*b^2*B*c^2*(-(d*(a + b*x)*Log[c/d + x]) + d*(a + b*x)*L
og[(d*(a + b*x))/(-b*c) + a*d]) + (b*c - a*d)*(1 + Log[(e*(a + b*x))/(c +
d*x)])))/((b*c - a*d)*(a + b*x)) + (3*b^2*B^2*c^2*(-2*b*c + 2*a*d - 2*d*(a
+ b*x)*Log[a + b*x] - 2*(b*c - a*d)*Log[(e*(a + b*x))/(c + d*x)] - 2*d*(a +
b*x)*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] - (b*c - a*d)*Log[(e*(a + b
*x))/(c + d*x)]^2 + 2*d*(a + b*x)*Log[c + d*x] - 2*d*(a + b*x)*Log[(e*(a +
b*x))/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + d*(a + b*x)*(Log[a + b*x]
*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d])) - 2*PolyLog[2, (d*(a + b
*x))/(-b*c) + a*d]) + d*(a + b*x)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[
(d*(a + b*x))/(-b*c) + a*d] + Log[(b*c - a*d)/(b*c + b*d*x)] - 2*PolyLog
[2, (b*(c + d*x))/(b*c - a*d)])))/((b*c - a*d)*(a + b*x)) + 6*A*b*B*c*d*(Lo
g[a/b + x]^2 - 2*Log[a/b + x]*Log[a + b*x] - 2*Log[c/d + x]*Log[(d*(a + b*x
))/(-b*c) + a*d] + 2*Log[a + b*x]*((a*d)/(b*c - a*d) + Log[c/d + x] + Log
[(e*(a + b*x))/(c + d*x)] + 2*a*((a + b*x)^(-1) + Log[(e*(a + b*x))/(c + d
*x)]/(a + b*x) + (d*Log[c + d*x])/(-b*c) + a*d)) - 2*PolyLog[2, (b*(c + d
*x))/(b*c - a*d)] + 6*A*B*d^2*((a + b*x)*(-1 + Log[a/b + x]) - a*Log[a/b +
x]^2 - (a^2*(1 + Log[a/b + x]))/(a + b*x) - b*(c/d + x)*(-1 + Log[c/d + x])
+ (a^2*Log[c/d + x])/(a + b*x) + (b*x - a^2/(a + b*x) - 2*a*Log[a + b*x])*
(-Log[a/b + x] + Log[c/d + x] + Log[(e*(a + b*x))/(c + d*x)] + (a^2*d*(Log
[a + b*x] - Log[c + d*x]))/(-b*c) + a*d) + 2*a*(Log[c/d + x]*Log[(d*(a + b
*x))/(-b*c) + a*d] + PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + B^2*d^2*(6
*b*x - 6*(a + b*x)*Log[a/b + x] + 3*(a + b*x)*Log[a/b + x]^2 - 2*a*Log[a/b
+ x]^3 - (3*a^2*(2 + 2*Log[a/b + x] + Log[a/b + x]^2))/(a + b*x) + (3*b*(2
*d*x - 2*(c + d*x)*Log[c/d + x] + (c + d*x)*Log[c/d + x]^2))/d + 3*(b*x - a^
2/(a + b*x) - 2*a*Log[a + b*x])*(-Log[a/b + x] + Log[c/d + x] + Log[(e*(a +
b*x))/(c + d*x)]^2 - (6*(a*d + 2*b*d*x - b*d*x*Log[c/d + x] - b*c*Log[c +
d*x] + Log[a/b + x]*(-d*(a + b*x)) + d*(a + b*x)*Log[c/d + x] + (b*c - a
d)*Log[(b*(c + d*x))/(b*c - a*d)])) + (b*c - a*d)*PolyLog[2, (d*(a + b*x))/(-
b*c) + a*d)]/d + (3*a^2*(d*(a + b*x)*Log[a/b + x]^2 + 2*((-b*c) + a*d)
*Log[c/d + x] + d*(a + b*x)*(Log[a + b*x] - Log[c + d*x])) - 2*Log[a/b + x]
*((b*c - a*d)*Log[c/d + x] + d*(a + b*x)*Log[(b*(c + d*x))/(b*c - a*d)]) -
2*d*(a + b*x)*PolyLog[2, (d*(a + b*x))/(-b*c) + a*d)]/((-b*c) + a*d)*(a
+ b*x)) + (3*a^2*(-(b*(c + d*x)*Log[c/d + x]^2) + 2*d*(a + b*x)*Log[c/d +
x]*Log[(d*(a + b*x))/(-b*c) + a*d] + 2*d*(a + b*x)*PolyLog[2, (b*(c + d*x
```



```

)))/(b*c - a*d)))/((b*c - a*d)*(a + b*x)) + 6*(-Log[a/b + x] + Log[c/d + x]
+ Log[(e*(a + b*x))/(c + d*x)])*((a + b*x)*(-1 + Log[a/b + x]) - a*Log[a/b
+ x]^2 - (a^2*(1 + Log[a/b + x]))/(a + b*x) - b*(c/d + x)*(-1 + Log[c/d +
x]) + (a^2*Log[c/d + x]))/(a + b*x) + (a^2*d*(Log[a + b*x] - Log[c + d*x]))/
(-(b*c) + a*d) + 2*a*(Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Poly
Log[2, (b*(c + d*x))/(b*c - a*d)]) + 6*a*(Log[a/b + x]^2*(Log[c/d + x] - L
og[(b*(c + d*x))/(b*c - a*d)]) - 2*Log[a/b + x]*PolyLog[2, (d*(a + b*x))/(-
(b*c) + a*d)] + 2*PolyLog[3, (d*(a + b*x))/(-(b*c) + a*d)]) - 6*a*(Log[c/d
+ x]^2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + 2*Log[c/d + x]*PolyLog[2, (b*(c
+ d*x))/(b*c - a*d)] - 2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)]) + (2*b*B^2
*c*d*(6*b*c - 6*a*d - (6*b^2*c*x)/(a + b*x) + (6*a*b*d*x)/(a + b*x) + 6*a*d
*Log[a/b + x] + 3*b*c*Log[a/b + x]^2 - 3*a*d*Log[a/b + x]^2 - 6*b*c*Log[c/d
+ x] + 6*b*c*Log[a + b*x] - 6*a*d*Log[a + b*x] - 6*b*c*Log[a/b + x]*Log[a
+ b*x] + 6*a*d*Log[a/b + x]*Log[a + b*x] + 6*b*c*Log[c/d + x]*Log[a + b*x]
- 6*a*d*Log[c/d + x]*Log[a + b*x] - 6*b*c*Log[c/d + x]*Log[(d*(a + b*x))/(-
(b*c) + a*d)] + 6*a*d*Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] - (6*b
*(b*c - a*d)*x*Log[(e*(a + b*x))/(c + d*x]))/(a + b*x) + 6*b*c*Log[a + b*x]
*Log[(e*(a + b*x))/(c + d*x)] - 6*a*d*Log[a + b*x]*Log[(e*(a + b*x))/(c + d
*x)] + 3*a*d*Log[(e*(a + b*x))/(c + d*x)]^2 + 3*b*d*x*Log[(e*(a + b*x))/(c
+ d*x)]^2 - (3*b^2*x*(c + d*x)*Log[(e*(a + b*x))/(c + d*x)]^2)/(a + b*x) -
3*b*c*Log[-(b*c) + a*d]/(d*(a + b*x))*Log[(e*(a + b*x))/(c + d*x)]^2 - a*
d*Log[(e*(a + b*x))/(c + d*x)]^3 + 6*b*c*Log[(e*(a + b*x))/(c + d*x)]*Log[(
b*c - a*d)/(b*c + b*d*x)] - 6*a*d*Log[(e*(a + b*x))/(c + d*x)]*Log[(b*c - a
*d)/(b*c + b*d*x)] + 3*a*d*Log[(e*(a + b*x))/(c + d*x)]^2*Log[(b*c - a*d)/(
b*c + b*d*x)] + 6*(b*c - a*d + a*d*Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2,
(d*(a + b*x))/(b*(c + d*x))] - 6*(b*c - a*d)*PolyLog[2, (b*(c + d*x))/(b*c
- a*d)] + 6*b*c*Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, (b*(c + d*x))/(d*(
a + b*x))] - 6*a*d*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))] + 6*b*c*PolyLog[
3, (b*(c + d*x))/(d*(a + b*x)))]/(b*c - a*d))/(3*b^3*g^2)

```

---

**Maple [F]** time = 3.704, size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2}{(bgx + ag)^2} \left( A + B \ln \left( \frac{e(bx + a)}{dx + c} \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*i\*x+c\*i)^2\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^2,x)

[Out] int((d\*i\*x+c\*i)^2\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^2,x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^2,x, algorithm="maxima")

[Out] 
$$-A^2*(a^2/(b^4*g^2*x + a*b^3*g^2) - x/(b^2*g^2) + 2*a*log(b*x + a)/(b^3*g^2)) * d^2*i^2 + 2*A^2*c*d*i^2*(a/(b^3*g^2*x + a*b^2*g^2) + log(b*x + a)/(b^2*g^2)) - 2*A*B*c^2*i^2*(log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^2*g^2*x + a*b*g^2) + 1/(b^2*g^2*x + a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)*g^2) - d*log(d*x + c)/((b^2*c - a*b*d)*g^2)) - A^2*c^2*i^2/(b^2*g^2*x + a*b*g^2) + (B^2*b^2*d^2*i^2*x^2 + B^2*a*b*d^2*i^2*x - (b^2*c^2*i^2 - 2*a*b*c*d*i^2 + a^2*d^2*i^2)*B^2 + 2*((b^2*c*d*i^2 - a*b*d^2*i^2)*B^2*x + (a*b*c*d*i^2 - a^2*d^2*i^2)*B^2)*log(b*x + a))*log(d*x + c)^2/(b^4*g^2*x + a*b^3*g^2) - integrate(-(B^2*b^3*c^3*i^2*log(e)^2 + (B^2*b^3*d^3*i^2*log(e)^2 + 2*A*B*b^3*d^3*i^2*log(e))*x^3 + 3*(B^2*b^3*c*d^2*i^2*log(e)^2 + 2*A*B*b^3*c*d^2*i^2*log(e))*x^2 + (B^2*b^3*d^3*i^2*x^3 + 3*B^2*b^3*c*d^2*i^2*x^2 + 3*B^2*b^3*c^2*d*i^2*x + B^2*b^3*c^3*i^2)*log(b*x + a)^2 + (3*B^2*b^3*c^2*d*i^2*log(e)^2 + 4*A*B*b^3*c^2*d*i^2*log(e))*x + 2*(B^2*b^3*c^3*i^2*log(e) + (B^2*b^3*d^3*i^2*log(e) + A*B*b^3*d^3*i^2)*x^3 + 3*(B^2*b^3*c*d^2*i^2*log(e) + A*B*b^3*c*d^2*i^2)*x^2 + (3*B^2*b^3*c^2*d*i^2*log(e) + 2*A*B*b^3*c^2*d*i^2)*x)*log(b*x + a) - 2*((A*B*b^3*d^3*i^2 + (i^2*log(e) + i^2)*B^2*b^3*d^3)*x^3 + (b^3*c^3*i^2*log(e) - a*b^2*c^2*d*i^2 + 2*a^2*b*c*d^2*i^2 - a^3*d^3*i^2)*B^2 + (3*A*B*b^3*c*d^2*i^2 + (3*b^3*c*d^2*i^2*log(e) + 2*a*b^2*d^3*i^2)*B^2)*x^2 + (2*A*B*b^3*c^2*d*i^2 + (2*a*b^2*c*d^2*i^2 + (3*i^2*log(e) - i^2)*b^3*c^2*d)*B^2)*x + (B^2*b^3*d^3*i^2*x^3 + (5*b^3*c*d^2*i^2 - 2*a*b^2*d^3*i^2)*B^2*x^2 + (3*b^3*c^2*d*i^2 + 4*a*b^2*c*d^2*i^2 - 4*a^2*b*d^3*i^2)*B^2*x + (b^3*c^3*i^2 + 2*a^2*b*c*d^2*i^2 - 2*a^3*d^3*i^2)*B^2)*log(b*x + a))*log(d*x + c))/(b^5*d*g^2*x^3 + a^2*b^3*c*g^2 + (b^5*c*g^2 + 2*a*b^4*d*g^2)*x^2 + (2*a*b^4*c*g^2 + a^2*b^3*d*g^2)*x), x)$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

integral 
$$\frac{A^2 d^2 i^2 x^2 + 2 A^2 c d i^2 x + A^2 c^2 i^2 + (B^2 d^2 i^2 x^2 + 2 B^2 c d i^2 x + B^2 c^2 i^2) \log\left(\frac{b e x + a e}{d x + c}\right)^2 + 2 (A B d^2 i^2 x^2 + 2 A B c d i^2 x + A^2 B c^2 i^2)}{b^2 g^2 x^2 + 2 a b g^2 x + a^2 g^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x, algorithm="fricas")
```

```
[Out] integral((A^2*d^2*i^2*x^2 + 2*A^2*c*d*i^2*x + A^2*c^2*i^2 + (B^2*d^2*i^2*x^2 + 2*B^2*c*d*i^2*x + B^2*c^2*i^2)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*d^2*i^2*x^2 + 2*A*B*c*d*i^2*x + A*B*c^2*i^2)*log((b*e*x + a*e)/(d*x + c)))/(b^2*g^2*x^2 + 2*a*b*g^2*x + a^2*g^2), x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**2,x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2 \left( B \log\left(\frac{bx+ae}{dx+c}\right) + A \right)^2}{(bgx + ag)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x, algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^2*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g)^2, x)
```

$$3.70 \quad \int \frac{(ci+dx)^2 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)^2}{(ag+bgx)^3} dx$$

**Optimal.** Leaf size=387

$$\frac{2Bd^2i^2 \text{PolyLog}\left(2, \frac{b(c+dx)}{d(a+bx)}\right) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{b^3g^3} + \frac{2B^2d^2i^2 \text{PolyLog}\left(3, \frac{b(c+dx)}{d(a+bx)}\right)}{b^3g^3} - \frac{d^2i^2 \log\left(1 - \frac{b(c+dx)}{d(a+bx)}\right) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^3g^3}$$

[Out]  $(-2*B^2*d*i^2*(c + d*x))/(b^2*g^3*(a + b*x)) - (B^2*i^2*(c + d*x)^2)/(4*b*g^3*(a + b*x)^2) - (2*B*d*i^2*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^2*g^3*(a + b*x)) - (B*i^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*b*g^3*(a + b*x)^2) - (d*i^2*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]^2)/(b^2*g^3*(a + b*x)) - (i^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]^2)/(2*b*g^3*(a + b*x)^2) - (d^2*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]^2*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^3*g^3) + (2*B*d^2*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^3*g^3) + (2*B^2*d^2*i^2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])/(b^3*g^3)$

**Rubi [B]** time = 4.06126, antiderivative size = 932, normalized size of antiderivative = 2.41, number of steps used = 73, number of rules used = 20, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.476$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610}

$$\frac{3B^2d^2 \log^2(a + bx)i^2}{2b^3g^3} - \frac{ABd^2 \log^2(a + bx)i^2}{b^3g^3} - \frac{B^2d^2 \log\left(-\frac{bc-ad}{d(a+bx)}\right) \log^2\left(\frac{e(a+bx)}{c+dx}\right) i^2}{b^3g^3} - \frac{B^2d^2 \log(a + bx) \log^2\left(\frac{e(a+bx)}{c+dx}\right) i^2}{b^3g^3} +$$

Antiderivative was successfully verified.

[In] Int[((c\*i + d\*i\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]^2)/(a\*g + b\*g\*x)^3, x]

[Out]  $(-B^2*(b*c - a*d)^2*i^2)/(4*b^3*g^3*(a + b*x)^2) - (5*B^2*d*(b*c - a*d)*i^2)/(2*b^3*g^3*(a + b*x)) - (5*B^2*d^2*i^2*Log[a + b*x])/(2*b^3*g^3) - (A*B*d^2*i^2*Log[a + b*x]^2)/(b^3*g^3) + (3*B^2*d^2*i^2*Log[a + b*x]^2)/(2*b^3*g^3) - (B^2*d^2*i^2*Log[-((b*c - a*d)/(d*(a + b*x))]) * Log[(e*(a + b*x))/(c + d*x)]^2)/(b^3*g^3) - (B^2*d^2*i^2*Log[a + b*x] * Log[(e*(a + b*x))/(c + d*x)]^2)/(b^3*g^3) - (B*(b*c - a*d)^2*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*b^3*g^3*(a + b*x)^2) - (3*B*d*(b*c - a*d)*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]^2)/(b^3*g^3)$

$$\begin{aligned} & (c + d*x)))/(b^3*g^3*(a + b*x)) - (3*B*d^2*i^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x])))/(b^3*g^3) - ((b*c - a*d)^2*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x]))^2)/(2*b^3*g^3*(a + b*x)^2) - (2*d*(b*c - a*d)*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x]))^2)/(b^3*g^3*(a + b*x)) + (d^2*i^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x]))^2)/(b^3*g^3) + (5*B^2*d^2*i^2*Log[c + d*x])/(2*b^3*g^3) - (3*B^2*d^2*i^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b^3*g^3) + (3*B*d^2*i^2*(A + B*Log[(e*(a + b*x))/(c + d*x]))*Log[c + d*x])/(b^3*g^3) + (3*B^2*d^2*i^2*Log[c + d*x]^2)/(2*b^3*g^3) + (2*A*B*d^2*i^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^3*g^3) - (3*B^2*d^2*i^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^3*g^3) + (2*A*B*d^2*i^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^3*g^3) - (3*B^2*d^2*i^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^3*g^3) - (3*B^2*d^2*i^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(b^3*g^3) + (2*B^2*d^2*i^2*Log[(e*(a + b*x))/(c + d*x])*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^3*g^3) + (2*B^2*d^2*i^2*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^3*g^3) \end{aligned}$$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFX^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFX, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_.))^(m_.)*((c_.) + (d_.)*(x_.))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))])*(b_.)/((f_.) + (g_.)*(x_)), x_Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifierIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] := Dist[1/e, Subst[Int[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_Symbol] := Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol] := Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e, Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_Symbol] := With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g + h*x)^t]^u)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s + 1))/(p*r*(s + 1)*(b*c - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```

Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] := -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q]^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]

```

### Rule 2506

```

Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))
^(q_.)]^(r_.)]^(s_.)*(u_), x_Symbol] := With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]

```

### Rule 6610

```

Int[(u_)*PolyLog[n_, v_], x_Symbol] := With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /; !FalseQ[w]] /; FreeQ[n, x]

```

### Rubi steps



$$\begin{aligned}
\int \frac{(70c + 70dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(ag + bgx)^3} dx &= \int \left( \frac{4900(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2 g^3 (a + bx)^3} + \frac{9800d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^2 g^3 (a + bx)^2} \right) dx \\
&= \frac{(4900d^2) \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{a+bx} dx}{b^2 g^3} + \frac{(9800d(bc - ad)) \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(a+bx)^2} dx}{b^2 g^3} \\
&= -\frac{2450(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3 g^3 (a + bx)^2} - \frac{9800d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^3 (a + bx)} \\
&= -\frac{2450(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3 g^3 (a + bx)^2} - \frac{9800d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^3 (a + bx)} \\
&= -\frac{2450(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3 g^3 (a + bx)^2} - \frac{9800d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^3 (a + bx)} \\
&= -\frac{2450(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3 g^3 (a + bx)^2} - \frac{9800d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^3 (a + bx)} \\
&= -\frac{2450B(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^3 (a + bx)^2} - \frac{14700Bd(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^3 (a + bx)} \\
&= -\frac{2450B(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^3 (a + bx)^2} - \frac{14700Bd(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^3 (a + bx)} \\
&= -\frac{4900B^2 d^2 \log(a + bx) \log^2 \left( \frac{e(a+bx)}{c+dx} \right)}{b^3 g^3} - \frac{2450B(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^3 (a + bx)^2} \\
&= -\frac{1225B^2 (bc - ad)^2}{b^3 g^3 (a + bx)^2} - \frac{12250B^2 d (bc - ad)}{b^3 g^3 (a + bx)} - \frac{12250B^2 d^2 \log(a + bx)}{b^3 g^3} - \frac{4900B^2 d^2 \log^2(a + bx)}{b^3 g^3} \\
&= -\frac{1225B^2 (bc - ad)^2}{b^3 g^3 (a + bx)^2} - \frac{12250B^2 d (bc - ad)}{b^3 g^3 (a + bx)} - \frac{12250B^2 d^2 \log(a + bx)}{b^3 g^3} - \frac{4900B^2 d^2 \log^2(a + bx)}{b^3 g^3} \\
&= -\frac{1225B^2 (bc - ad)^2}{b^3 g^3 (a + bx)^2} - \frac{12250B^2 d (bc - ad)}{b^3 g^3 (a + bx)} - \frac{12250B^2 d^2 \log(a + bx)}{b^3 g^3} - \frac{4900B^2 d^2 \log^2(a + bx)}{b^3 g^3} \\
&= -\frac{1225B^2 (bc - ad)^2}{b^3 g^3 (a + bx)^2} - \frac{12250B^2 d (bc - ad)}{b^3 g^3 (a + bx)} - \frac{12250B^2 d^2 \log(a + bx)}{b^3 g^3} - \frac{4900B^2 d^2 \log^2(a + bx)}{b^3 g^3}
\end{aligned}$$

**Mathematica [B]** time = 7.52191, size = 3965, normalized size = 10.25

Result too large to show

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2)/(a\*g + b\*g\*x)^3,x]

[Out] 
$$-(A^2(b^2c^2 - 2ab^2cd + a^2d^2)i^2)/(2b^3g^3(a + b*x)^2) + (2*(-(A^2b^2cd^2i^2 + aA^2d^2i^2))/(b^3g^3(a + b*x)) + (A^2d^2i^2\text{Log}[a + b*x])/(b^3g^3) + (2AB^2c^2i^2(-(a/b + x)(2\text{Log}[a/b + x] + 4\text{Log}[a/b + x]^2)))/(8(a + b*x)^3\text{Log}[a/b + x]) - ((b(c/d + x))/((-a + (b*c)/d)^3(1 - (b(c/d + x))/(-a + (b*c)/d))) - ((b^2(c/d + x)^2)/((-a + (b*c)/d)^4(1 - (b(c/d + x))/(-a + (b*c)/d))^2) + (2b(c/d + x))/((-a + (b*c)/d)^3(1 - (b(c/d + x))/(-a + (b*c)/d))))*\text{Log}[c/d + x] - \text{Log}[1 - (b(c/d + x))/(-a + (b*c)/d)]/(-a + (b*c)/d)^2)/(2*b - (-\text{Log}[a/b + x] + \text{Log}[c/d + x] + \text{Log}[(a*e)/(c + d*x) + (b*e*x)/(c + d*x)])/(2*b*(a + b*x)^2)))/g^3 + (4AB^2c^2d^2i^2(-(1 + \text{Log}[a/b + x])/(b^2*(a + b*x))) + (a*(1 + 2*\text{Log}[a/b + x]))/(4*b^2*(a + b*x)^2) - (-\text{Log}[c/d + x]/(b*(a + b*x))) + (d*(\text{Log}[a + b*x]/(b*c - a*d) - \text{Log}[c + d*x]/(b*c - a*d)))/b)/b - (a*(\text{Log}[c/d + x] + (d*(a + b*x)*(b*c - a*d + d*(a + b*x)*\text{Log}[a + b*x] - d*(a + b*x)*\text{Log}[c + d*x]))/(b*c - a*d)^2))/(2*b^2*(a + b*x)^2) - ((a + 2*b*x)*(-\text{Log}[a/b + x] + \text{Log}[c/d + x] + \text{Log}[(a*e)/(c + d*x) + (b*e*x)/(c + d*x)]))/(2*b^2*(a + b*x)^2))/g^3 + (2AB^2d^2i^2*(\text{Log}[a/b + x]^2/(2*b^3) + (2*a*(1 + \text{Log}[a/b + x]))/(b^3*(a + b*x)) - (a^2*(1 + 2*\text{Log}[a/b + x]))/(4*b^3*(a + b*x)^2) + (2*a*(-\text{Log}[c/d + x]/(b*(a + b*x))) + (d*(\text{Log}[a + b*x]/(b*c - a*d) - \text{Log}[c + d*x]/(b*c - a*d)))/b))/b^2 + (a^2*(\text{Log}[c/d + x] + (d*(a + b*x)*(b*c - a*d + d*(a + b*x)*\text{Log}[a + b*x] - d*(a + b*x)*\text{Log}[c + d*x]))/(b*c - a*d)^2))/(2*b^3*(a + b*x)^2) + (((a*(3*a + 4*b*x))/(a + b*x)^2 + 2*\text{Log}[a + b*x])*(-\text{Log}[a/b + x] + \text{Log}[c/d + x] + \text{Log}[(a*e)/(c + d*x) + (b*e*x)/(c + d*x)]))/(2*b^3) - ((\text{Log}[c/d + x]*\text{Log}[(a + b*x)/(a - (b*c)/d)])/b + \text{PolyLog}[2, (b*d*(c/d + x))/(b*c - a*d)]/b)/b^2)/g^3 - (B^2*c^2*i^2*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*\text{Log}[a + b*x] + 2*(b*c - a*d)^2*\text{Log}[(e*(a + b*x))/(c + d*x)] + 4*d*(-(b*c) + a*d)*(a + b*x)*\text{Log}[(e*(a + b*x))/(c + d*x)] - 4*d^2*(a + b*x)^2*\text{Log}[a + b*x]*\text{Log}[(e*(a + b*x))/(c + d*x)] + 2*(b*c - a*d)^2*\text{Log}[(e*(a + b*x))/(c + d*x)]^2 + 2*d^2*(a + b*x)^2*\text{Log}[c + d*x] - 4*d*(a + b*x)*(b*c - a*d + d*(a + b*x)*\text{Log}[a + b*x] - d*(a + b*x)*\text{Log}[c + d*x]) - 4*d^2*(a + b*x)^2*\text{Log}[(e*(a + b*x))/(c + d*x)]*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] + 2*d^2*(a + b*x)^2*(\text{Log}[a + b*x]*(\text{Log}[a + b*x] - 2*\text{Log}[(b*(c + d*x))/(b*c - a*d)])) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-(b*c) + a*d)] + 2*d^2*(a + b*x)^2*(\text{Log}[(b*c - a*d)/(b*c + b*d*x)]*(2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] + \text{Log}[(b*c - a*d)/(b*c + b*d*x)])) - 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])))/(4*b*(b*c - a*d)^2*g^3*(a + b*x)^2) + (2*B^2*c*d*i^2*(-((2 + 2*\text{Log}[a/b + x] + \text{Log}[a/b +$$

$$\begin{aligned}
& x]^2)/(b^2*(a + b*x))) + (a*(1 + 2*Log[a/b + x] + 2*Log[a/b + x]^2))/(4*b^2 \\
& *(a + b*x)^2) + 2*(-((1 + Log[a/b + x])/(b^2*(a + b*x))) + (a*(1 + 2*Log[a/ \\
& b + x]))/(4*b^2*(a + b*x)^2) - (-Log[c/d + x]/(b*(a + b*x))) + (d*(Log[a + \\
& b*x]/(b*c - a*d) - Log[c + d*x]/(b*c - a*d)))/b)/b - (a*(Log[c/d + x] + (d \\
& *(a + b*x)*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x] \\
& ))/(b*c - a*d)^2))/(2*b^2*(a + b*x)^2)*(-Log[a/b + x] + Log[c/d + x] + Log \\
& [(a*e)/(c + d*x) + (b*e*x)/(c + d*x)]) - ((a + 2*b*x)*(-Log[a/b + x] + Log[ \\
& c/d + x] + Log[(a*e)/(c + d*x) + (b*e*x)/(c + d*x)])^2)/(2*b^2*(a + b*x)^2) \\
& - 2*((d*(a + b*x)*Log[a/b + x]^2 + 2*((-b*c) + a*d)*Log[c/d + x] + d*(a + \\
& b*x)*(Log[a + b*x] - Log[c + d*x])) - 2*Log[a/b + x]*((b*c - a*d)*Log[c/d \\
& + x] + d*(a + b*x)*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*d*(a + b*x)*PolyLog[ \\
& 2, (d*(a + b*x))/(-b*c) + a*d)]/(2*b^2*(b*c - a*d)*(a + b*x)) + (a*(-(d*( \\
& -b*c) + a*d)*(a + b*x)) + (b*c - a*d)^2*(1 + 2*Log[a/b + x])*Log[c/d + x] \\
& + d^2*(a + b*x)^2*Log[a + b*x] - d^2*(a + b*x)^2*Log[c + d*x] + d*(a + b*x) \\
& *(d*(a + b*x)*Log[a/b + x]^2 + 2*(b*c - a*d)*(1 + Log[a/b + x]) - 2*d*(a + \\
& b*x)*(Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] + PolyLog[2, (d*(a + b*x) \\
& ))/(-b*c) + a*d)])))/(4*b^2*(b*c - a*d)^2*(a + b*x)^2) + (-b*(c + d*x)*L \\
& og[c/d + x]^2) + 2*d*(a + b*x)*Log[c/d + x]*Log[(d*(a + b*x))/(-b*c) + a*d \\
& )) + 2*d*(a + b*x)*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]/(b^2*(b*c - a*d)* \\
& (a + b*x)) - (a*(2*d*(-b*c) + a*d)*(a + b*x)*Log[c/d + x] - (b*c - a*d)^2* \\
& Log[c/d + x]^2 + d^2*(a + b*x)^2*Log[c/d + x]^2 + 2*d^2*(a + b*x)^2*Log[a + \\
& b*x] - 2*d^2*(a + b*x)^2*Log[c/d + x]*Log[(d*(a + b*x))/(-b*c) + a*d] - \\
& 2*d^2*(a + b*x)^2*Log[c + d*x] - 2*d^2*(a + b*x)^2*PolyLog[2, (b*(c + d*x)) \\
& /(-b*c) + a*d)]/(2*b^2*(b*c - a*d)^2*(a + b*x)^2))/g^3 + (B^2*d^2*i^2*(Log \\
& [a/b + x]^3/(3*b^3) + (2*a*(2 + 2*Log[a/b + x] + Log[a/b + x]^2))/(b^3*(a + \\
& b*x)) - (a^2*(1 + 2*Log[a/b + x] + 2*Log[a/b + x]^2))/(4*b^3*(a + b*x)^2) \\
& + (((a*(3*a + 4*b*x))/(a + b*x)^2 + 2*Log[a + b*x])*(-Log[a/b + x] + Log[c/ \\
& d + x] + Log[(a*e)/(c + d*x) + (b*e*x)/(c + d*x)])^2)/(2*b^3) + 2*(-Log[a/b \\
& + x] + Log[c/d + x] + Log[(a*e)/(c + d*x) + (b*e*x)/(c + d*x)]*(Log[a/b + \\
& x]^2/(2*b^3) + (2*a*(1 + Log[a/b + x]))/(b^3*(a + b*x)) - (a^2*(1 + 2*Log[ \\
& a/b + x]))/(4*b^3*(a + b*x)^2) + (2*a*(-Log[c/d + x]/(b*(a + b*x))) + (d*( \\
& Log[a + b*x]/(b*c - a*d) - Log[c + d*x]/(b*c - a*d)))/b)/b^2 + (a^2*(Log[c \\
& /d + x] + (d*(a + b*x)*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)* \\
& Log[c + d*x]))/(b*c - a*d)^2))/(2*b^3*(a + b*x)^2) - ((Log[c/d + x]*Log[(a \\
& + b*x)/(a - (b*c)/d)]/b + PolyLog[2, (b*d*(c/d + x))/(b*c - a*d)]/b)/b^2) \\
& - (2*a*(-b*(c + d*x)*Log[c/d + x]^2) + 2*d*(a + b*x)*Log[c/d + x]*Log[(d*( \\
& a + b*x))/(-b*c) + a*d] + 2*d*(a + b*x)*PolyLog[2, (b*(c + d*x))/(b*c - a \\
& *d)])))/(b^3*(b*c - a*d)*(a + b*x)) + (a^2*(2*d*(-b*c) + a*d)*(a + b*x)*Log \\
& [c/d + x] - (b*c - a*d)^2*Log[c/d + x]^2 + d^2*(a + b*x)^2*Log[c/d + x]^2 + \\
& 2*d^2*(a + b*x)^2*Log[a + b*x] - 2*d^2*(a + b*x)^2*Log[c/d + x]*Log[(d*(a \\
& + b*x))/(-b*c) + a*d] - 2*d^2*(a + b*x)^2*Log[c + d*x] - 2*d^2*(a + b*x)^ \\
& 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(2*b^3*(b*c - a*d)^2*(a + b*x)^2) \\
& - 2*(-((a*(d*(a + b*x)*Log[a/b + x]^2 + 2*((-b*c) + a*d)*Log[c/d + x] + d \\
& *(a + b*x)*(Log[a + b*x] - Log[c + d*x])) - 2*Log[a/b + x]*((b*c - a*d)*Log \\
& [c/d + x] + d*(a + b*x)*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*d*(a + b*x)*Pol
\end{aligned}$$

$y \text{Log}[2, (d*(a + b*x))/(-(b*c) + a*d)]/(b^3*(b*c - a*d)*(a + b*x)) - (a^2 * (-d*(-(b*c) + a*d)*(a + b*x)) + (b*c - a*d)^2*(1 + 2*\text{Log}[a/b + x])*\text{Log}[c/d + x] + d^2*(a + b*x)^2*\text{Log}[a + b*x] - d^2*(a + b*x)^2*\text{Log}[c + d*x] + d*(a + b*x)*(d*(a + b*x)*\text{Log}[a/b + x]^2 + 2*(b*c - a*d)*(1 + \text{Log}[a/b + x]) - 2*d*(a + b*x)*(\text{Log}[a/b + x]*\text{Log}[(b*(c + d*x))/(b*c - a*d]) + \text{PolyLog}[2, (d*(a + b*x))/(-(b*c) + a*d)])))/(4*b^3*(b*c - a*d)^2*(a + b*x)^2) + (\text{Log}[a/b + x]^2*(\text{Log}[c/d + x] - \text{Log}[(b*(c + d*x))/(b*c - a*d)]) - 2*\text{Log}[a/b + x]*\text{PolyLog}[2, (d*(a + b*x))/(-(b*c) + a*d)] + 2*\text{PolyLog}[3, (d*(a + b*x))/(-(b*c) + a*d)])/(2*b^3)) + (\text{Log}[c/d + x]^2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] + 2*\text{Log}[c/d + x]*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)] - 2*\text{PolyLog}[3, (b*(c + d*x))/(b*c - a*d)])/(b^3))/g^3$

**Maple [F]** time = 3.265, size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2}{(bgx + ag)^3} \left( A + B \ln \left( \frac{e(bx + a)}{dx + c} \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*i\*x+c\*i)^2\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^3,x)

[Out] int((d\*i\*x+c\*i)^2\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^3,x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^3,x, algorithm="maxima")

[Out]  $-A*B*c*d*i^2*(2*(2*b*x + a)*\log(b*e*x/(d*x + c) + a*e/(d*x + c)))/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) + (3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*d)*x)/((b^5*c - a*b^4*d)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)*g^3) + 2*(2*b*c*d - a*d^2)*\log(b*x + a)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3) - 2*(2*b*c*d - a*d^2)*\log(d*x + c)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3) + 1/2*A^2*d^2*i^2*((4*a*b*x + 3*a^2)/(b^5*g^3*x^2 + 2*a*b^4*g^3*x + a^2*b^3*g^3) + 2*\log(b*x + a)/(b^3*g^3)) + 1/2*A*B*c^2*$

$$i^2 * ((2*b*d*x - b*c + 3*a*d) / ((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) - 2*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) / (b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) + 2*d^2*\log(b*x + a) / ((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*\log(d*x + c) / ((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3)) - (2*b*x + a)*A^2*c*d*i^2 / (b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) - 1/2*A^2*c^2*i^2 / (b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) - 1/2*(4*(b^2*c*d*i^2 - a*b*d^2*i^2)*B^2*x + (b^2*c^2*i^2 + 2*a*b*c*d*i^2 - 3*a^2*d^2*i^2)*B^2 - 2*(B^2*b^2*d^2*i^2*x^2 + 2*B^2*a*b*d^2*i^2*x + B^2*a^2*d^2*i^2)*\log(b*x + a))*\log(d*x + c)^2 / (b^5*g^3*x^2 + 2*a*b^4*g^3*x + a^2*b^3*g^3) - \integrate(-(3*B^2*b^3*c^2*d*i^2*x*\log(e)^2 + B^2*b^3*c^3*i^2*\log(e)^2 + (B^2*b^3*d^3*i^2*\log(e)^2 + 2*A*B*b^3*d^3*i^2*\log(e))*x^3 + (3*B^2*b^3*c*d^2*i^2*\log(e)^2 + 2*A*B*b^3*c*d^2*i^2*\log(e))*x^2 + (B^2*b^3*d^3*i^2*x^3 + 3*B^2*b^3*c*d^2*i^2*x^2 + 3*B^2*b^3*c^2*d*i^2*x + B^2*b^3*c^3*i^2)*\log(b*x + a)^2 + 2*(3*B^2*b^3*c^2*d*i^2*x*\log(e) + B^2*b^3*c^3*i^2*\log(e) + (B^2*b^3*d^3*i^2*\log(e) + A*B*b^3*d^3*i^2)*x^3 + (3*B^2*b^3*c*d^2*i^2*\log(e) + A*B*b^3*c*d^2*i^2)*x^2)*\log(b*x + a) + ((6*a*b^2*c*d^2*i^2 - 7*a^2*b*d^3*i^2 - (6*i^2*\log(e) - i^2)*b^3*c^2*d)*B^2*x - 2*(B^2*b^3*d^3*i^2*\log(e) + A*B*b^3*d^3*i^2)*x^3 - (2*b^3*c^3*i^2*\log(e) - a*b^2*c^2*d*i^2 - 2*a^2*b*c*d^2*i^2 + 3*a^3*d^3*i^2)*B^2 - 2*(A*B*b^3*c*d^2*i^2 + (2*a*b^2*d^3*i^2 + (3*i^2*\log(e) - 2*i^2)*b^3*c*d^2)*B^2))*x^2 - 2*(2*B^2*b^3*d^3*i^2*x^3 + 3*(b^3*c*d^2*i^2 + a*b^2*d^3*i^2)*B^2*x^2 + 3*(b^3*c^2*d*i^2 + a^2*b*d^3*i^2)*B^2*x + (b^3*c^3*i^2 + a^3*d^3*i^2)*B^2)*\log(b*x + a))*\log(d*x + c)) / (b^6*d*g^3*x^4 + a^3*b^3*c*g^3 + (b^6*c*g^3 + 3*a*b^5*d*g^3)*x^3 + 3*(a*b^5*c*g^3 + a^2*b^4*d*g^3)*x^2 + (3*a^2*b^4*c*g^3 + a^3*b^3*d*g^3)*x), x$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{A^2 d^2 i^2 x^2 + 2 A^2 c d i^2 x + A^2 c^2 i^2 + (B^2 d^2 i^2 x^2 + 2 B^2 c d i^2 x + B^2 c^2 i^2) \log\left(\frac{bex+ae}{dx+c}\right)^2 + 2 (A B d^2 i^2 x^2 + 2 A B c d i^2 x + A^2 B c^2 i^2) \log\left(\frac{bex+ae}{dx+c}\right) + (A^2 B^2 d^2 i^2 x^2 + 2 A^2 B^2 c d i^2 x + A^2 B^2 c^2 i^2) \log^2\left(\frac{bex+ae}{dx+c}\right) + 2 (A^2 B^2 d^2 i^2 x^2 + 2 A^2 B^2 c d i^2 x + A^2 B^2 c^2 i^2) \log\left(\frac{bex+ae}{dx+c}\right) + (A^2 B^2 d^2 i^2 x^2 + 2 A^2 B^2 c d i^2 x + A^2 B^2 c^2 i^2) \log^2\left(\frac{bex+ae}{dx+c}\right)}{b^3 g^3 x^3 + 3 a b^2 g^3 x^2 + 3 a^2 b g^3 x + a^3 g^3} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^3,x, algorithm="fricas")

[Out] integral((A^2\*d^2\*i^2\*x^2 + 2\*A^2\*c\*d\*i^2\*x + A^2\*c^2\*i^2 + (B^2\*d^2\*i^2\*x^2 + 2\*B^2\*c\*d\*i^2\*x + B^2\*c^2\*i^2)\*log((b\*e\*x + a\*e)/(d\*x + c))^2 + 2\*(A\*B\*d^2\*i^2\*x^2 + 2\*A\*B\*c\*d\*i^2\*x + A\*B\*c^2\*i^2)\*log((b\*e\*x + a\*e)/(d\*x + c)))/(b^3\*g^3\*x^3 + 3\*a\*b^2\*g^3\*x^2 + 3\*a^2\*b\*g^3\*x + a^3\*g^3), x)

---

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*\*2\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))\*\*2/(b\*g\*x+a\*g)\*\*3,x)

[Out] Timed out

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2 \left( B \log\left(\frac{(bx+a)e}{dx+c}\right) + A \right)^2}{(bgx + ag)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^3,x, algorithm="giac")

[Out] integrate((d\*i\*x + c\*i)^2\*(B\*log((b\*x + a)\*e/(d\*x + c)) + A)^2/(b\*g\*x + a\*g)^3, x)

$$3.71 \quad \int \frac{(ci+dx)^2 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)^2}{(ag+bgx)^4} dx$$

**Optimal.** Leaf size=147

$$-\frac{i^2(c+dx)^3 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)^2}{3g^4(a+bx)^3(bc-ad)} - \frac{2Bi^2(c+dx)^3 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{9g^4(a+bx)^3(bc-ad)} - \frac{2B^2i^2(c+dx)^3}{27g^4(a+bx)^3(bc-ad)}$$

[Out]  $(-2*B^2*i^2*(c+d*x)^3)/(27*(b*c-a*d)*g^4*(a+b*x)^3) - (2*B*i^2*(c+d*x)^3*(A+B*Log[(e*(a+b*x))/(c+d*x)]))/(9*(b*c-a*d)*g^4*(a+b*x)^3) - (i^2*(c+d*x)^3*(A+B*Log[(e*(a+b*x))/(c+d*x]])^2)/(3*(b*c-a*d)*g^4*(a+b*x)^3)$

**Rubi [C]** time = 3.13179, antiderivative size = 827, normalized size of antiderivative = 5.63, number of steps used = 92, number of rules used = 11, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.262$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2i^2 \log^2(a+bx)d^3}{3b^3(bc-ad)g^4} + \frac{B^2i^2 \log^2(c+dx)d^3}{3b^3(bc-ad)g^4} - \frac{2B^2i^2 \log(a+bx)d^3}{9b^3(bc-ad)g^4} - \frac{2Bi^2 \log(a+bx) \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right) d^3}{3b^3(bc-ad)g^4} + \frac{2B^2i^2 \log(a+bx)}{9b^3(bc-ad)g^4}$$

Antiderivative was successfully verified.

[In] Int[((c\*i + d\*i\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]])^2)/(a\*g + b\*g\*x)^4,x]

[Out]  $(-2*B^2*(b*c-a*d)^2*i^2)/(27*b^3*g^4*(a+b*x)^3) - (2*B^2*d*(b*c-a*d)*i^2)/(9*b^3*g^4*(a+b*x)^2) - (2*B^2*d^2*i^2)/(9*b^3*g^4*(a+b*x)) - (2*B^2*d^3*i^2*Log[a+b*x])/(9*b^3*(b*c-a*d)*g^4) + (B^2*d^3*i^2*Log[a+b*x])^2/(3*b^3*(b*c-a*d)*g^4) - (2*B*(b*c-a*d)^2*i^2*(A+B*Log[(e*(a+b*x))/(c+d*x]]))/(9*b^3*g^4*(a+b*x)^3) - (2*B*d*(b*c-a*d)*i^2*(A+B*Log[(e*(a+b*x))/(c+d*x]]))/(3*b^3*g^4*(a+b*x)^2) - (2*B*d^2*i^2*(A+B*Log[(e*(a+b*x))/(c+d*x]]))/(3*b^3*g^4*(a+b*x)) - (2*B*d^3*i^2*Log[a+b*x]*(A+B*Log[(e*(a+b*x))/(c+d*x]]))/(3*b^3*(b*c-a*d)*g^4) - ((b*c-a*d)^2*i^2*(A+B*Log[(e*(a+b*x))/(c+d*x]]^2)/(3*b^3*g^4*(a+b*x)^3) - (d*(b*c-a*d)*i^2*(A+B*Log[(e*(a+b*x))/(c+d*x]]^2)/(b^3*g^4*(a+b*x)^2) - (d^2*i^2*(A+B*Log[(e*(a+b*x))/(c+d*x]]^2)/(b^3*g^4*(a+b*x))) + (2*B^2*d^3*i^2*Log[c+d*x])/(9*b^3*(b*c-a*d)*g^4) - (2*B^2*d^3*i^2*Log[-((d*(a+b*x))/(b*c-a*d))]*Log[c+d*x])/(3*b^3*(b*c-a*d)*g^4) + (2*B*d^3*i^2*(A+B*Log[(e*(a+b*x))/(c+d*x]])*Log[c+d*x])/(3*b^3*(b*c-a*d)*g^4)$

$$b*c - a*d)*g^4) + (B^2*d^3*i^2*Log[c + d*x]^2)/(3*b^3*(b*c - a*d)*g^4) - (2*B^2*d^3*i^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)]/(3*b^3*(b*c - a*d)*g^4) - (2*B^2*d^3*i^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))]/(3*b^3*(b*c - a*d)*g^4) - (2*B^2*d^3*i^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]/(3*b^3*(b*c - a*d)*g^4)$$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With[
  {u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]
] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(Rfx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, Rfx, x]},
```



Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[  
RFx, x] && IntegerQ[p]

### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.  
)\*(x\_))^(q\_.), x\_Symbol] := Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^  
n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E  
qQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] := Simp[(a + b\*Lo  
g[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_  
)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x  
)^n]))/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x  
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_  
Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x  
, x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*  
(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] := -Simp[PolyLog[2  
, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rubi steps

$$\begin{aligned}
\int \frac{(71c + 71dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(ag + bgx)^4} dx &= \int \left( \frac{5041(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2 g^4 (a + bx)^4} + \frac{10082d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2 g^4 (a + bx)^3} \right) dx \\
&= \frac{(5041d^2) \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(a+bx)^2} dx}{b^2 g^4} + \frac{(10082d(bc - ad)) \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(a+bx)^3} dx}{b^2 g^4} \\
&= -\frac{5041(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{3b^3 g^4 (a + bx)^3} - \frac{5041d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3 g^4 (a + bx)^2} \\
&= -\frac{5041(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{3b^3 g^4 (a + bx)^3} - \frac{5041d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3 g^4 (a + bx)^2} \\
&= -\frac{5041(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{3b^3 g^4 (a + bx)^3} - \frac{5041d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3 g^4 (a + bx)^2} \\
&= -\frac{5041(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{3b^3 g^4 (a + bx)^3} - \frac{5041d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3 g^4 (a + bx)^2} \\
&= -\frac{10082B(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{9b^3 g^4 (a + bx)^3} - \frac{10082Bd(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{3b^3 g^4 (a + bx)^2} \\
&= -\frac{10082B(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{9b^3 g^4 (a + bx)^3} - \frac{10082Bd(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{3b^3 g^4 (a + bx)^2} \\
&= -\frac{10082B(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{9b^3 g^4 (a + bx)^3} - \frac{10082Bd(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{3b^3 g^4 (a + bx)^2} \\
&= -\frac{10082B^2(bc - ad)^2}{27b^3 g^4 (a + bx)^3} - \frac{10082B^2 d(bc - ad)}{9b^3 g^4 (a + bx)^2} - \frac{10082B^2 d^2}{9b^3 g^4 (a + bx)} - \frac{10082B^2 d^3 \log}{9b^3 (bc - ad)} \\
&= -\frac{10082B^2(bc - ad)^2}{27b^3 g^4 (a + bx)^3} - \frac{10082B^2 d(bc - ad)}{9b^3 g^4 (a + bx)^2} - \frac{10082B^2 d^2}{9b^3 g^4 (a + bx)} - \frac{10082B^2 d^3 \log}{9b^3 (bc - ad)} \\
&= -\frac{10082B^2(bc - ad)^2}{27b^3 g^4 (a + bx)^3} - \frac{10082B^2 d(bc - ad)}{9b^3 g^4 (a + bx)^2} - \frac{10082B^2 d^2}{9b^3 g^4 (a + bx)} - \frac{10082B^2 d^3 \log}{9b^3 (bc - ad)} \\
&= -\frac{10082B^2(bc - ad)^2}{27b^3 g^4 (a + bx)^3} - \frac{10082B^2 d(bc - ad)}{9b^3 g^4 (a + bx)^2} - \frac{10082B^2 d^2}{9b^3 g^4 (a + bx)} - \frac{10082B^2 d^3 \log}{9b^3 (bc - ad)}
\end{aligned}$$

**Mathematica [C]** time = 2.20987, size = 1355, normalized size = 9.22

$$i^2 \left( 18 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 (bc - ad)^3 + 54d(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 (bc - ad)^2 - 54d^2(ad - bc)(a + bx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 \right)$$

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))^2)/(a\*g + b\*g\*x)^4,x]

[Out] 
$$-(i^2(18(b^2c - a^2d)^3(A + B \log\left(\frac{e(a + bx)}{c + dx}\right))^2 + 54d(b^2c - a^2d)^2(a + bx)(A + B \log\left(\frac{e(a + bx)}{c + dx}\right))^2 - 54d^2(-(b^2c + a^2d)(a + bx)^2(A + B \log\left(\frac{e(a + bx)}{c + dx}\right))^2 + 54Bd^2(a + bx)^2(2(b^2c - a^2d)(A + B \log\left(\frac{e(a + bx)}{c + dx}\right)) + 2d(a + bx)*\log[a + bx]*(A + B \log\left(\frac{e(a + bx)}{c + dx}\right)) - 2d(a + bx)(A + B \log\left(\frac{e(a + bx)}{c + dx}\right))*\log[c + dx] + 2B(b^2c - a^2d + d(a + bx))*\log[a + bx] - d(a + bx)*\log[c + dx]) - Bd(a + bx)*(\log[a + bx]*(\log[a + bx] - 2\log\left(\frac{b(c + dx)}{b^2c - a^2d}\right)) - 2\text{PolyLog}[2, \frac{d(a + bx)}{-(b^2c + a^2d)}]) + Bd(a + bx)*((2\log\left(\frac{d(a + bx)}{-(b^2c + a^2d)}\right) - \log[c + dx])*\log[c + dx] + 2\text{PolyLog}[2, \frac{b(c + dx)}{b^2c - a^2d}])) + 27Bd(a + bx)*(2(b^2c - a^2d)^2(A + B \log\left(\frac{e(a + bx)}{c + dx}\right)) + 4d(-(b^2c + a^2d)(a + bx)(A + B \log\left(\frac{e(a + bx)}{c + dx}\right)) - 4d^2(a + bx)^2*\log[a + bx]*(A + B \log\left(\frac{e(a + bx)}{c + dx}\right)) + 4d^2(a + bx)^2(A + B \log\left(\frac{e(a + bx)}{c + dx}\right))*\log[c + dx] - 4Bd(a + bx)(b^2c - a^2d + d(a + bx))*\log[a + bx] - d(a + bx)*\log[c + dx]) + B((b^2c - a^2d)^2 + 2d(-(b^2c + a^2d)(a + bx) - 2d^2(a + bx)^2*\log[a + bx] + 2d^2(a + bx)^2*\log[c + dx]) + 2Bd^2(a + bx)^2*(\log[a + bx]*(\log[a + bx] - 2*\log\left(\frac{b(c + dx)}{b^2c - a^2d}\right)) - 2\text{PolyLog}[2, \frac{d(a + bx)}{-(b^2c + a^2d)}])) - 2Bd^2(a + bx)^2*((2\log\left(\frac{d(a + bx)}{-(b^2c + a^2d)}\right) - \log[c + dx])*\log[c + dx] + 2\text{PolyLog}[2, \frac{b(c + dx)}{b^2c - a^2d}])) + B(12(b^2c - a^2d)^3(A + B \log\left(\frac{e(a + bx)}{c + dx}\right)) - 18d(b^2c - a^2d)^2(a + bx)*(A + B \log\left(\frac{e(a + bx)}{c + dx}\right)) + 36d^2(b^2c - a^2d)(a + bx)^2(A + B \log\left(\frac{e(a + bx)}{c + dx}\right)) + 36d^3(a + bx)^3*\log[a + bx]*(A + B \log\left(\frac{e(a + bx)}{c + dx}\right)) - 36d^3(a + bx)^3(A + B \log\left(\frac{e(a + bx)}{c + dx}\right))*\log[c + dx] + 36Bd^2(a + bx)^2(b^2c - a^2d + d(a + bx))*\log[a + bx] - d(a + bx)*\log[c + dx]) - 9Bd(a + bx)*((b^2c - a^2d)^2 + 2d(-(b^2c + a^2d)(a + bx) - 2d^2(a + bx)^2*\log[a + bx] + 2d^2(a + bx)^2*\log[c + dx]) + 2B(2(b^2c - a^2d)^3 - 3d(b^2c - a^2d)^2(a + bx) + 6d^2(b^2c - a^2d)(a + bx)^2 + 6d^3(a + bx)^3*\log[a + bx] - 6d^3(a + bx)^3*\log[c + dx]) - 18Bd^3(a + bx)^3*(\log[a + bx]*(\log[a + bx] - 2*\log\left(\frac{b(c + dx)}{b^2c - a^2d}\right)) - 2\text{PolyLog}[2, \frac{d(a + bx)}{-(b^2c + a^2d)}]) + 18Bd^3(a + bx)^3*((2\log\left(\frac{d(a + bx)}{-(b^2c + a^2d)}\right) - \log[c + dx])*\log[c + dx] + 2\text{PolyLog}[2, \frac{b(c + dx)}{b^2c - a^2d}])))/(54b^3$$

$$(b*c - a*d)*g^4*(a + b*x)^3$$

**Maple [B]** time = 0.055, size = 890, normalized size = 6.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((d*i*x+c*i)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4,x)`

[Out] 
$$\frac{1}{3}e^{3di^2/(ad-bc)^2/g^4A^2/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c}^{3a-1} / 3e^{3i^2/(ad-bc)^2/g^4A^2/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c}^{3b^c+2} / 3e^{3di^2/(ad-bc)^2/g^4AB/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c}^{3\ln(b^e/d+(ad-bc)*e/d/(d*x+c))^a-2} / 3e^{3i^2/(ad-bc)^2/g^4AB/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c}^{3\ln(b^e/d+(ad-bc)*e/d/(d*x+c))^b^c+2} / 9e^{3di^2/(ad-bc)^2/g^4AB/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c}^{3a-2} / 9e^{3i^2/(ad-bc)^2/g^4AB/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c}^{3b^c+1} / 3e^{3di^2/(ad-bc)^2/g^4B^2/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c}^{3\ln(b^e/d+(ad-bc)*e/d/(d*x+c))^2a-1} / 3e^{3i^2/(ad-bc)^2/g^4B^2/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c}^{3\ln(b^e/d+(ad-bc)*e/d/(d*x+c))^2b^c+2} / 9e^{3di^2/(ad-bc)^2/g^4B^2/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c}^{3\ln(b^e/d+(ad-bc)*e/d/(d*x+c))^a-2} / 9e^{3i^2/(ad-bc)^2/g^4B^2/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c}^{3\ln(b^e/d+(ad-bc)*e/d/(d*x+c))^b^c+2} / 27e^{3di^2/(ad-bc)^2/g^4B^2/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c}^{3a-2} / 27e^{3i^2/(ad-bc)^2/g^4B^2/(b^e/d+e/(d*x+c))^a-e/d/(d*x+c)*b^c}^{3b^c}$$

**Maxima [B]** time = 3.36555, size = 7468, normalized size = 50.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4,x, algorithm="maxima")`

[Out] 
$$-1/3*(3*b*x + a)*B^2*c*d*i^2*\log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) - 1/3*(3*b^2*x^2 + 3*a*b*x + a^2)*B^2*d^2*i^2*\log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^6*g^4*x^3 + 3*a*b^5*g^4*x^2 + 3*a^2*b^4*g^4*x + a^3*b^3*g^4) - 1/54*(6*((6*b^2*d$$

$$\begin{aligned}
&^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/(( \\
&b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d \\
&+ a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4 \\
&*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4) + 6*d^3*log(b*x + a)/(( \\
&b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x \\
&+ c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4))*log(b* \\
&e*x/(d*x + c) + a*e/(d*x + c)) + (4*b^3*c^3 - 27*a*b^2*c^2*d + 108*a^2*b*c* \\
&d^2 - 85*a^3*d^3 + 66*(b^3*c*d^2 - a*b^2*d^3)*x^2 - 18*(b^3*d^3*x^3 + 3*a*b \\
&^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a)^2 - 18*(b^3*d^3*x^3 + 3* \\
&a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(d*x + c)^2 - 3*(5*b^3*c^2*d - \\
&54*a*b^2*c*d^2 + 49*a^2*b*d^3)*x + 66*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^ \\
&2*b*d^3*x + a^3*d^3)*log(b*x + a) - 6*(11*b^3*d^3*x^3 + 33*a*b^2*d^3*x^2 + \\
&33*a^2*b*d^3*x + 11*a^3*d^3 - 6*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^ \\
&3*x + a^3*d^3)*log(b*x + a))*log(d*x + c))/(a^3*b^4*c^3*g^4 - 3*a^4*b^3*c^2 \\
&*d*g^4 + 3*a^5*b^2*c*d^2*g^4 - a^6*b*d^3*g^4 + (b^7*c^3*g^4 - 3*a*b^6*c^2*d \\
&*g^4 + 3*a^2*b^5*c*d^2*g^4 - a^3*b^4*d^3*g^4)*x^3 + 3*(a*b^6*c^3*g^4 - 3*a^ \\
&2*b^5*c^2*d*g^4 + 3*a^3*b^4*c*d^2*g^4 - a^4*b^3*d^3*g^4)*x^2 + 3*(a^2*b^5*c \\
&^3*g^4 - 3*a^3*b^4*c^2*d*g^4 + 3*a^4*b^3*c*d^2*g^4 - a^5*b^2*d^3*g^4)*x))*B \\
&^2*c^2*i^2 - 1/54*(6*((5*a*b^2*c^2 - 22*a^2*b*c*d + 5*a^3*d^2 - 6*(3*b^3*c* \\
&d - a*b^2*d^2)*x^2 + 3*(3*b^3*c^2 - 16*a*b^2*c*d + 5*a^2*b*d^2)*x)/((b^7*c^ \\
&2 - 2*a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3*(a*b^6*c^2 - 2*a^2*b^5*c*d + a^3 \\
&*b^4*d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*c*d + a^4*b^3*d^2)*g^4*x + ( \\
&a^3*b^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4) - 6*(3*b*c*d^2 - a*d^3)*log \\
&(b*x + a)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c \\
&d^2 - a^3*b^2*d^3)*g^4))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + (19*a*b^3* \\
&c^3 - 189*a^2*b^2*c^2*d + 189*a^3*b*c*d^2 - 19*a^4*d^3 - 6*(27*b^4*c^2*d - \\
&32*a*b^3*c*d^2 + 5*a^2*b^2*d^3)*x^2 + 18*(3*a^3*b*c*d^2 - a^4*d^3 + (3*b^4* \\
&c*d^2 - a*b^3*d^3)*x^3 + 3*(3*a*b^3*c*d^2 - a^2*b^2*d^3)*x^2 + 3*(3*a^2*b^ \\
&2*c*d^2 - a^3*b*d^3)*x)*log(b*x + a)^2 + 18*(3*a^3*b*c*d^2 - a^4*d^3 + (3*b^ \\
&4*c*d^2 - a*b^3*d^3)*x^3 + 3*(3*a*b^3*c*d^2 - a^2*b^2*d^3)*x^2 + 3*(3*a^2*b \\
&^2*c*d^2 - a^3*b*d^3)*x)*log(d*x + c)^2 + 3*(9*b^4*c^3 - 125*a*b^3*c^2*d + \\
&135*a^2*b^2*c*d^2 - 19*a^3*b*d^3)*x - 6*(27*a^3*b*c*d^2 - 5*a^4*d^3 + (27*b \\
&^4*c*d^2 - 5*a*b^3*d^3)*x^3 + 3*(27*a*b^3*c*d^2 - 5*a^2*b^2*d^3)*x^2 + 3*(2 \\
&7*a^2*b^2*c*d^2 - 5*a^3*b*d^3)*x)*log(b*x + a) + 6*(27*a^3*b*c*d^2 - 5*a^4* \\
&d^3 + (27*b^4*c*d^2 - 5*a*b^3*d^3)*x^3 + 3*(27*a*b^3*c*d^2 - 5*a^2*b^2*d^3) \\
&*x^2 + 3*(27*a^2*b^2*c*d^2 - 5*a^3*b*d^3)*x - 6*(3*a^3*b*c*d^2 - a^4*d^3 + \\
&(3*b^4*c*d^2 - a*b^3*d^3)*x^3 + 3*(3*a*b^3*c*d^2 - a^2*b^2*d^3)*x^2 + 3*(3* \\
&a^2*b^2*c*d^2 - a^3*b*d^3)*x)*log(b*x + a))*log(d*x + c))/(a^3*b^5*c^3*g^4 \\
&- 3*a^4*b^4*c^2*d*g^4 + 3*a^5*b^3*c*d^2*g^4 - a^6*b^2*d^3*g^4 + (b^8*c^3*g^ \\
&4 - 3*a*b^7*c^2*d*g^4 + 3*a^2*b^6*c*d^2*g^4 - a^3*b^5*d^3*g^4)*x^3 + 3*(a*b \\
&^7*c^3*g^4 - 3*a^2*b^6*c^2*d*g^4 + 3*a^3*b^5*c*d^2*g^4 - a^4*b^4*d^3*g^4)*x \\
&^2 + 3*(a^2*b^6*c^3*g^4 - 3*a^3*b^5*c^2*d*g^4 + 3*a^4*b^4*c*d^2*g^4 - a^5*b \\
&^3*d^3*g^4)*x))*B^2*c*d*i^2 - 1/54*(6*((11*a^2*b^2*c^2 - 7*a^3*b*c*d + 2*a^ \\
&4*d^2 + 6*(3*b^4*c^2 - 3*a*b^3*c*d + a^2*b^2*d^2)*x^2 + 3*(9*a*b^3*c^2 - 7*
\end{aligned}$$

$$\begin{aligned}
& a^2 b^2 c^2 d + 2 a^3 b^2 d^2) x) / ((b^8 c^2 - 2 a^2 b^7 c^2 d + a^2 b^6 d^2) g^4 x^3 + 3 (a^2 b^7 c^2 - 2 a^2 b^6 c^2 d + a^3 b^5 d^2) g^4 x^2 + 3 (a^2 b^6 c^2 - 2 a^3 b^5 c^2 d + a^4 b^4 d^2) g^4 x + (a^3 b^5 c^2 - 2 a^4 b^4 c^2 d + a^5 b^3 d^2) g^4) + 6 (3 b^2 c^2 d - 3 a b^2 c^2 d^2 + a^2 d^3) \log(b x + a) / ((b^6 c^3 - 3 a b^5 c^2 d + 3 a^2 b^4 c^2 d^2 - a^3 b^3 d^3) g^4) - 6 (3 b^2 c^2 d - 3 a b^2 c^2 d^2 + a^2 d^3) \log(d x + c) / ((b^6 c^3 - 3 a b^5 c^2 d + 3 a^2 b^4 c^2 d^2 - a^3 b^3 d^3) g^4) * \log(b e^x / (d x + c) + a e / (d x + c)) + (85 a^2 b^3 c^3 - 108 a^3 b^2 c^2 d + 27 a^4 b^2 c^2 d^2 - 4 a^5 d^3 + 6 (18 b^5 c^3 - 27 a b^4 c^2 d + 11 a^2 b^3 c^2 d^2 - 2 a^3 b^2 d^3) x^2 - 18 (3 a^3 b^2 c^2 d - 3 a^4 b^2 c^2 d^2 + a^5 d^3 + (3 b^5 c^2 d - 3 a b^4 c^2 d^2 + a^2 b^3 d^3) x^3 + 3 (3 a b^4 c^2 d - 3 a^2 b^3 c^2 d^2 + a^3 b^2 d^3) x^2 + 3 (3 a^2 b^3 c^2 d - 3 a^3 b^2 c^2 d^2 + a^4 b^2 d^3) x) * \log(b x + a)^2 - 18 (3 a^3 b^2 c^2 d - 3 a^4 b^2 c^2 d^2 + a^5 d^3 + (3 b^5 c^2 d - 3 a b^4 c^2 d^2 + a^2 b^3 d^3) x^3 + 3 (3 a b^4 c^2 d - 3 a^2 b^3 c^2 d^2 + a^3 b^2 d^3) x^2 + 3 (3 a^2 b^3 c^2 d - 3 a^3 b^2 c^2 d^2 + a^4 b^2 d^3) x) * \log(d x + c)^2 + 3 (63 a b^4 c^3 - 86 a^2 b^3 c^2 d + 27 a^3 b^2 c^2 d^2 - 4 a^4 b^2 d^3) x + 6 (18 a^3 b^2 c^2 d - 9 a^4 b^2 c^2 d^2 + 2 a^5 d^3 + (18 b^5 c^2 d - 9 a b^4 c^2 d^2 + 2 a^2 b^3 d^3) x^3 + 3 (18 a b^4 c^2 d - 9 a^2 b^3 c^2 d^2 + 2 a^3 b^2 d^3) x^2 + 3 (18 a^2 b^3 c^2 d - 9 a^3 b^2 c^2 d^2 + 2 a^4 b^2 d^3) x) * \log(b x + a) - 6 (18 a^3 b^2 c^2 d - 9 a^4 b^2 c^2 d^2 + 2 a^5 d^3 + (18 b^5 c^2 d - 9 a b^4 c^2 d^2 + 2 a^2 b^3 d^3) x^3 + 3 (18 a b^4 c^2 d - 9 a^2 b^3 c^2 d^2 + 2 a^3 b^2 d^3) x^2 + 3 (18 a^2 b^3 c^2 d - 9 a^3 b^2 c^2 d^2 + 2 a^4 b^2 d^3) x) * \log(b x + a) * \log(d x + c)) / (a^3 b^6 c^3 g^4 - 3 a^4 b^5 c^2 d g^4 + 3 a^5 b^4 c^2 d^2 g^4 - a^6 b^3 d^3 g^4 + (b^9 c^3 g^4 - 3 a b^8 c^2 d g^4 + 3 a^2 b^7 c^2 d^2 g^4 - a^3 b^6 d^3 g^4) x^3 + 3 (a b^8 c^3 g^4 - 3 a^2 b^7 c^2 d g^4 + 3 a^3 b^6 c^2 d^2 g^4 - a^4 b^5 d^3 g^4) x^2 + 3 (a^2 b^7 c^3 g^4 - 3 a^3 b^6 c^2 d g^4 + 3 a^4 b^5 c^2 d^2 g^4 - a^5 b^4 d^3 g^4) x) * B^2 d^2 i^2 - 1/9 A B d^2 i^2 * (6 (3 b^2 x^2 + 3 a b x + a^2) * \log(b e^x / (d x + c) + a e / (d x + c)) / (b^6 g^4 x^3 + 3 a b^5 g^4 x^2 + 3 a^2 b^4 g^4 x + a^3 b^3 g^4) + (11 a^2 b^2 c^2 - 7 a^3 b^2 c^2 d + 2 a^4 d^2 + 6 (3 b^4 c^2 - 3 a b^3 c^2 d + a^2 b^2 d^2) x^2 + 3 (9 a b^3 c^2 - 7 a^2 b^2 c^2 d + 2 a^3 b^2 d^2) x) / ((b^8 c^2 - 2 a^2 b^7 c^2 d + a^2 b^6 d^2) g^4 x^3 + 3 (a b^7 c^2 - 2 a^2 b^6 c^2 d + a^3 b^5 d^2) g^4 x^2 + 3 (a^2 b^6 c^2 - 2 a^3 b^5 c^2 d + a^4 b^4 d^2) g^4 x + (a^3 b^5 c^2 - 2 a^4 b^4 c^2 d + a^5 b^3 d^2) g^4) + 6 (3 b^2 c^2 d - 3 a b^2 c^2 d^2 + a^2 d^3) * \log(b x + a) / ((b^6 c^3 - 3 a b^5 c^2 d + 3 a^2 b^4 c^2 d^2 - a^3 b^3 d^3) g^4) - 6 (3 b^2 c^2 d - 3 a b^2 c^2 d^2 + a^2 d^3) * \log(d x + c) / ((b^6 c^3 - 3 a b^5 c^2 d + 3 a^2 b^4 c^2 d^2 - a^3 b^3 d^3) g^4)) - 1/9 A B c^2 d i^2 * (6 (3 b x + a) * \log(b e^x / (d x + c) + a e / (d x + c)) / (b^5 g^4 x^3 + 3 a b^4 g^4 x^2 + 3 a^2 b^3 g^4 x + a^3 b^2 g^4) + (5 a b^2 c^2 - 22 a^2 b^2 c^2 d + 5 a^3 d^2 - 6 (3 b^3 c^2 d - a b^2 d^2) x^2 + 3 (3 b^3 c^2 - 16 a b^2 c^2 d + 5 a^2 b^2 d^2) x) / ((b^7 c^2 - 2 a^2 b^6 c^2 d + a^2 b^5 d^2) g^4 x^3 + 3 (a b^6 c^2 - 2 a^2 b^5 c^2 d + a^3 b^4 d^2) g^4 x^2 + 3 (a^2 b^5 c^2 - 2 a^3 b^4 c^2 d + a^4 b^3 d^2) g^4 x + (a^3 b^4 c^2 - 2 a
\end{aligned}$$

$$\begin{aligned}
&^4*b^3*c*d + a^5*b^2*d^2)*g^4) - 6*(3*b*c*d^2 - a*d^3)*\log(b*x + a)/((b^5*c \\
&^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4) + 6*(3*b*c*d^2 - a \\
&*d^3)*\log(d*x + c)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^ \\
&3)*g^4)) - 1/9*A*B*c^2*i^2*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2 \\
&*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^ \\
&4*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^ \\
&2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5 \\
&*b*d^2)*g^4) + 6*\log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^4*g^4*x^3 + 3*a*b^ \\
&3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4) + 6*d^3*\log(b*x + a)/((b^4*c^3 - 3 \\
&*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*\log(d*x + c)/((b^4 \\
&*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4)) - 1/3*B^2*c^2*i^2 \\
&*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3* \\
&a^2*b^2*g^4*x + a^3*b*g^4) - 1/3*(3*b*x + a)*A^2*c*d*i^2/(b^5*g^4*x^3 + 3*a \\
&*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) - 1/3*(3*b^2*x^2 + 3*a*b*x + \\
&a^2)*A^2*d^2*i^2/(b^6*g^4*x^3 + 3*a*b^5*g^4*x^2 + 3*a^2*b^4*g^4*x + a^3*b^3 \\
&*g^4) - 1/3*A^2*c^2*i^2/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + \\
&a^3*b*g^4)
\end{aligned}$$

**Fricas [B]** time = 0.562854, size = 892, normalized size = 6.07

$$3\left((9A^2 + 6AB + 2B^2)b^3cd^2 - (9A^2 + 6AB + 2B^2)ab^2d^3\right)i^2x^2 + 3\left((9A^2 + 6AB + 2B^2)b^3c^2d - (9A^2 + 6AB + 2B^2)ab^2c^2d\right)i^2x^2$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^4,x, alg  
orithm="fricas")

[Out] 
$$\begin{aligned}
&-1/27*(3*((9*A^2 + 6*A*B + 2*B^2)*b^3*c*d^2 - (9*A^2 + 6*A*B + 2*B^2)*a*b^2 \\
&*d^3)*i^2*x^2 + 3*((9*A^2 + 6*A*B + 2*B^2)*b^3*c^2*d - (9*A^2 + 6*A*B + 2*B \\
&^2)*a^2*b*d^3)*i^2*x + ((9*A^2 + 6*A*B + 2*B^2)*b^3*c^3 - (9*A^2 + 6*A*B + \\
&2*B^2)*a^3*d^3)*i^2 + 9*(B^2*b^3*d^3*i^2*x^3 + 3*B^2*b^3*c*d^2*i^2*x^2 + 3* \\
&B^2*b^3*c^2*d*i^2*x + B^2*b^3*c^3*i^2)*\log((b*e*x + a*e)/(d*x + c))^2 + 6*( \\
&(3*A*B + B^2)*b^3*d^3*i^2*x^3 + 3*(3*A*B + B^2)*b^3*c*d^2*i^2*x^2 + 3*(3*A* \\
&B + B^2)*b^3*c^2*d*i^2*x + (3*A*B + B^2)*b^3*c^3*i^2)*\log((b*e*x + a*e)/(d* \\
&x + c)))/((b^7*c - a*b^6*d)*g^4*x^3 + 3*(a*b^6*c - a^2*b^5*d)*g^4*x^2 + 3*( \\
&a^2*b^5*c - a^3*b^4*d)*g^4*x + (a^3*b^4*c - a^4*b^3*d)*g^4)
\end{aligned}$$

**Sympy [B]** time = 69.1096, size = 1178, normalized size = 8.01

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*\*2\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))\*\*2/(b\*g\*x+a\*g)\*\*4,x)

[Out] 
$$-2*B*d^{3*i}*(3*A + B)*\log(x + (6*A*B*a*d^{4*i} + 6*A*B*b*c*d^{3*i} + 2*B^{2*a}d^{4*i} + 2*B^{2*b}c*d^{3*i} - 2*B*a^{2*d}d^{5*i}*(3*A + B)/(a*d - b*c) + 4*B*a*b*c*d^{4*i}*(3*A + B)/(a*d - b*c) - 2*B*b^{2*c}d^{3*i}*(3*A + B)/(a*d - b*c))/(12*A*B*b*d^{4*i} + 4*B^{2*b}d^{4*i}))/(9*b^{3*g}*(a*d - b*c) + 2*B*d^{3*i}*(3*A + B)*\log(x + (6*A*B*a*d^{4*i} + 6*A*B*b*c*d^{3*i} + 2*B^{2*a}d^{4*i} + 2*B^{2*b}c*d^{3*i} + 2*B*a^{2*d}d^{5*i}*(3*A + B)/(a*d - b*c) - 4*B*a*b*c*d^{4*i}*(3*A + B)/(a*d - b*c) + 2*B*b^{2*c}d^{3*i}*(3*A + B)/(a*d - b*c))/(12*A*B*b*d^{4*i} + 4*B^{2*b}d^{4*i}))/(9*b^{3*g}*(a*d - b*c)) + (B^{2*c}d^{3*i} + 3*B^{2*c}d^{2*i}x + 3*B^{2*c}d^{2*i}x^2 + B^{2*d}d^{3*i}x^3)*\log(e*(a + b*x)/(c + d*x))**2/(3*a^{4*d}g^{4*x} - 3*a^{3*b}c*g^{4*x} + 9*a^{3*b}d*g^{4*x} - 9*a^{2*b}b^{2*c}g^{4*x} + 9*a^{2*b}d*g^{4*x} - 9*a*b^{3*c}g^{4*x} + 3*a*b^{3*d}g^{4*x} - 3*b^{4*c}g^{4*x}) - (9*A^{2*a}d^{2*i} + 9*A^{2*a}b*c*d^{i} + 9*A^{2*b}c^{2*i} + 6*A*B*a^{2*d}d^{2*i} + 6*A*B*a*b*c*d^{i} + 6*A*B*b^{2*c}d^{2*i} + 2*B^{2*a}d^{2*i} + 2*B^{2*a}b*c*d^{i} + 2*B^{2*b}b^{2*c}d^{2*i} + x^{2*(27*A^{2*b}d^{2*i} + 18*A*B*b^{2*d}d^{2*i} + 6*B^{2*b}d^{2*i})} + x^{2*(27*A^{2*a}b*d^{2*i} + 27*A^{2*b}c*d^{i} + 18*A*B*a*b*d^{2*i} + 18*A*B*b^{2*c}d^{i} + 6*B^{2*a}b*d^{2*i} + 6*B^{2*b}b^{2*c}d^{i})})/(27*a^{3*b}b^{3*g} + 81*a^{2*b}g^{4*x} + 81*a*b^{5*g}g^{4*x} + 27*b^{6*g}g^{4*x}) + (-6*A*B*a^{2*d}d^{2*i} - 6*A*B*a*b*c*d^{i} - 18*A*B*a*b*d^{2*i}x - 6*A*B*b^{2*c}d^{2*i} - 18*A*B*b^{2*c}d^{i}x - 18*A*B*b^{2*d}d^{2*i}x^2 - 2*B^{2*a}d^{2*i} - 2*B^{2*a}b*c*d^{i} - 6*B^{2*a}b*d^{2*i}x - 2*B^{2*b}b^{2*c}d^{2*i} - 6*B^{2*b}b^{2*c}d^{i}x - 6*B^{2*b}d^{2*i}x^2)*\log(e*(a + b*x)/(c + d*x))/(9*a^{3*b}b^{3*g} + 27*a^{2*b}b^{4*g}g^{4*x} + 27*a*b^{5*g}g^{4*x} + 9*b^{6*g}g^{4*x})$$

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2 \left( B \log \left( \frac{bx+a}{dx+c} \right) + A \right)^2}{(bgx + ag)^4} dx$$

Verification of antiderivative is not currently implemented for this CAS.



```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4,x, algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^2*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g)^4, x)
```

$$3.72 \quad \int \frac{(ci+dx)^2 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)^2}{(ag+bgx)^5} dx$$

**Optimal.** Leaf size=299

$$\frac{bi^2(c+dx)^4 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)^2}{4g^5(a+bx)^4(bc-ad)^2} - \frac{bBi^2(c+dx)^4 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{8g^5(a+bx)^4(bc-ad)^2} + \frac{di^2(c+dx)^3 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)^2}{3g^5(a+bx)^3(bc-ad)^2} + \frac{2Bdi^2(c+dx)^2 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{4g^5(a+bx)^2(bc-ad)^2}$$

[Out]  $(2*B^2*d*i^2*(c+d*x)^3)/(27*(b*c-a*d)^2*g^5*(a+b*x)^3) - (b*B^2*i^2*(c+d*x)^4)/(32*(b*c-a*d)^2*g^5*(a+b*x)^4) + (2*B*d*i^2*(c+d*x)^3*(A+B*Log[(e*(a+b*x))/(c+d*x)]))/(9*(b*c-a*d)^2*g^5*(a+b*x)^3) - (b*B*i^2*(c+d*x)^4*(A+B*Log[(e*(a+b*x))/(c+d*x)]))/(8*(b*c-a*d)^2*g^5*(a+b*x)^4) + (d*i^2*(c+d*x)^3*(A+B*Log[(e*(a+b*x))/(c+d*x]])^2)/(3*(b*c-a*d)^2*g^5*(a+b*x)^3) - (b*i^2*(c+d*x)^4*(A+B*Log[(e*(a+b*x))/(c+d*x]])^2)/(4*(b*c-a*d)^2*g^5*(a+b*x)^4)$

**Rubi [C]** time = 3.69071, antiderivative size = 920, normalized size of antiderivative = 3.08, number of steps used = 104, number of rules used = 11, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.262$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{B^2i^2 \log^2(a+bx)d^4}{12b^3(bc-ad)^2g^5} - \frac{B^2i^2 \log^2(c+dx)d^4}{12b^3(bc-ad)^2g^5} + \frac{7B^2i^2 \log(a+bx)d^4}{72b^3(bc-ad)^2g^5} + \frac{Bi^2 \log(a+bx) \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right) d^4}{6b^3(bc-ad)^2g^5} - \frac{7B^2i^2 \log(a+bx)d^4}{72b^3(bc-ad)^2g^5}$$

Antiderivative was successfully verified.

[In] Int[((c\*i + d\*i\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]])^2)/(a\*g + b\*g\*x)^5, x]

[Out]  $-(B^2*(b*c-a*d)^2*i^2)/(32*b^3*g^5*(a+b*x)^4) - (11*B^2*d*(b*c-a*d)*i^2)/(216*b^3*g^5*(a+b*x)^3) + (5*B^2*d^2*i^2)/(144*b^3*g^5*(a+b*x)^2) + (7*B^2*d^3*i^2)/(72*b^3*(b*c-a*d)*g^5*(a+b*x)) + (7*B^2*d^4*i^2*Log[a+b*x])/(72*b^3*(b*c-a*d)^2*g^5) - (B^2*d^4*i^2*Log[a+b*x]^2)/(12*b^3*(b*c-a*d)^2*g^5) - (B*(b*c-a*d)^2*i^2*(A+B*Log[(e*(a+b*x))/(c+d*x]]))/(8*b^3*g^5*(a+b*x)^4) - (5*B*d*(b*c-a*d)*i^2*(A+B*Log[(e*(a+b*x))/(c+d*x]]))/(18*b^3*g^5*(a+b*x)^3) - (B*d^2*i^2*(A+B*Log[(e*(a+b*x))/(c+d*x]]))/(12*b^3*g^5*(a+b*x)^2) + (B*d^3*i^2*(A+B*Log[(e*(a+b*x))/(c+d*x]]))/(6*b^3*(b*c-a*d)*g^5*(a+b*x)) + (B*d^4*i^2*Log[a+b*x]*(A+B*Log[(e*(a+b*x))/(c+d*x]]))/(6*b^3*(b*c-a*d)^2*g^5) - ((b*c-a*d)^2*i^2*(A+B*Log[(e*(a+b*x))/(c+d*x]]^2)/(4*b^3*g^5*(a+b*x)^4)$

$$\begin{aligned} & - (2*d*(b*c - a*d)*i^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x]))^2)/(3*b^3*g^5 \\ & *(a + b*x)^3 - (d^2*i^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x]))^2)/(2*b^3*g^5 \\ & *(a + b*x)^2 - (7*B^2*d^4*i^2*\text{Log}[c + d*x])/(72*b^3*(b*c - a*d)^2*g^5) + ( \\ & B^2*d^4*i^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/(6*b^3*(b*c - a \\ & *d)^2*g^5) - (B*d^4*i^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x]))*\text{Log}[c + d*x])/ \\ & (6*b^3*(b*c - a*d)^2*g^5) - (B^2*d^4*i^2*\text{Log}[c + d*x]^2)/(12*b^3*(b*c - a*d \\ & )^2*g^5) + (B^2*d^4*i^2*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)])/(6*b^3 \\ & *(b*c - a*d)^2*g^5) + (B^2*d^4*i^2*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))] \\ & )/(6*b^3*(b*c - a*d)^2*g^5) + (B^2*d^4*i^2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - \\ & a*d)])/(6*b^3*(b*c - a*d)^2*g^5) \end{aligned}$$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*Rfx^p])^n - 1)*D[Rfx, x])/Rfx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_.))^(m_.)*((c_.) + (d_.)*(x_.))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_.)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /;
```

FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

### Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*(RFx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]

### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.)\*(x\_))^(q\_.), x\_Symbol] := Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] := Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n]))/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] := -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rubi steps

$$\begin{aligned}
\int \frac{(72c + 72dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(ag + bgx)^5} dx &= \int \left( \frac{5184(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2 g^5 (a + bx)^5} + \frac{10368d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2 g^5 (a + bx)^4} \right) dx \\
&= \frac{(5184d^2) \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(a+bx)^3} dx}{b^2 g^5} + \frac{(10368d(bc - ad)) \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(a+bx)^4} dx}{b^2 g^5} \\
&= -\frac{1296(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3 g^5 (a + bx)^4} - \frac{3456d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3 g^5 (a + bx)^3} \\
&= -\frac{1296(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3 g^5 (a + bx)^4} - \frac{3456d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3 g^5 (a + bx)^3} \\
&= -\frac{1296(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3 g^5 (a + bx)^4} - \frac{3456d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3 g^5 (a + bx)^3} \\
&= -\frac{1296(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3 g^5 (a + bx)^4} - \frac{3456d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3 g^5 (a + bx)^3} \\
&= -\frac{648B(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^5 (a + bx)^4} - \frac{1440Bd(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^5 (a + bx)^3} \\
&= -\frac{648B(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^5 (a + bx)^4} - \frac{1440Bd(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^5 (a + bx)^3} \\
&= -\frac{648B(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^5 (a + bx)^4} - \frac{1440Bd(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^5 (a + bx)^3} \\
&= -\frac{162B^2(bc - ad)^2}{b^3 g^5 (a + bx)^4} - \frac{264B^2d(bc - ad)}{b^3 g^5 (a + bx)^3} + \frac{180B^2d^2}{b^3 g^5 (a + bx)^2} + \frac{504B^2d^3}{b^3 (bc - ad)g^5 (a + bx)} \\
&= -\frac{162B^2(bc - ad)^2}{b^3 g^5 (a + bx)^4} - \frac{264B^2d(bc - ad)}{b^3 g^5 (a + bx)^3} + \frac{180B^2d^2}{b^3 g^5 (a + bx)^2} + \frac{504B^2d^3}{b^3 (bc - ad)g^5 (a + bx)} \\
&= -\frac{162B^2(bc - ad)^2}{b^3 g^5 (a + bx)^4} - \frac{264B^2d(bc - ad)}{b^3 g^5 (a + bx)^3} + \frac{180B^2d^2}{b^3 g^5 (a + bx)^2} + \frac{504B^2d^3}{b^3 (bc - ad)g^5 (a + bx)} \\
&= -\frac{162B^2(bc - ad)^2}{b^3 g^5 (a + bx)^4} - \frac{264B^2d(bc - ad)}{b^3 g^5 (a + bx)^3} + \frac{180B^2d^2}{b^3 g^5 (a + bx)^2} + \frac{504B^2d^3}{b^3 (bc - ad)g^5 (a + bx)}
\end{aligned}$$

**Mathematica [C]** time = 3.10902, size = 1788, normalized size = 5.98

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(a*g + b*g*x)^5,x]
```

```
[Out] -(i^2*(216*(b*c - a*d)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - 576*d*(-(b*c) + a*d)^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 432*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + 216*B*d^2*(a + b*x)^2*(2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 4*d*(-(b*c) + a*d)*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 4*d^2*(a + b*x)^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 4*d^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] - 4*B*d*(a + b*x)*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) + B*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) + 2*B*d^2*(a + b*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 2*B*d^2*(a + b*x)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 32*B*d*(a + b*x)*(12*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 18*d*(b*c - a*d)^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 36*d^2*(b*c - a*d)*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 36*d^3*(a + b*x)^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 36*d^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + 36*B*d^2*(a + b*x)^2*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - 9*B*d*(a + b*x)*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) + 2*B*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) - 18*B*d^3*(a + b*x)^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 18*B*d^3*(a + b*x)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 3*B*(36*(b*c - a*d)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 48*d*(-(b*c) + a*d)^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 72*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 144*d^3*(-(b*c) + a*d)*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 144*d^4*(a + b*x)^4*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 144*d^4*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] - 144*B*d^3*(a + b*x)^3*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) + 36*B*d^2*(a + b*x)^2*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) - 8*B*d*(a + b*x)*
```

$$2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*\text{Log}[a + b*x] - 6*d^3*(a + b*x)^3*\text{Log}[c + d*x]) + 3*B*(3*(b*c - a*d)^4 + 4*d*(-(b*c) + a*d)^3*(a + b*x) + 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 12*d^3*(-(b*c) + a*d)*(a + b*x)^3 - 12*d^4*(a + b*x)^4*\text{Log}[a + b*x] + 12*d^4*(a + b*x)^4*\text{Log}[c + d*x]) + 72*B*d^4*(a + b*x)^4*(\text{Log}[a + b*x]*(\text{Log}[a + b*x] - 2*\text{Log}[(b*(c + d*x))/(b*c - a*d)]) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 72*B*d^4*(a + b*x)^4*((2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] - \text{Log}[c + d*x])*\text{Log}[c + d*x] + 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])))/(864*b^3*(b*c - a*d)^2*g^5*(a + b*x)^4$$

**Maple [B]** time = 0.053, size = 1814, normalized size = 6.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In]  $\text{int}((d*i*x+c*i)^2*(A+B*\ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5, x)$

[Out]  $\frac{1}{3}e^3d^2i^2/(ad-bc)^3/g^5A^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a - \frac{1}{3}e^3d^2i^2/(ad-bc)^3/g^5A^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*b*c - \frac{1}{4}e^4d^2i^2/(ad-bc)^3/g^5A^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4 * a + \frac{1}{4}e^4i^2/(ad-bc)^3/g^5A^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4 * c + \frac{2}{3}e^3d^2i^2/(ad-bc)^3/g^5A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3 * \ln(b*e/d+(ad-bc)*e/d/(d*x+c))^a - \frac{2}{3}e^3d^2i^2/(ad-bc)^3/g^5A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3 * \ln(b*e/d+(ad-bc)*e/d/(d*x+c))^b*c + \frac{2}{9}e^3d^2i^2/(ad-bc)^3/g^5A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3 * a - \frac{2}{9}e^3d^2i^2/(ad-bc)^3/g^5A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3 * b*c - \frac{1}{2}e^4d^2i^2/(ad-bc)^3/g^5A*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4 * \ln(b*e/d+(ad-bc)*e/d/(d*x+c))^a + \frac{1}{2}e^4i^2/(ad-bc)^3/g^5A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4 * \ln(b*e/d+(ad-bc)*e/d/(d*x+c))^c - \frac{1}{8}e^4d^2i^2/(ad-bc)^3/g^5A*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4 * a + \frac{1}{8}e^4i^2/(ad-bc)^3/g^5A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4 * c + \frac{1}{3}e^3d^2i^2/(ad-bc)^3/g^5B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3 * \ln(b*e/d+(ad-bc)*e/d/(d*x+c))^2 * a - \frac{1}{3}e^3d^2i^2/(ad-bc)^3/g^5B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3 * \ln(b*e/d+(ad-bc)*e/d/(d*x+c))^2 * b*c + \frac{2}{9}e^3d^2i^2/(ad-bc)^3/g^5B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3 * \ln(b*e/d+(ad-bc)*e/d/(d*x+c))^2 * b*c + \frac{2}{27}e^3d^2i^2/(ad-bc)^3/g^5B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3 * a - \frac{2}{27}e^3d^2i^2/(ad-bc)^3/g^5B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3 * b*c - \frac{1}{4}e^4d^2i^2/(ad-bc)^3/g^5B^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4 * \ln(b*e/d+(ad-bc)*e/d/(d*x+c))^2 * a + \frac{1}{4}e^4i^2/(ad-bc)^3/g^5B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4 * \ln(b*e/d+(ad-bc)*e/d/(d*x+c))^2 * a + \frac{1}{4}e^4i^2/(ad-bc)^3/g^5B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4 * \ln(b*e/d+(ad-bc)*e/d/(d*x+c))^2 * a + \frac{1}{4}e^4i^2/(ad-bc)^3/g^5B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4 * \ln(b*e/d+(ad-bc)*e/d/(d*x+c))^2 * c$

$$\begin{aligned} & d*x+c)*b*c)^4*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-1/8*e^4*d*i^2/(a*d-b*c)^3 \\ & /g^5*B^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*\ln(b*e/d+(a*d-b*c)*e/d/(d* \\ & x+c))*a+1/8*e^4*i^2/(a*d-b*c)^3/g^5*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)* \\ & b*c)^4*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-1/32*e^4*d*i^2/(a*d-b*c)^3/g^5*B^2 \\ & *b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a+1/32*e^4*i^2/(a*d-b*c)^3/g^5*B^2 \\ & *b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*c \end{aligned}$$

**Maxima [B]** time = 4.87487, size = 10842, normalized size = 36.26

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^5,x, alg orithm="maxima")

[Out] 
$$\begin{aligned} & -1/6*(4*b*x + a)*B^2*c*d*i^2*\log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^6*g^5*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g^5) \\ & - 1/12*(6*b^2*x^2 + 4*a*b*x + a^2)*B^2*d^2*i^2*\log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^7*g^5*x^4 + 4*a*b^6*g^5*x^3 + 6*a^2*b^5*g^5*x^2 + 4*a^3*b^4*g^5*x + a^4*b^3*g^5) \\ & + 1/288*(12*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 25*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2 + 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - (9*b^4*c^4 - 64*a*b^3*c^3*d + 216*a^2*b^2*c^2*d^2 - 576*a^3*b*c*d^3 + 415*a^4*d^4 - 300*(b^4*c*d^3 - a*b^3*d^4)*x^3 + 6*(13*b^4*c^2*d^2 - 176*a*b^3*c*d^3 + 163*a^2*b^2*d^4)*x^2 + 72*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a)^2 + 72*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(d*x + c)^2 - 4*(7*b^4*c^3*d - 60*a*b^3*c^2*d^2 + 324*a^2*b^2*c*d^3 - 271*a^3*b*d^4)*x - 300*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a) + 12*(25*b^4*d^4*x^4 + 100*a*b^3*d^4*x^3 + 150*a^2*b^2*d^4*x^2 + 100*a^3*b*d^4*x + 25*a^4*d^4 - 12*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a))*log(d*x + c))/(a^4*b^5*c^4*g^5 - 4*a^5*b^4*c^3*d*g^5 + 6*a^6*b^3*c^2*d^2*g^5 - 4*a^7*b^2*c*d^3*g^5 + a^8*b*d^4*g^5) \end{aligned}$$



$$\begin{aligned}
&^5 + (b^9c^4g^5 - 4a^2b^8c^3d^2g^5 + 6a^2b^7c^2d^2g^5 - 4a^3b^6c^2d^3g^5 + a^4b^5d^4g^5)x^4 + 4*(a^2b^8c^4g^5 - 4a^2b^7c^3d^2g^5 + \\
&6a^3b^6c^2d^2g^5 - 4a^4b^5c^3d^3g^5 + a^5b^4d^4g^5)x^3 + 6*(a^2b^7c^4g^5 - 4a^3b^6c^3d^2g^5 + 6a^4b^5c^2d^2g^5 - 4a^5b^4c^3d^3g^5 + \\
&a^6b^3d^4g^5)x^2 + 4*(a^3b^6c^4g^5 - 4a^4b^5c^3d^2g^5 + 6a^5b^4c^2d^2g^5 - 4a^6b^3c^3d^3g^5 + a^7b^2d^4g^5)x) * B^2c^2i \\
&^2 - 1/432*(12*((7a^2b^3c^3 - 33a^2b^2c^2d + 75a^3b^3c^2d^2 - 13a^4d^3 + 12*(4b^4c^2d^2 - ab^3d^3))x^3 - 6*(4b^4c^2d - 29a^2b^3c^2d^2 + 7 \\
&a^2b^2d^3)x^2 + 4*(4b^4c^3 - 21a^2b^3c^2d + 57a^2b^2c^2d^2 - 13a^3b^2d^3)x) / ((b^9c^3 - 3a^2b^8c^2d + 3a^2b^7c^2d^2 - a^3b^6d^3)g^5 \\
&x^4 + 4*(a^2b^8c^3 - 3a^2b^7c^2d + 3a^3b^6c^2d^2 - a^4b^5d^3)g^5x^3 + 6*(a^2b^7c^3 - 3a^3b^6c^2d + 3a^4b^5c^2d^2 - a^5b^4d^3)g^5 \\
&x^2 + 4*(a^3b^6c^3 - 3a^4b^5c^2d + 3a^5b^4c^2d^2 - a^6b^3d^3)g^5x + (a^4b^5c^3 - 3a^5b^4c^2d + 3a^6b^3c^2d^2 - a^7b^2d^3)g^5) \\
&+ 12*(4b^3c^2d^3 - a^2d^4)*log(b*x + a) / ((b^6c^4 - 4a^2b^5c^3d + 6a^2b^4c^2d^2 - 4a^3b^3c^2d^3 + a^4b^2d^4)g^5) - 12*(4b^3c^2d^3 - a^2d^4)*log \\
&(d*x + c) / ((b^6c^4 - 4a^2b^5c^3d + 6a^2b^4c^2d^2 - 4a^3b^3c^2d^3 + a^4b^2d^4)g^5) * log(b*e*x / (d*x + c) + a*e / (d*x + c)) + (37a^2b^4c^4 - \\
&304a^2b^3c^3d + 1512a^3b^2c^2d^2 - 1360a^4b^3c^2d^3 + 115a^5d^4 + 12*(88b^5c^2d^2 - 101a^2b^4c^2d^3 + 13a^2b^3d^4)x^3 - 6*(40b^5c^3 \\
&d - 609a^2b^4c^2d^2 + 648a^2b^3c^2d^3 - 79a^3b^2d^4)x^2 - 72*(4a^4b^3c^2d^3 - a^5d^4 + (4b^5c^2d^3 - a^2b^4d^4)x^4 + 4*(4a^2b^4c^2d^3 - a^ \\
&2b^3d^4)x^3 + 6*(4a^2b^3c^2d^3 - a^3b^2d^4)x^2 + 4*(4a^3b^2c^2d^3 - a^4b^2d^4)x) * log(b*x + a)^2 - 72*(4a^4b^3c^2d^3 - a^5d^4 + (4b^5c^2d^ \\
&3 - a^2b^4d^4)x^4 + 4*(4a^2b^4c^2d^3 - a^2b^3d^4)x^3 + 6*(4a^2b^3c^2d^3 - a^3b^2d^4)x^2 + 4*(4a^3b^2c^2d^3 - a^4b^2d^4)x) * log(d*x + c)^2 + \\
&4*(16b^5c^4 - 163a^2b^4c^3d + 1068a^2b^3c^2d^2 - 1036a^3b^2c^2d^3 + 115a^4b^2d^4)x + 12*(88a^4b^3c^2d^3 - 13a^5d^4 + (88b^5c^2d^3 - 13 \\
&a^2b^4d^4)x^4 + 4*(88a^2b^4c^2d^3 - 13a^2b^3d^4)x^3 + 6*(88a^2b^3c^2d^3 - 13a^3b^2d^4)x^2 + 4*(88a^3b^2c^2d^3 - 13a^4b^2d^4)x) * log(b*x \\
&+ a) - 12*(88a^4b^3c^2d^3 - 13a^5d^4 + (88b^5c^2d^3 - 13a^2b^4d^4)x^4 + 4*(88a^2b^4c^2d^3 - 13a^2b^3d^4)x^3 + 6*(88a^2b^3c^2d^3 - 13a^3b^ \\
&^2d^4)x^2 + 4*(88a^3b^2c^2d^3 - 13a^4b^2d^4)x - 12*(4a^4b^3c^2d^3 - a^5d^4 + (4b^5c^2d^3 - a^2b^4d^4)x^4 + 4*(4a^2b^4c^2d^3 - a^2b^3d^4)x^ \\
&3 + 6*(4a^2b^3c^2d^3 - a^3b^2d^4)x^2 + 4*(4a^3b^2c^2d^3 - a^4b^2d^4)x) * log(b*x + a) * log(d*x + c) / (a^4b^6c^4g^5 - 4a^5b^5c^3d^2g^5 + 6a^6b^4c^2d^2g^5 - \\
&4a^7b^3c^2d^3g^5 + a^8b^2d^4g^5 + (b^10c^4g^5 - 4a^2b^9c^3d^2g^5 + 6a^2b^8c^2d^2g^5 - 4a^3b^7c^2d^3g^5 + a^4b^6d^4g^5)x^4 + 4*(a^2b^9c^4g^5 - 4a^2b^8c^3d^2g^5 + 6a^3b^7c^2d^2 \\
&g^5 - 4a^4b^6c^3d^3g^5 + a^5b^5d^4g^5)x^3 + 6*(a^2b^8c^4g^5 - 4a^3b^7c^3d^2g^5 + 6a^4b^6c^2d^2g^5 - 4a^5b^5c^2d^3g^5 + a^6b^4d^4g^5)x^2 + 4*(a^3b^7c^4g^5 - 4a^4b^6c^3d^2g^5 + 6a^5b^5c^2d^2g^5 - \\
&4a^6b^4c^3d^3g^5 + a^7b^3d^4g^5)x) * B^2c^2d^2i^2 - 1/864*(12*((13a^2b^3c^3 - 75a^3b^2c^2d + 33a^4b^3c^2d^2 - 7a^5d^3 - 12*(6b^5c^2d - 4a^2b^4c^2d + \\
&a^2b^3d^3))x^3 + 6*(6b^5c^3 - 46a^2b^4c^2d +
\end{aligned}$$

$$\begin{aligned}
& 29a^2b^3c^2d^2 - 7a^3b^2d^3) * x^2 + 4 * (10a^4b^3c^2d^2 - 63a^2b^3c^2d^2 \\
& + 33a^3b^2c^2d^2 - 7a^4b^2d^3) * x) / ((b^{10}c^3 - 3a^2b^9c^2d + 3a^2b^8 \\
& * c^2d^2 - a^3b^7d^3) * g^5 * x^4 + 4 * (a^2b^9c^3 - 3a^2b^8c^2d + 3a^3b^7c \\
& * d^2 - a^4b^6d^3) * g^5 * x^3 + 6 * (a^2b^8c^3 - 3a^3b^7c^2d + 3a^4b^6 \\
& * c^2d^2 - a^5b^5d^3) * g^5 * x^2 + 4 * (a^3b^7c^3 - 3a^4b^6c^2d + 3a^5b^5 \\
& * c^2d^2 - a^6b^4d^3) * g^5 * x + (a^4b^6c^3 - 3a^5b^5c^2d + 3a^6b^4c \\
& * d^2 - a^7b^3d^3) * g^5) - 12 * (6b^2c^2d^2 - 4a^2b^2c^2d^2 + a^2d^4) * \log(b \\
& * x + a) / ((b^7c^4 - 4a^2b^6c^3d + 6a^2b^5c^2d^2 - 4a^3b^4c^2d^3 + a \\
& ^4b^3d^4) * g^5) + 12 * (6b^2c^2d^2 - 4a^2b^2c^2d^2 + a^2d^4) * \log(dx + c) / \\
& ((b^7c^4 - 4a^2b^6c^3d + 6a^2b^5c^2d^2 - 4a^3b^4c^2d^3 + a^4b^3d^4) * g^5) * \log(b * e * x / (dx + c) + a * e / (dx + c)) + (115a^2b^4c^4 - 1360a^ \\
& 3b^3c^3d + 1512a^4b^2c^2d^2 - 304a^5b^2c^2d^3 + 37a^6d^4 - 12 * (108 \\
& * b^6c^3d - 148a^2b^5c^2d^2 + 47a^2b^4c^2d^3 - 7a^3b^3d^4) * x^3 + 6 * \\
& (36b^6c^4 - 712a^2b^5c^3d + 903a^2b^4c^2d^2 - 264a^3b^3c^2d^3 + 3 \\
& 7a^4b^2d^4) * x^2 + 72 * (6a^4b^2c^2d^2 - 4a^5b^2c^2d^3 + a^6d^4 + (6b \\
& ^6c^2d^2 - 4a^2b^5c^2d^3 + a^2b^4d^4) * x^4 + 4 * (6a^2b^5c^2d^2 - 4a^2b \\
& ^4c^2d^3 + a^3b^3d^4) * x^3 + 6 * (6a^2b^4c^2d^2 - 4a^3b^3c^2d^3 + a^4 \\
& * b^2d^4) * x^2 + 4 * (6a^3b^3c^2d^2 - 4a^4b^2c^2d^3 + a^5b^2d^4) * x) * \log( \\
& b * x + a)^2 + 72 * (6a^4b^2c^2d^2 - 4a^5b^2c^2d^3 + a^6d^4 + (6b^6c^2d^2 \\
& ^2 - 4a^2b^5c^2d^3 + a^2b^4d^4) * x^4 + 4 * (6a^2b^5c^2d^2 - 4a^2b^4c^2d^ \\
& 3 + a^3b^3d^4) * x^3 + 6 * (6a^2b^4c^2d^2 - 4a^3b^3c^2d^3 + a^4b^2d^4) \\
& ) * x^2 + 4 * (6a^3b^3c^2d^2 - 4a^4b^2c^2d^3 + a^5b^2d^4) * x) * \log(dx + c) \\
& ^2 + 4 * (76a^2b^5c^4 - 1057a^2b^4c^3d + 1248a^3b^3c^2d^2 - 304a^4b^2 \\
& c^2d^3 + 37a^5b^2d^4) * x - 12 * (108a^4b^2c^2d^2 - 40a^5b^2c^2d^3 + 7a \\
& ^6d^4 + (108b^6c^2d^2 - 40a^2b^5c^2d^3 + 7a^2b^4d^4) * x^4 + 4 * (108a \\
& * b^5c^2d^2 - 40a^2b^4c^2d^3 + 7a^3b^3d^4) * x^3 + 6 * (108a^2b^4c^2d^2 \\
& ^2 - 40a^3b^3c^2d^3 + 7a^4b^2d^4) * x^2 + 4 * (108a^3b^3c^2d^2 - 40a^4 \\
& b^2c^2d^3 + 7a^5b^2d^4) * x) * \log(b * x + a) + 12 * (108a^4b^2c^2d^2 - 40a \\
& ^5b^2c^2d^3 + 7a^6d^4 + (108b^6c^2d^2 - 40a^2b^5c^2d^3 + 7a^2b^4d^4) \\
& ) * x^4 + 4 * (108a^2b^5c^2d^2 - 40a^2b^4c^2d^3 + 7a^3b^3d^4) * x^3 + 6 * (10 \\
& 8a^2b^4c^2d^2 - 40a^3b^3c^2d^3 + 7a^4b^2d^4) * x^2 + 4 * (108a^3b^3c^2 \\
& d^2 - 40a^4b^2c^2d^3 + 7a^5b^2d^4) * x - 12 * (6a^4b^2c^2d^2 - 4a^5 \\
& * b^2c^2d^3 + a^6d^4 + (6b^6c^2d^2 - 4a^2b^5c^2d^3 + a^2b^4d^4) * x^4 + 4 * \\
& (6a^2b^5c^2d^2 - 4a^2b^4c^2d^3 + a^3b^3d^4) * x^3 + 6 * (6a^2b^4c^2d^2 \\
& ^2 - 4a^3b^3c^2d^3 + a^4b^2d^4) * x^2 + 4 * (6a^3b^3c^2d^2 - 4a^4b^2c^2 \\
& * d^3 + a^5b^2d^4) * x) * \log(b * x + a) * \log(dx + c)) / (a^4b^7c^4g^5 - 4a^5b \\
& ^6c^3d^2g^5 + 6a^6b^5c^2d^2g^5 - 4a^7b^4c^2d^3g^5 + a^8b^3d^4g^5 \\
& + (b^{11}c^4g^5 - 4a^2b^{10}c^3d^2g^5 + 6a^2b^9c^2d^2g^5 - 4a^3b^8c^2 \\
& * d^3g^5 + a^4b^7d^4g^5) * x^4 + 4 * (a^2b^{10}c^4g^5 - 4a^2b^9c^3d^2g^5 \\
& + 6a^3b^8c^2d^2g^5 - 4a^4b^7c^2d^3g^5 + a^5b^6d^4g^5) * x^3 + 6 * (a \\
& ^2b^9c^4g^5 - 4a^3b^8c^3d^2g^5 + 6a^4b^7c^2d^2g^5 - 4a^5b^6c^2 \\
& * d^3g^5 + a^6b^5d^4g^5) * x^2 + 4 * (a^3b^8c^4g^5 - 4a^4b^7c^3d^2g^5 + \\
& 6a^5b^6c^2d^2g^5 - 4a^6b^5c^2d^3g^5 + a^7b^4d^4g^5) * x) * B^2d^2 \\
& * i^2 - 1/72 * A * B * d^2 * i^2 * (12 * (6b^2x^2 + 4a^2b^2x + a^2) * \log(b * e * x / (dx + c) \\
& + a * e / (dx + c))) / (b^7g^5x^4 + 4a^2b^6g^5x^3 + 6a^2b^5g^5x^2 + 4a^
\end{aligned}$$

$$\begin{aligned}
& 3*b^4*g^5*x + a^4*b^3*g^5) + (13*a^2*b^3*c^3 - 75*a^3*b^2*c^2*d + 33*a^4*b*c*d^2 - 7*a^5*d^3 - 12*(6*b^5*c^2*d - 4*a*b^4*c*d^2 + a^2*b^3*d^3)*x^3 + 6*(6*b^5*c^3 - 46*a*b^4*c^2*d + 29*a^2*b^3*c*d^2 - 7*a^3*b^2*d^3)*x^2 + 4*(10*a*b^4*c^3 - 63*a^2*b^3*c^2*d + 33*a^3*b^2*c*d^2 - 7*a^4*b*d^3)*x)/((b^10*c^3 - 3*a*b^9*c^2*d + 3*a^2*b^8*c*d^2 - a^3*b^7*d^3)*g^5*x^4 + 4*(a*b^9*c^3 - 3*a^2*b^8*c^2*d + 3*a^3*b^7*c*d^2 - a^4*b^6*d^3)*g^5*x^3 + 6*(a^2*b^8*c^3 - 3*a^3*b^7*c^2*d + 3*a^4*b^6*c*d^2 - a^5*b^5*d^3)*g^5*x^2 + 4*(a^3*b^7*c^3 - 3*a^4*b^6*c^2*d + 3*a^5*b^5*c*d^2 - a^6*b^4*d^3)*g^5*x + (a^4*b^6*c^3 - 3*a^5*b^5*c^2*d + 3*a^6*b^4*c*d^2 - a^7*b^3*d^3)*g^5) - 12*(6*b^2*c^2*d^2 - 4*a*b*c*d^3 + a^2*d^4)*log(b*x + a)/((b^7*c^4 - 4*a*b^6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4*a^3*b^4*c*d^3 + a^4*b^3*d^4)*g^5) + 12*(6*b^2*c^2*d^2 - 4*a*b*c*d^3 + a^2*d^4)*log(d*x + c)/((b^7*c^4 - 4*a*b^6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4*a^3*b^4*c*d^3 + a^4*b^3*d^4)*g^5)) - 1/36*A*B*c*d*i^2*(12*(4*b*x + a)*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^6*g^5*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g^5) + (7*a*b^3*c^3 - 33*a^2*b^2*c^2*d + 75*a^3*b*c*d^2 - 13*a^4*d^3 + 12*(4*b^4*c*d^2 - a*b^3*d^3)*x^3 - 6*(4*b^4*c^2*d - 29*a*b^3*c*d^2 + 7*a^2*b^2*d^3)*x^2 + 4*(4*b^4*c^3 - 21*a*b^3*c^2*d + 57*a^2*b^2*c*d^2 - 13*a^3*b*d^3)*x)/((b^9*c^3 - 3*a*b^8*c^2*d + 3*a^2*b^7*c*d^2 - a^3*b^6*d^3)*g^5*x^4 + 4*(a*b^8*c^3 - 3*a^2*b^7*c^2*d + 3*a^3*b^6*c*d^2 - a^4*b^5*d^3)*g^5*x^3 + 6*(a^2*b^7*c^3 - 3*a^3*b^6*c^2*d + 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)*g^5*x^2 + 4*(a^3*b^6*c^3 - 3*a^4*b^5*c^2*d + 3*a^5*b^4*c*d^2 - a^6*b^3*d^3)*g^5*x + (a^4*b^5*c^3 - 3*a^5*b^4*c^2*d + 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*g^5) + 12*(4*b*c*d^3 - a*d^4)*log(b*x + a)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*g^5) - 12*(4*b*c*d^3 - a*d^4)*log(d*x + c)/((b^6*c^4 - 4*a*b^5*c^3*d + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*g^5)) + 1/24*A*B*c^2*i^2*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 25*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2 + 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g^5) - 12*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5)) - 1/4*B^2*c^2*i^2*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) - 1/6*(4*b*x + a)*A^2*c*d*i^2/(b^6*g^5*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g^5) - 1/12*(6*b^2*x^2 + 4*a*b*x + a^2)*A^2*d^2*i^2/(b^7*g^5*x^4 + 4*a*b^6*g^5*x^3 + 6*a^2*b^5*g^5*x^2 + 4*a^3*b^4*g^5*x + a^4*b^3*g^5) - 1/4*A^2*c^2*i^2/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5)
\end{aligned}$$

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**Fricas [B]** time = 0.590224, size = 1733, normalized size = 5.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^5,x, algorithm="fricas")

[Out] 
$$\frac{1}{864} \cdot (12 \cdot ((12 \cdot A \cdot B + 7 \cdot B^2) \cdot b^4 \cdot c \cdot d^3 - (12 \cdot A \cdot B + 7 \cdot B^2) \cdot a \cdot b^3 \cdot d^4) \cdot i^2 \cdot x^3 - 6 \cdot ((72 \cdot A^2 + 12 \cdot A \cdot B - 5 \cdot B^2) \cdot b^4 \cdot c^2 \cdot d^2 - 16 \cdot (9 \cdot A^2 + 6 \cdot A \cdot B + 2 \cdot B^2) \cdot a \cdot b^3 \cdot c \cdot d^3 + (72 \cdot A^2 + 84 \cdot A \cdot B + 37 \cdot B^2) \cdot a^2 \cdot b^2 \cdot d^4) \cdot i^2 \cdot x^2 - 4 \cdot ((144 \cdot A^2 + 60 \cdot A \cdot B + 11 \cdot B^2) \cdot b^4 \cdot c^3 \cdot d - 24 \cdot (9 \cdot A^2 + 6 \cdot A \cdot B + 2 \cdot B^2) \cdot a \cdot b^3 \cdot c^2 \cdot d^2 + (72 \cdot A^2 + 84 \cdot A \cdot B + 37 \cdot B^2) \cdot a^3 \cdot b \cdot d^4) \cdot i^2 \cdot x - (27 \cdot (8 \cdot A^2 + 4 \cdot A \cdot B + B^2) \cdot b^4 \cdot c^4 - 32 \cdot (9 \cdot A^2 + 6 \cdot A \cdot B + 2 \cdot B^2) \cdot a \cdot b^3 \cdot c^3 \cdot d + (72 \cdot A^2 + 84 \cdot A \cdot B + 37 \cdot B^2) \cdot a^4 \cdot d^4) \cdot i^2 + 72 \cdot (B^2 \cdot b^4 \cdot d^4 \cdot i^2 \cdot x^4 + 4 \cdot B^2 \cdot a \cdot b^3 \cdot d^4 \cdot i^2 \cdot x^3 - 6 \cdot (B^2 \cdot b^4 \cdot c^2 \cdot d^2 - 2 \cdot B^2 \cdot a \cdot b^3 \cdot c \cdot d^3) \cdot i^2 \cdot x^2 - 4 \cdot (2 \cdot B^2 \cdot b^4 \cdot c^3 \cdot d - 3 \cdot B^2 \cdot a \cdot b^3 \cdot c^2 \cdot d^2) \cdot i^2 \cdot x - (3 \cdot B^2 \cdot b^4 \cdot c^4 - 4 \cdot B^2 \cdot a \cdot b^3 \cdot c^3 \cdot d) \cdot i^2) \cdot \log((b \cdot e \cdot x + a \cdot e) / (d \cdot x + c))^2 + 12 \cdot ((12 \cdot A \cdot B + 7 \cdot B^2) \cdot b^4 \cdot d^4 \cdot i^2 \cdot x^4 + 4 \cdot (3 \cdot B^2 \cdot b^4 \cdot c \cdot d^3 + 4 \cdot (3 \cdot A \cdot B + B^2) \cdot a \cdot b^3 \cdot d^4) \cdot i^2 \cdot x^3 - 6 \cdot ((12 \cdot A \cdot B + B^2) \cdot b^4 \cdot c^2 \cdot d^2 - 8 \cdot (3 \cdot A \cdot B + B^2) \cdot a \cdot b^3 \cdot c \cdot d^3) \cdot i^2 \cdot x^2 - 4 \cdot ((24 \cdot A \cdot B + 5 \cdot B^2) \cdot b^4 \cdot c^3 \cdot d - 12 \cdot (3 \cdot A \cdot B + B^2) \cdot a \cdot b^3 \cdot c^2 \cdot d^2) \cdot i^2 \cdot x - (9 \cdot (4 \cdot A \cdot B + B^2) \cdot b^4 \cdot c^4 - 16 \cdot (3 \cdot A \cdot B + B^2) \cdot a \cdot b^3 \cdot c^3 \cdot d) \cdot i^2) \cdot \log((b \cdot e \cdot x + a \cdot e) / (d \cdot x + c)) / ((b^9 \cdot c^2 - 2 \cdot a \cdot b^8 \cdot c \cdot d + a^2 \cdot b^7 \cdot d^2) \cdot g^5 \cdot x^4 + 4 \cdot (a \cdot b^8 \cdot c^2 - 2 \cdot a^2 \cdot b^7 \cdot c \cdot d + a^3 \cdot b^6 \cdot d^2) \cdot g^5 \cdot x^3 + 6 \cdot (a^2 \cdot b^7 \cdot c^2 - 2 \cdot a^3 \cdot b^6 \cdot c \cdot d + a^4 \cdot b^5 \cdot d^2) \cdot g^5 \cdot x^2 + 4 \cdot (a^3 \cdot b^6 \cdot c^2 - 2 \cdot a^4 \cdot b^5 \cdot c \cdot d + a^5 \cdot b^4 \cdot d^2) \cdot g^5 \cdot x + (a^4 \cdot b^5 \cdot c^2 - 2 \cdot a^5 \cdot b^4 \cdot c \cdot d + a^6 \cdot b^3 \cdot d^2) \cdot g^5)$$

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**Sympy [B]** time = 133.626, size = 2054, normalized size = 6.87

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*\*2\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))\*\*2/(b\*g\*x+a\*g)\*\*5,x)

[Out] 
$$-B \cdot d^{**4} \cdot i^{**2} \cdot (12 \cdot A + 7 \cdot B) \cdot \log(x + (12 \cdot A \cdot B \cdot a \cdot d^{**5} \cdot i^{**2} + 12 \cdot A \cdot B \cdot b \cdot c \cdot d^{**4} \cdot i^{**2} + 7 \cdot B^{**2} \cdot a \cdot d^{**5} \cdot i^{**2} + 7 \cdot B^{**2} \cdot b \cdot c \cdot d^{**4} \cdot i^{**2} - B \cdot a^{**3} \cdot d^{**7} \cdot i^{**2} \cdot (12 \cdot A + 7 \cdot B) / (a \cdot d - b \cdot c) \cdot i^{**2} + 3 \cdot B \cdot a^{**2} \cdot b \cdot c \cdot d^{**6} \cdot i^{**2} \cdot (12 \cdot A + 7 \cdot B) / (a \cdot d - b \cdot c) \cdot i^{**2} - 3 \cdot B \cdot a \cdot b^{**2} \cdot c \cdot d^{**5} \cdot i^{**2} \cdot (12 \cdot A + 7 \cdot B) / (a \cdot d - b \cdot c) \cdot i^{**2} + B \cdot b^{**3} \cdot c \cdot d^{**4} \cdot i^{**2}$$

$$\begin{aligned}
& * (12*A + 7*B) / (a*d - b*c)^2 / (24*A*B*b*d^5*i^2 + 14*B^2*b*d^5*i^2) / ( \\
& 72*b^3*g^5*(a*d - b*c)^2 + B*d^4*i^2*(12*A + 7*B)*\log(x + (12*A*B*a*d \\
& ^5*i^2 + 12*A*B*b*c*d^4*i^2 + 7*B^2*a*d^5*i^2 + 7*B^2*b*c*d^4*i^2 \\
& + B*a^3*d^7*i^2*(12*A + 7*B) / (a*d - b*c)^2 - 3*B*a^2*b*c*d^6*i^2*(1 \\
& 2*A + 7*B) / (a*d - b*c)^2 + 3*B*a*b^2*c^2*d^5*i^2*(12*A + 7*B) / (a*d - b \\
& *c)^2 - B*b^3*c^3*d^4*i^2*(12*A + 7*B) / (a*d - b*c)^2) / (24*A*B*b*d^5* \\
& i^2 + 14*B^2*b*d^5*i^2) / (72*b^3*g^5*(a*d - b*c)^2) + (4*B^2*a*c^3 \\
& *d*i^2 + 12*B^2*a*c^2*d^2*i^2*x + 12*B^2*a*c*d^3*i^2*x^2 + 4*B^2* \\
& a*d^4*i^2*x^3 - 3*B^2*b*c^4*i^2 - 8*B^2*b*c^3*d*i^2*x - 6*B^2*b*c \\
& ^2*d^2*i^2*x^2 + B^2*b*d^4*i^2*x^4)*\log(e*(a + b*x) / (c + d*x))^2 / ( \\
& 12*a^6*d^2*g^5 - 24*a^5*b*c*d*g^5 + 48*a^5*b*d^2*g^5*x + 12*a^4*b* \\
& ^2*c^2*g^5 - 96*a^4*b^2*c*d*g^5*x + 72*a^4*b^2*d^2*g^5*x^2 + 48*a \\
& ^3*b^3*c^2*g^5*x - 144*a^3*b^3*c*d*g^5*x^2 + 48*a^3*b^3*d^2*g^5 \\
& *x^3 + 72*a^2*b^4*c^2*g^5*x^2 - 96*a^2*b^4*c*d*g^5*x^3 + 12*a^2* \\
& b^4*d^2*g^5*x^4 + 48*a*b^5*c^2*g^5*x^3 - 24*a*b^5*c*d*g^5*x^4 + \\
& 12*b^6*c^2*g^5*x^4) + (-12*A*B*a^3*d^3*i^2 - 12*A*B*a^2*b*c*d^2*i \\
& ^2 - 48*A*B*a^2*b*d^3*i^2*x - 12*A*B*a*b^2*c^2*d*i^2 - 48*A*B*a*b^2* \\
& c*d^2*i^2*x - 72*A*B*a*b^2*d^3*i^2*x^2 + 36*A*B*b^3*c^3*i^2 + 96*A \\
& *B*b^3*c^2*d*i^2*x + 72*A*B*b^3*c*d^2*i^2*x^2 - 7*B^2*a^3*d^3*i^2 \\
& - 7*B^2*a^2*b*c*d^2*i^2 - 28*B^2*a^2*b*d^3*i^2*x - 7*B^2*a*b^2* \\
& c^2*d*i^2 - 28*B^2*a*b^2*c*d^2*i^2*x - 42*B^2*a*b^2*d^3*i^2*x^2 \\
& + 9*B^2*b^3*c^3*i^2 + 20*B^2*b^3*c^2*d*i^2*x + 6*B^2*b^3*c*d^2*i \\
& ^2*x^2 - 12*B^2*b^3*d^3*i^2*x^3)*\log(e*(a + b*x) / (c + d*x)) / (72*a^5 \\
& *b^3*d*g^5 - 72*a^4*b^4*c*g^5 + 288*a^4*b^4*d*g^5*x - 288*a^3*b^5 \\
& *c*g^5*x + 432*a^3*b^5*d*g^5*x^2 - 432*a^2*b^6*c*g^5*x^2 + 288*a^2 \\
& *b^6*d*g^5*x^3 - 288*a*b^7*c*g^5*x^3 + 72*a*b^7*d*g^5*x^4 - 72*b \\
& ^8*c*g^5*x^4) - (72*A^2*a^3*d^3*i^2 + 72*A^2*a^2*b*c*d^2*i^2 + 72 \\
& *A^2*a*b^2*c^2*d*i^2 - 216*A^2*b^3*c^3*i^2 + 84*A*B*a^3*d^3*i^2 \\
& + 84*A*B*a^2*b*c*d^2*i^2 + 84*A*B*a*b^2*c^2*d*i^2 - 108*A*B*b^3*c^3 \\
& *i^2 + 37*B^2*a^3*d^3*i^2 + 37*B^2*a^2*b*c*d^2*i^2 + 37*B^2*a*b^2 \\
& *c^2*d*i^2 - 27*B^2*b^3*c^3*i^2 + x^3*(144*A*B*b^3*d^3*i^2 + 84* \\
& B^2*b^3*d^3*i^2) + x^2*(432*A^2*a*b^2*d^3*i^2 - 432*A^2*b^3*c*d \\
& ^2*i^2 + 504*A*B*a*b^2*d^3*i^2 - 72*A*B*b^3*c*d^2*i^2 + 222*B^2*a*b \\
& ^2*d^3*i^2 + 30*B^2*b^3*c*d^2*i^2) + x*(288*A^2*a^2*b*d^3*i^2 + \\
& 288*A^2*a*b^2*c*d^2*i^2 - 576*A^2*b^3*c^2*d*i^2 + 336*A*B*a^2*b*d \\
& ^3*i^2 + 336*A*B*a*b^2*c*d^2*i^2 - 240*A*B*b^3*c^2*d*i^2 + 148*B^2* \\
& a^2*b*d^3*i^2 + 148*B^2*a*b^2*c*d^2*i^2 - 44*B^2*b^3*c^2*d*i^2) \\
& / (864*a^5*b^3*d*g^5 - 864*a^4*b^4*c*g^5 + x^4*(864*a*b^7*d*g^5 - 8 \\
& 64*b^8*c*g^5) + x^3*(3456*a^2*b^6*d*g^5 - 3456*a*b^7*c*g^5) + x^2* \\
& (5184*a^3*b^5*d*g^5 - 5184*a^2*b^6*c*g^5) + x*(3456*a^4*b^4*d*g^5 \\
& - 3456*a^3*b^5*c*g^5))
\end{aligned}$$

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2 \left( B \log \left( \frac{(bx+a)e}{dx+c} \right) + A \right)^2}{(bgx + ag)^5} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^5,x, algorithm="giac")

[Out] integrate((d\*i\*x + c\*i)^2\*(B\*log((b\*x + a)\*e/(d\*x + c)) + A)^2/(b\*g\*x + a\*g)^5, x)

$$3.73 \quad \int \frac{(ci+dx)^2 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)^2}{(ag+bgx)^6} dx$$

**Optimal.** Leaf size=463

$$\frac{b^2 i^2 (c+dx)^5 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)^2}{5g^6 (a+bx)^5 (bc-ad)^3} - \frac{2b^2 Bi^2 (c+dx)^5 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{25g^6 (a+bx)^5 (bc-ad)^3} - \frac{d^2 i^2 (c+dx)^3 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)^2}{3g^6 (a+bx)^3 (bc-ad)^3} - \dots$$

[Out]  $(-2*B^2*d^2*i^2*(c+dx)^3)/(27*(b*c-a*d)^3*g^6*(a+bx)^3) + (b*B^2*d*i^2*(c+dx)^4)/(16*(b*c-a*d)^3*g^6*(a+bx)^4) - (2*b^2*B^2*i^2*(c+dx)^5)/(125*(b*c-a*d)^3*g^6*(a+bx)^5) - (2*B*d^2*i^2*(c+dx)^3*(A+B*Log[(e*(a+bx))/(c+dx])))/(9*(b*c-a*d)^3*g^6*(a+bx)^3) + (b*B*d*i^2*(c+dx)^4*(A+B*Log[(e*(a+bx))/(c+dx])))/(4*(b*c-a*d)^3*g^6*(a+bx)^4) - (2*b^2*B*i^2*(c+dx)^5*(A+B*Log[(e*(a+bx))/(c+dx])))/(25*(b*c-a*d)^3*g^6*(a+bx)^5) - (d^2*i^2*(c+dx)^3*(A+B*Log[(e*(a+bx))/(c+dx]))^2)/(3*(b*c-a*d)^3*g^6*(a+bx)^3) + (b*d*i^2*(c+dx)^4*(A+B*Log[(e*(a+bx))/(c+dx]))^2)/(2*(b*c-a*d)^3*g^6*(a+bx)^4) - (b^2*i^2*(c+dx)^5*(A+B*Log[(e*(a+bx))/(c+dx]))^2)/(5*(b*c-a*d)^3*g^6*(a+bx)^5)$

**Rubi [C]** time = 4.21895, antiderivative size = 1009, normalized size of antiderivative = 2.18, number of steps used = 116, number of rules used = 11, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.262$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2 i^2 \log^2(a+bx) d^5}{30b^3 (bc-ad)^3 g^6} + \frac{B^2 i^2 \log^2(c+dx) d^5}{30b^3 (bc-ad)^3 g^6} - \frac{47B^2 i^2 \log(a+bx) d^5}{900b^3 (bc-ad)^3 g^6} - \frac{Bi^2 \log(a+bx) \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right) d^5}{15b^3 (bc-ad)^3 g^6} + \frac{47B^2 i^2 d^5}{900b^3 (bc-ad)^3 g^6}$$

Antiderivative was successfully verified.

[In] Int[((c\*i + d\*i\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))^2)/(a\*g + b\*g\*x)^6,x]

[Out]  $(-2*B^2*(b*c-a*d)^2*i^2)/(125*b^3*g^6*(a+bx)^5) - (7*B^2*d*(b*c-a*d)*i^2)/(400*b^3*g^6*(a+bx)^4) + (43*B^2*d^2*i^2)/(2700*b^3*g^6*(a+bx)^3) - (13*B^2*d^3*i^2)/(1800*b^3*(b*c-a*d)*g^6*(a+bx)^2) - (47*B^2*d^4*i^2)/(900*b^3*(b*c-a*d)^2*g^6*(a+bx)) - (47*B^2*d^5*i^2*Log[a+bx])/(900*b^3*(b*c-a*d)^3*g^6) + (B^2*d^5*i^2*Log[a+bx]^2)/(30*b^3*(b*c-a*d)^3*g^6) - (2*B*(b*c-a*d)^2*i^2*(A+B*Log[(e*(a+bx))/(c+dx])))/(25*b^3*g^6*(a+bx)^5) - (3*B*d*(b*c-a*d)*i^2*(A+B*Log[(e*(a+bx))/(c+dx])))/(25*b^3*g^6*(a+bx)^5)$

$$\frac{c + dx)}{20b^3g^6(a + bx)^4 - (Bd^2i^2(A + B\log[(e(a + bx))/(c + dx)])) / (45b^3g^6(a + bx)^3 + (Bd^3i^2(A + B\log[(e(a + bx))/(c + dx)])) / (30b^3(b^3c - a^3d)g^6(a + bx)^2) - (Bd^4i^2(A + B\log[(e(a + bx))/(c + dx)])) / (15b^3(b^3c - a^3d)^2g^6(a + bx)) - (Bd^5i^2 \log[a + bx] * (A + B\log[(e(a + bx))/(c + dx)])) / (15b^3(b^3c - a^3d)^3g^6) - ((b^3c - a^3d)^2i^2(A + B\log[(e(a + bx))/(c + dx)]))^2 / (5b^3g^6(a + bx)^5) - (d(b^3c - a^3d)i^2(A + B\log[(e(a + bx))/(c + dx)]))^2 / (2b^3g^6(a + bx)^4) - (d^2i^2(A + B\log[(e(a + bx))/(c + dx)]))^2 / (3b^3g^6(a + bx)^3) + (47B^2d^5i^2 \log[c + dx]) / (900b^3(b^3c - a^3d)^3g^6) - (B^2d^5i^2 \log[-((d(a + bx))/(b^3c - a^3d))] * \log[c + dx]) / (15b^3(b^3c - a^3d)^3g^6) + (Bd^5i^2(A + B\log[(e(a + bx))/(c + dx)]) * \log[c + dx]) / (15b^3(b^3c - a^3d)^3g^6) + (B^2d^5i^2 \log[c + dx]^2) / (30b^3(b^3c - a^3d)^3g^6) - (B^2d^5i^2 \log[a + bx] * \log[(b(c + dx))/(b^3c - a^3d)]) / (15b^3(b^3c - a^3d)^3g^6) - (B^2d^5i^2 \text{PolyLog}[2, -((d(a + bx))/(b^3c - a^3d))]) / (15b^3(b^3c - a^3d)^3g^6) - (B^2d^5i^2 \text{PolyLog}[2, (b(c + dx))/(b^3c - a^3d)]) / (15b^3(b^3c - a^3d)^3g^6)$$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```



Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}
\int \frac{(73c + 73dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(ag + bgx)^6} dx &= \int \left( \frac{5329(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2 g^6 (a + bx)^6} + \frac{10658d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2 g^6 (a + bx)^5} \right) dx \\
&= \frac{(5329d^2) \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(a+bx)^4} dx}{b^2 g^6} + \frac{(10658d(bc - ad)) \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(a+bx)^5} dx}{b^2 g^6} \\
&= -\frac{5329(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{5b^3 g^6 (a + bx)^5} - \frac{5329d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{2b^3 g^6 (a + bx)^4} \\
&= -\frac{5329(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{5b^3 g^6 (a + bx)^5} - \frac{5329d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{2b^3 g^6 (a + bx)^4} \\
&= -\frac{5329(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{5b^3 g^6 (a + bx)^5} - \frac{5329d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{2b^3 g^6 (a + bx)^4} \\
&= -\frac{5329(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{5b^3 g^6 (a + bx)^5} - \frac{5329d(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{2b^3 g^6 (a + bx)^4} \\
&= -\frac{10658B(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{25b^3 g^6 (a + bx)^5} - \frac{15987Bd(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{20b^3 g^6 (a + bx)^4} \\
&= -\frac{10658B(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{25b^3 g^6 (a + bx)^5} - \frac{15987Bd(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{20b^3 g^6 (a + bx)^4} \\
&= -\frac{10658B(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{25b^3 g^6 (a + bx)^5} - \frac{15987Bd(bc - ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{20b^3 g^6 (a + bx)^4} \\
&= -\frac{10658B^2(bc - ad)^2}{125b^3 g^6 (a + bx)^5} - \frac{37303B^2d(bc - ad)}{400b^3 g^6 (a + bx)^4} + \frac{229147B^2d^2}{2700b^3 g^6 (a + bx)^3} - \frac{1800B^2d^2}{1800b^3 g^6 (a + bx)^2} \\
&= -\frac{10658B^2(bc - ad)^2}{125b^3 g^6 (a + bx)^5} - \frac{37303B^2d(bc - ad)}{400b^3 g^6 (a + bx)^4} + \frac{229147B^2d^2}{2700b^3 g^6 (a + bx)^3} - \frac{1800B^2d^2}{1800b^3 g^6 (a + bx)^2} \\
&= -\frac{10658B^2(bc - ad)^2}{125b^3 g^6 (a + bx)^5} - \frac{37303B^2d(bc - ad)}{400b^3 g^6 (a + bx)^4} + \frac{229147B^2d^2}{2700b^3 g^6 (a + bx)^3} - \frac{1800B^2d^2}{1800b^3 g^6 (a + bx)^2} \\
&= -\frac{10658B^2(bc - ad)^2}{125b^3 g^6 (a + bx)^5} - \frac{37303B^2d(bc - ad)}{400b^3 g^6 (a + bx)^4} + \frac{229147B^2d^2}{2700b^3 g^6 (a + bx)^3} - \frac{1800B^2d^2}{1800b^3 g^6 (a + bx)^2}
\end{aligned}$$

**Mathematica [C]** time = 4.23366, size = 2220, normalized size = 4.79

Result too large to show

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2)/(a\*g + b\*g\*x)^6,x]

[Out] 
$$-(i^2*(10800*(b*c - a*d)^5*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])^2 + 27000*d*(b*c - a*d)^4*(a + b*x)*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])^2 - 18000*d^2*(-(b*c) + a*d)^3*(a + b*x)^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])^2 + 1000*B*d^2*(a + b*x)^2*(12*(b*c - a*d)^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]) - 18*d*(b*c - a*d)^2*(a + b*x)*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]) + 36*d^2*(b*c - a*d)*(a + b*x)^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]) + 36*d^3*(a + b*x)^3*\text{Log}[a + b*x]*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]) - 36*d^3*(a + b*x)^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])*\text{Log}[c + d*x] + 36*B*d^2*(a + b*x)^2*(b*c - a*d + d*(a + b*x))*\text{Log}[a + b*x] - d*(a + b*x)*\text{Log}[c + d*x] - 9*B*d*(a + b*x)*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*\text{Log}[a + b*x] + 2*d^2*(a + b*x)^2*\text{Log}[c + d*x]) + 2*B*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*\text{Log}[a + b*x] - 6*d^3*(a + b*x)^3*\text{Log}[c + d*x]) - 18*B*d^3*(a + b*x)^3*(\text{Log}[a + b*x]*(\text{Log}[a + b*x] - 2*\text{Log}[(b*(c + d*x))/(b*c - a*d)]) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 18*B*d^3*(a + b*x)^3*((2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] - \text{Log}[c + d*x])*\text{Log}[c + d*x] + 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]) + 375*B*d*(a + b*x)*(36*(b*c - a*d)^4*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]) + 48*d*(-(b*c) + a*d)^3*(a + b*x)*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]) + 72*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]) + 144*d^3*(-(b*c) + a*d)*(a + b*x)^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]) - 144*d^4*(a + b*x)^4*\text{Log}[a + b*x]*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]) + 144*d^4*(a + b*x)^4*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])*\text{Log}[c + d*x] - 144*B*d^3*(a + b*x)^3*(b*c - a*d + d*(a + b*x))*\text{Log}[a + b*x] - d*(a + b*x)*\text{Log}[c + d*x] + 36*B*d^2*(a + b*x)^2*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*\text{Log}[a + b*x] + 2*d^2*(a + b*x)^2*\text{Log}[c + d*x]) - 8*B*d*(a + b*x)*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*\text{Log}[a + b*x] - 6*d^3*(a + b*x)^3*\text{Log}[c + d*x]) + 3*B*(3*(b*c - a*d)^4 + 4*d*(-(b*c) + a*d)^3*(a + b*x) + 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 12*d^3*(-(b*c) + a*d)*(a + b*x)^3 - 12*d^4*(a + b*x)^4*\text{Log}[a + b*x] + 12*d^4*(a + b*x)^4*\text{Log}[c + d*x]) + 72*B*d^4*(a + b*x)^4*(\text{Log}[a + b*x]*(\text{Log}[a + b*x] - 2*\text{Log}[(b*(c + d*x))/(b*c - a*d)]) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 72*B*d^4*(a + b*x)^4*((2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] - \text{Log}[c + d*x])*\text{Log}[c + d*x] + 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]) + 6*B*(-225*a*B*d*(b*c - a*d)^4 + 144*B*(b*c - a*d)^5 - 225*b*B*d*(b*c - a*d)^4*x + 300*a*B*d^2*(b*c - a*d)^3*(a + b*x)$$

$$\begin{aligned}
& - 180*B*d*(b*c - a*d)^4*(a + b*x) + 300*b*B*d^2*(b*c - a*d)^3*x*(a + b*x) \\
& - 450*a*B*d^3*(b*c - a*d)^2*(a + b*x)^2 + 640*B*d^2*(b*c - a*d)^3*(a + b*x) \\
& ^2 - 450*b*B*d^3*(b*c - a*d)^2*x*(a + b*x)^2 + 900*a*B*d^4*(b*c - a*d)*(a + \\
& b*x)^3 - 1860*B*d^3*(b*c - a*d)^2*(a + b*x)^3 + 900*b*B*d^4*(b*c - a*d)*x* \\
& (a + b*x)^3 + 3600*b*B*c*d^4*(a + b*x)^4 - 3600*a*B*d^5*(a + b*x)^4 + 3720* \\
& B*d^4*(b*c - a*d)*(a + b*x)^4 + 900*a*B*d^5*(a + b*x)^4*\text{Log}[a + b*x] + 900* \\
& b*B*d^5*x*(a + b*x)^4*\text{Log}[a + b*x] + 7320*B*d^5*(a + b*x)^5*\text{Log}[a + b*x] + \\
& 720*(b*c - a*d)^5*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]) - 900*d*(b*c - a*d)^4* \\
& (a + b*x)*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]) + 1200*d^2*(b*c - a*d)^3*( \\
& a + b*x)^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]) - 1800*d^3*(b*c - a*d)^2*(a \\
& + b*x)^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]) + 3600*d^4*(b*c - a*d)*(a + \\
& b*x)^4*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]) + 3600*d^5*(a + b*x)^5*\text{Log}[a + \\
& b*x]*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]) - 900*a*B*d^5*(a + b*x)^4*\text{Log}[c + \\
& d*x] - 900*b*B*d^5*x*(a + b*x)^4*\text{Log}[c + d*x] - 7320*B*d^5*(a + b*x)^5*\text{Log} \\
& [c + d*x] - 3600*d^5*(a + b*x)^5*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])*\text{Log}[c \\
& + d*x] - 1800*B*d^5*(a + b*x)^5*(\text{Log}[a + b*x]*(\text{Log}[a + b*x] - 2*\text{Log}[(b*(c \\
& + d*x))/(b*c - a*d)]) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 1800* \\
& B*d^5*(a + b*x)^5*((2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] - \text{Log}[c + d*x])* \\
& \text{Log}[c + d*x] + 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])))/(54000*b^3*(b*c - a \\
& *d)^3*g^6*(a + b*x)^5)
\end{aligned}$$


---

**Maple [B]** time = 0.056, size = 2761, normalized size = 6.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In]  $\text{int}((d*i*x+c*i)^2*(A+B*\ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^6,x)$

[Out] 
$$\begin{aligned}
& -1/3*e^3*d^2*i^2/(a*d-b*c)^4/g^6*A^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3* \\
& b*c-1/2*e^4*d^2*i^2/(a*d-b*c)^4/g^6*A^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b* \\
& c)^4*a+2/25*e^5*d*i^2/(a*d-b*c)^4/g^6*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c) \\
& )*b*c)^5*a+1/5*e^5*d*i^2/(a*d-b*c)^4/g^6*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d* \\
& x+c)*b*c)^5*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+1/4*e^4*d*i^2/(a*d-b*c)^4/g \\
& ^6*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*\ln(b*e/d+(a*d-b*c)*e/d/(d* \\
& x+c))*c+2/25*e^5*d*i^2/(a*d-b*c)^4/g^6*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+ \\
& c)*b*c)^5*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-1/3*e^3*d^2*i^2/(a*d-b*c)^4/g^6 \\
& *B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^ \\
& 2*b*c-2/9*e^3*d^2*i^2/(a*d-b*c)^4/g^6*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b* \\
& c)^3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c-1/2*e^4*d^2*i^2/(a*d-b*c)^4/g^6*B^ \\
& 2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2 \\
& *a+1/2*e^4*d*i^2/(a*d-b*c)^4/g^6*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c
\end{aligned}$$

$$\begin{aligned}
&)^4 \ln(b^*e/d+(a*d-b*c)*e/d/(d*x+c))^2 * c - 1/4 * e^4 * d^2 * i^2 / (a*d-b*c)^4 / g^6 * B^2 \\
&* b / (b^*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4 * \ln(b^*e/d+(a*d-b*c)*e/d/(d*x+c)) * a - \\
&2/5 * e^5 * i^2 / (a*d-b*c)^4 / g^6 * A * B * b^3 / (b^*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5 * \ln \\
&(b^*e/d+(a*d-b*c)*e/d/(d*x+c)) * c + 2/3 * e^3 * d^3 * i^2 / (a*d-b*c)^4 / g^6 * A * B / (b^*e/d \\
&+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3 * \ln(b^*e/d+(a*d-b*c)*e/d/(d*x+c)) * a - 2/9 * e^3 * d \\
&^2 * i^2 / (a*d-b*c)^4 / g^6 * A * B / (b^*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3 * b * c - 1/4 * e^4 \\
&* d^2 * i^2 / (a*d-b*c)^4 / g^6 * A * B * b / (b^*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4 * a + 1/4 \\
&* e^4 * d * i^2 / (a*d-b*c)^4 / g^6 * A * B * b^2 / (b^*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4 * c + \\
&1/2 * e^4 * d * i^2 / (a*d-b*c)^4 / g^6 * A^2 * b^2 / (b^*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4 \\
&* c + 1/5 * e^5 * d * i^2 / (a*d-b*c)^4 / g^6 * A^2 * b^2 / (b^*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c \\
&)^5 * a + 1/3 * e^3 * d^3 * i^2 / (a*d-b*c)^4 / g^6 * B^2 / (b^*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b * \\
&c)^3 * \ln(b^*e/d+(a*d-b*c)*e/d/(d*x+c))^2 * a - 2/25 * e^5 * i^2 / (a*d-b*c)^4 / g^6 * A * B * b \\
&^3 / (b^*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5 * c - 2/27 * e^3 * d^2 * i^2 / (a*d-b*c)^4 / g^6 \\
&* B^2 / (b^*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3 * b * c - 1/16 * e^4 * d^2 * i^2 / (a*d-b*c)^4 \\
&/ g^6 * B^2 * b / (b^*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4 * a + 1/16 * e^4 * d * i^2 / (a*d-b*c) \\
&^4 / g^6 * B^2 * b^2 / (b^*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4 * c + 2/125 * e^5 * d * i^2 / (a*d \\
&-b*c)^4 / g^6 * B^2 * b^2 / (b^*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5 * a + 2/5 * e^5 * d * i^2 / ( \\
&a*d-b*c)^4 / g^6 * A * B * b^2 / (b^*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5 * \ln(b^*e/d+(a*d- \\
&b*c)*e/d/(d*x+c)) * a - 2/3 * e^3 * d^2 * i^2 / (a*d-b*c)^4 / g^6 * A * B / (b^*e/d+e/(d*x+c)*a- \\
&e/d/(d*x+c)*b*c)^3 * \ln(b^*e/d+(a*d-b*c)*e/d/(d*x+c)) * b * c + e^4 * d * i^2 / (a*d-b*c)^4 \\
&/ g^6 * A * B * b^2 / (b^*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4 * \ln(b^*e/d+(a*d-b*c)*e/d/ \\
&(d*x+c)) * c - e^4 * d^2 * i^2 / (a*d-b*c)^4 / g^6 * A * B * b / (b^*e/d+e/(d*x+c)*a-e/d/(d*x+c) \\
&*b*c)^4 * \ln(b^*e/d+(a*d-b*c)*e/d/(d*x+c)) * a + 1/3 * e^3 * d^3 * i^2 / (a*d-b*c)^4 / g^6 * A \\
&^2 / (b^*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3 * a + 2/27 * e^3 * d^3 * i^2 / (a*d-b*c)^4 / g^6 \\
&* B^2 / (b^*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3 * a - 2/125 * e^5 * i^2 / (a*d-b*c)^4 / g^6 * \\
&B^2 * b^3 / (b^*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5 * c - 1/5 * e^5 * i^2 / (a*d-b*c)^4 / g^6 \\
&* A^2 * b^3 / (b^*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5 * c + 2/9 * e^3 * d^3 * i^2 / (a*d-b*c)^4 / g^6 \\
&* A * B / (b^*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3 * a - 1/5 * e^5 * i^2 / (a*d-b*c)^4 / g^6 \\
&^6 * B^2 * b^3 / (b^*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5 * \ln(b^*e/d+(a*d-b*c)*e/d/(d* \\
&x+c))^2 * c - 2/25 * e^5 * i^2 / (a*d-b*c)^4 / g^6 * B^2 * b^3 / (b^*e/d+e/(d*x+c)*a-e/d/(d*x+ \\
&c)*b*c)^5 * \ln(b^*e/d+(a*d-b*c)*e/d/(d*x+c)) * c + 2/9 * e^3 * d^3 * i^2 / (a*d-b*c)^4 / g^6 \\
&* B^2 / (b^*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3 * \ln(b^*e/d+(a*d-b*c)*e/d/(d*x+c)) * \\
&a
\end{aligned}$$


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**Maxima [B]** time = 7.22908, size = 14688, normalized size = 31.72

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^6,x, algorithm="maxima")

```

[Out] -1/10*(5*b*x + a)*B^2*c*d*i^2*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^7*g
^6*x^5 + 5*a*b^6*g^6*x^4 + 10*a^2*b^5*g^6*x^3 + 10*a^3*b^4*g^6*x^2 + 5*a^4*
b^3*g^6*x + a^5*b^2*g^6) - 1/30*(10*b^2*x^2 + 5*a*b*x + a^2)*B^2*d^2*i^2*lo
g(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^8*g^6*x^5 + 5*a*b^7*g^6*x^4 + 10*a^
2*b^6*g^6*x^3 + 10*a^3*b^5*g^6*x^2 + 5*a^4*b^4*g^6*x + a^5*b^3*g^6) - 1/900
0*(60*((60*b^4*d^4*x^4 + 12*b^4*c^4 - 63*a*b^3*c^3*d + 137*a^2*b^2*c^2*d^2
- 163*a^3*b*c*d^3 + 137*a^4*d^4 - 30*(b^4*c*d^3 - 9*a*b^3*d^4)*x^3 + 10*(2*
b^4*c^2*d^2 - 13*a*b^3*c*d^3 + 47*a^2*b^2*d^4)*x^2 - 5*(3*b^4*c^3*d - 17*a*
b^3*c^2*d^2 + 43*a^2*b^2*c*d^3 - 77*a^3*b*d^4)*x)/((b^10*c^4 - 4*a*b^9*c^3*
d + 6*a^2*b^8*c^2*d^2 - 4*a^3*b^7*c*d^3 + a^4*b^6*d^4)*g^6*x^5 + 5*(a*b^9*c
^4 - 4*a^2*b^8*c^3*d + 6*a^3*b^7*c^2*d^2 - 4*a^4*b^6*c*d^3 + a^5*b^5*d^4)*g
^6*x^4 + 10*(a^2*b^8*c^4 - 4*a^3*b^7*c^3*d + 6*a^4*b^6*c^2*d^2 - 4*a^5*b^5*
c*d^3 + a^6*b^4*d^4)*g^6*x^3 + 10*(a^3*b^7*c^4 - 4*a^4*b^6*c^3*d + 6*a^5*b^
5*c^2*d^2 - 4*a^6*b^4*c*d^3 + a^7*b^3*d^4)*g^6*x^2 + 5*(a^4*b^6*c^4 - 4*a^5
*b^5*c^3*d + 6*a^6*b^4*c^2*d^2 - 4*a^7*b^3*c*d^3 + a^8*b^2*d^4)*g^6*x + (a^
5*b^5*c^4 - 4*a^6*b^4*c^3*d + 6*a^7*b^3*c^2*d^2 - 4*a^8*b^2*c*d^3 + a^9*b*d
^4)*g^6) + 60*d^5*log(b*x + a)/((b^6*c^5 - 5*a*b^5*c^4*d + 10*a^2*b^4*c^3*d
^2 - 10*a^3*b^3*c^2*d^3 + 5*a^4*b^2*c*d^4 - a^5*b*d^5)*g^6) - 60*d^5*log(d*x
+ c)/((b^6*c^5 - 5*a*b^5*c^4*d + 10*a^2*b^4*c^3*d^2 - 10*a^3*b^3*c^2*d^3
+ 5*a^4*b^2*c*d^4 - a^5*b*d^5)*g^6))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) +
(144*b^5*c^5 - 1125*a*b^4*c^4*d + 4000*a^2*b^3*c^3*d^2 - 9000*a^3*b^2*c^2*
d^3 + 18000*a^4*b*c*d^4 - 12019*a^5*d^5 + 8220*(b^5*c*d^4 - a*b^4*d^5)*x^4
- 30*(77*b^5*c^2*d^3 - 1250*a*b^4*c*d^4 + 1173*a^2*b^3*d^5)*x^3 + 10*(94*b^
5*c^3*d^2 - 975*a*b^4*c^2*d^3 + 6600*a^2*b^3*c*d^4 - 5719*a^3*b^2*d^5)*x^2
- 1800*(b^5*d^5*x^5 + 5*a*b^4*d^5*x^4 + 10*a^2*b^3*d^5*x^3 + 10*a^3*b^2*d^5
*x^2 + 5*a^4*b*d^5*x + a^5*d^5)*log(b*x + a)^2 - 1800*(b^5*d^5*x^5 + 5*a*b^
4*d^5*x^4 + 10*a^2*b^3*d^5*x^3 + 10*a^3*b^2*d^5*x^2 + 5*a^4*b*d^5*x + a^5*d
^5)*log(d*x + c)^2 - 5*(81*b^5*c^4*d - 700*a*b^4*c^3*d^2 + 3000*a^2*b^3*c^2
*d^3 - 10800*a^3*b^2*c*d^4 + 8419*a^4*b*d^5)*x + 8220*(b^5*d^5*x^5 + 5*a*b^
4*d^5*x^4 + 10*a^2*b^3*d^5*x^3 + 10*a^3*b^2*d^5*x^2 + 5*a^4*b*d^5*x + a^5*d
^5)*log(b*x + a) - 60*(137*b^5*d^5*x^5 + 685*a*b^4*d^5*x^4 + 1370*a^2*b^3*d
^5*x^3 + 1370*a^3*b^2*d^5*x^2 + 685*a^4*b*d^5*x + 137*a^5*d^5 - 60*(b^5*d^5
*x^5 + 5*a*b^4*d^5*x^4 + 10*a^2*b^3*d^5*x^3 + 10*a^3*b^2*d^5*x^2 + 5*a^4*b*
d^5*x + a^5*d^5)*log(b*x + a))*log(d*x + c))/(a^5*b^6*c^5*g^6 - 5*a^6*b^5*c
^4*d*g^6 + 10*a^7*b^4*c^3*d^2*g^6 - 10*a^8*b^3*c^2*d^3*g^6 + 5*a^9*b^2*c*d^
4*g^6 - a^10*b*d^5*g^6 + (b^11*c^5*g^6 - 5*a*b^10*c^4*d*g^6 + 10*a^2*b^9*c^
3*d^2*g^6 - 10*a^3*b^8*c^2*d^3*g^6 + 5*a^4*b^7*c*d^4*g^6 - a^5*b^6*d^5*g^6)
*x^5 + 5*(a*b^10*c^5*g^6 - 5*a^2*b^9*c^4*d*g^6 + 10*a^3*b^8*c^3*d^2*g^6 - 1
0*a^4*b^7*c^2*d^3*g^6 + 5*a^5*b^6*c*d^4*g^6 - a^6*b^5*d^5*g^6)*x^4 + 10*(a^
2*b^9*c^5*g^6 - 5*a^3*b^8*c^4*d*g^6 + 10*a^4*b^7*c^3*d^2*g^6 - 10*a^5*b^6*c
^2*d^3*g^6 + 5*a^6*b^5*c*d^4*g^6 - a^7*b^4*d^5*g^6)*x^3 + 10*(a^3*b^8*c^5*g
^6 - 5*a^4*b^7*c^4*d*g^6 + 10*a^5*b^6*c^3*d^2*g^6 - 10*a^6*b^5*c^2*d^3*g^6
+ 5*a^7*b^4*c*d^4*g^6 - a^8*b^3*d^5*g^6)*x^2 + 5*(a^4*b^7*c^5*g^6 - 5*a^5*b
^6*c^4*d*g^6 + 10*a^6*b^5*c^3*d^2*g^6 - 10*a^7*b^4*c^2*d^3*g^6 + 5*a^8*b^3*
c*d^4*g^6 - a^9*b^2*d^5*g^6)*x))*B^2*c^2*i^2 - 1/18000*(60*((27*a*b^4*c^4 -

```

$$\begin{aligned}
& 148a^2b^3c^3d + 352a^3b^2c^2d^2 - 548a^4b^2cd^3 + 77a^5d^4 - 60(5b^5c^3d^3 - ab^4d^4)x^4 + 30(5b^5c^2d^2 - 46ab^4c^3d^3 + 9a^2b^3d^4)x^3 - 10(10b^5c^3d - 67ab^4c^2d^2 + 248a^2b^3c^3d^3 - 47a^3b^2d^4)x^2 + 5(15b^5c^4 - 88ab^4c^3d + 232a^2b^3c^2d^2 - 428a^3b^2cd^3 + 77a^4b^2d^4)x / ((b^{11}c^4 - 4a^2b^{10}c^3d + 6a^2b^9c^2d^2 - 4a^3b^8c^3d + a^4b^7d^4)g^6x^5 + 5(a^2b^{10}c^4 - 4a^2b^9c^3d + 6a^3b^8c^2d^2 - 4a^4b^7c^3d + a^5b^6d^4)g^6x^4 + 10(a^2b^9c^4 - 4a^3b^8c^3d + 6a^4b^7c^2d^2 - 4a^5b^6c^3d + a^6b^5d^4)g^6x^3 + 10(a^3b^8c^4 - 4a^4b^7c^3d + 6a^5b^6c^2d^2 - 4a^6b^5cd^3 + a^7b^4d^4)g^6x^2 + 5(a^4b^7c^4 - 4a^5b^6c^3d + 6a^6b^5c^2d^2 - 4a^7b^4cd^3 + a^8b^3d^4)g^6x + (a^5b^6c^4 - 4a^6b^5c^3d + 6a^7b^4c^2d^2 - 4a^8b^3cd^3 + a^9b^2d^4)g^6) - 60(5b^5c^3d^3 - ad^5) \log(bx + a) / ((b^7c^5 - 5a^2b^6c^4d + 10a^2b^5c^3d^2 - 10a^3b^4c^2d^3 + 5a^4b^3cd^4 - a^5b^2d^5)g^6) + 60(5b^5c^3d^3 - ad^5) \log(dx + c) / ((b^7c^5 - 5a^2b^6c^4d + 10a^2b^5c^3d^2 - 10a^3b^4c^2d^3 + 5a^4b^3cd^4 - a^5b^2d^5)g^6) * \log(bex / (dx + c) + ae / (dx + c)) + (549a^5b^5c^5 - 4625a^2b^4c^4d + 19000a^3b^3c^3d^2 - 63000a^4b^2c^2d^3 + 51875a^5b^2cd^4 - 3799a^6d^5 - 60(625b^6c^2d^3 - 702ab^5c^3d^4 + 77a^2b^4d^5)x^4 + 30(325b^6c^3d^2 - 5667ab^5c^2d^3 + 5975a^2b^4cd^4 - 633a^3b^3d^5)x^3 - 10(350b^6c^4d - 3949ab^5c^3d^2 + 29475a^2b^4c^2d^3 - 28775a^3b^3cd^4 + 2899a^4b^2d^5)x^2 + 1800(5a^5b^2cd^4 - a^6d^5 + (5b^6c^4d - ab^5d^5)x^5 + 5(5a^2b^4d^5)x^4 + 10(5a^2b^4cd^4 - a^3b^3d^5)x^3 + 10(5a^3b^3cd^4 - a^4b^2d^5)x^2 + 5(5a^4b^2cd^4 - a^5bd^5)x) * \log(bx + a)^2 + 1800(5a^5b^2cd^4 - a^6d^5 + (5b^6c^4d - ab^5d^5)x^5 + 5(5a^2b^4d^5)x^4 + 10(5a^2b^4cd^4 - a^3b^3d^5)x^3 + 10(5a^3b^3cd^4 - a^4b^2d^5)x^2 + 5(5a^4b^2cd^4 - a^5bd^5)x) * \log(dx + c)^2 + 5(225b^6c^5 - 2201a^2b^5c^4d + 10900a^2b^4c^3d^2 - 46200a^3b^3c^2d^3 + 41075a^4b^2cd^4 - 3799a^5bd^5)x - 60(625a^5b^2cd^4 - 77a^6d^5 + (625b^6c^4d - 77ab^5d^5)x^5 + 5(625a^2b^4d^5)x^4 + 10(625a^2b^4cd^4 - 77a^3b^3d^5)x^3 + 10(625a^3b^3cd^4 - 77a^4b^2d^5)x^2 + 5(625a^4b^2cd^4 - 77a^5bd^5)x) * \log(bx + a) + 60(625a^5b^2cd^4 - 77a^6d^5 + (625b^6c^4d - 77ab^5d^5)x^5 + 5(625a^2b^4d^5)x^4 + 10(625a^2b^4cd^4 - 77a^3b^3d^5)x^3 + 10(625a^3b^3cd^4 - 77a^4b^2d^5)x^2 + 5(625a^4b^2cd^4 - 77a^5bd^5)x - 60(5a^5b^2cd^4 - a^6d^5 + (5b^6c^4d - ab^5d^5)x^5 + 5(5a^2b^4d^5)x^4 + 10(5a^2b^4cd^4 - a^3b^3d^5)x^3 + 10(5a^3b^3cd^4 - a^4b^2d^5)x^2 + 5(5a^4b^2cd^4 - a^5bd^5)x) * \log(bx + a) * \log(dx + c) / (a^5b^7c^5g^6 - 5a^6b^6c^4d^5g^6 + 10a^7b^5c^3d^2g^6 - 10a^8b^4c^2d^3g^6 + 5a^9b^3cd^4g^6 - a^10b^2d^5g^6 + (b^{12}c^5g^6 - 5a^2b^{11}c^4d^5g^6 + 10a^2b^{10}c^3d^2g^6 - 10a^3b^9c^2d^3g^6 + 5a^4b^8cd^4g^6 - a^5b^7d^5g^6)x^5 + 5(a^2b^{11}c^5g^6 - 5a^2b^{10}c^4d^5g^6 + 10a^3b^9c^3d^2g^6 - 10a^4b^8c^2d^3g^6 + 5a^5b^7cd^4g^6 - a^6b^6d^5g^6)x^4 + 10(a^2b^
\end{aligned}$$



$$\begin{aligned}
& b^{10}c^5g^6 - 5a^3b^9c^4d^4g^6 + 10a^4b^8c^3d^2g^6 - 10a^5b^7c^2d^3g^6 + 5a^6b^6c^4d^4g^6 - a^7b^5d^5g^6) * x^3 + 10(a^3b^9c^5g^6 - 5a^4b^8c^4d^4g^6 + 10a^5b^7c^3d^2g^6 - 10a^6b^6c^2d^3g^6 + 5a^7b^5c^4d^4g^6 - a^8b^4d^5g^6) * x^2 + 5(a^4b^8c^5g^6 - 5a^5b^7c^4d^4g^6 + 10a^6b^6c^3d^2g^6 - 10a^7b^5c^2d^3g^6 + 5a^8b^4c^4d^4g^6 - a^9b^3d^5g^6) * x) * B^2 * c * d * i^2 - 1/54000 * (60 * ((47a^2b^4c^4 - 278a^3b^3c^3d + 822a^4b^2c^2d^2 - 278a^5b^c^3d + 47a^6d^4 + 60 * (10b^6c^2d^2 - 5a^b^5c^3d + a^2b^4d^4) * x^4 - 30 * (10b^6c^3d - 95a^b^5c^2d^2 + 46a^2b^4c^3d - 9a^3b^3d^4) * x^3 + 10 * (20b^6c^4 - 140a^b^5c^3d + 537a^2b^4c^2d^2 - 248a^3b^3c^3d + 47a^4b^2d^4) * x^2 + 5 * (35a^b^5c^4 - 218a^2b^4c^3d + 702a^3b^3c^2d^2 - 278a^4b^2c^3d + 47a^5b^d^4) * x) / ((b^12c^4 - 4a^b^11c^3d + 6a^2b^10c^2d^2 - 4a^3b^9c^3d + a^4b^8d^4) * g^6 * x^5 + 5 * (a^b^11c^4 - 4a^2b^10c^3d + 6a^3b^9c^2d^2 - 4a^4b^8c^3d + a^5b^7d^4) * g^6 * x^4 + 10 * (a^2b^10c^4 - 4a^3b^9c^3d + 6a^4b^8c^2d^2 - 4a^5b^7c^3d + a^6b^6d^4) * g^6 * x^3 + 10 * (a^3b^9c^4 - 4a^4b^8c^3d + 6a^5b^7c^2d^2 - 4a^6b^6c^3d + a^7b^5d^4) * g^6 * x^2 + 5 * (a^4b^8c^4 - 4a^5b^7c^3d + 6a^6b^6c^2d^2 - 4a^7b^5c^3d + a^8b^4d^4) * g^6 * x + (a^5b^7c^4 - 4a^6b^6c^3d + 6a^7b^5c^2d^2 - 4a^8b^4c^3d + a^9b^3d^4) * g^6) + 60 * (10b^2c^2d^3 - 5a^b^c^3d^4 + a^2d^5) * log(b*x + a) / ((b^8c^5 - 5a^b^7c^4d + 10a^2b^6c^3d^2 - 10a^3b^5c^2d^3 + 5a^4b^4c^3d^4 - a^5b^3d^5) * g^6) - 60 * (10b^2c^2d^3 - 5a^b^c^3d^4 + a^2d^5) * log(d*x + c) / ((b^8c^5 - 5a^b^7c^4d + 10a^2b^6c^3d^2 - 10a^3b^5c^2d^3 + 5a^4b^4c^3d^4 - a^5b^3d^5) * g^6)) * log(b*e*x / (d*x + c) + a*e / (d*x + c)) + (1489a^2b^5c^5 - 14375a^3b^4c^4d + 85000a^4b^3c^3d^2 - 85000a^5b^2c^2d^3 + 14375a^6b^c^4d - 1489a^7d^5 + 60 * (1100b^7c^3d^2 - 1425a^b^6c^2d^3 + 372a^2b^5c^3d^4 - 47a^3b^4d^5) * x^4 - 30 * (500b^7c^4d - 9825a^b^6c^3d^2 + 11937a^2b^5c^2d^3 - 2975a^3b^4c^3d^4 + 363a^4b^3d^5) * x^3 + 10 * (400b^7c^5 - 5450a^b^6c^4d + 49189a^2b^5c^3d^2 - 55525a^3b^4c^2d^3 + 12875a^4b^3c^3d^4 - 1489a^5b^2d^5) * x^2 - 1800 * (10a^5b^2c^2d^3 - 5a^6b^c^3d^4 + a^7d^5 + (10b^7c^2d^3 - 5a^b^6c^3d^4 + a^2b^5d^5) * x^5 + 5 * (10a^b^6c^2d^3 - 5a^2b^5c^3d^4 + a^3b^4d^5) * x^4 + 10 * (10a^2b^5c^2d^3 - 5a^3b^4c^3d^4 + a^4b^3d^5) * x^3 + 10 * (10a^3b^4c^2d^3 - 5a^4b^3c^3d^4 + a^5b^2d^5) * x^2 + 5 * (10a^4b^3c^2d^3 - 5a^5b^2c^3d^4 + a^6b^d^5) * x) * log(b*x + a)^2 - 1800 * (10a^5b^2c^2d^3 - 5a^6b^c^3d^4 + a^7d^5 + (10b^7c^2d^3 - 5a^b^6c^3d^4 + a^2b^5d^5) * x^5 + 5 * (10a^b^6c^2d^3 - 5a^2b^5c^3d^4 + a^3b^4d^5) * x^4 + 10 * (10a^2b^5c^2d^3 - 5a^3b^4c^3d^4 + a^4b^3d^5) * x^3 + 10 * (10a^3b^4c^2d^3 - 5a^4b^3c^3d^4 + a^5b^2d^5) * x^2 + 5 * (10a^4b^3c^2d^3 - 5a^5b^2c^3d^4 + a^6b^d^5) * x) * log(d*x + c)^2 + 5 * (925a^b^6c^5 - 9911a^2b^5c^4d + 67900a^3b^4c^3d^2 - 71800a^4b^3c^2d^3 + 14375a^5b^2c^3d^4 - 1489a^6b^d^5) * x + 60 * (1100a^5b^2c^2d^3 - 325a^6b^c^3d^4 + 47a^7d^5 + (1100b^7c^2d^3 - 325a^b^6c^3d^4 + 47a^2b^5d^5) * x^5 + 5 * (1100a^b^6c^2d^3 - 325a^2b^5c^3d^4 + 47a^3b^4d^5) * x^4 + 10 * (1100a^2b^5c^2d^3 - 325a^3b^4c^3d^4 + 47a^4b^3d^5) * x^3 + 10 * (1100a^3b^4c^2d^3 -
\end{aligned}$$

$$\begin{aligned}
& 325a^4b^3c^2d^4 + 47a^5b^2d^5)x^2 + 5(1100a^4b^3c^2d^3 - 325a^5b^2c^2d^4 + 47a^6b^2d^5)x \cdot \log(bx + a) - 60(1100a^5b^2c^2d^3 - 325a^6b^2c^2d^4 + 47a^7d^5 + (1100b^7c^2d^3 - 325a^2b^6c^2d^4 + 47a^2b^5d^5)x^5 + 5(1100a^2b^6c^2d^3 - 325a^2b^5c^2d^4 + 47a^3b^4d^5)x^4 + 10(1100a^2b^5c^2d^3 - 325a^3b^4c^2d^4 + 47a^4b^3d^5)x^3 + 10(1100a^3b^4c^2d^3 - 325a^4b^3c^2d^4 + 47a^5b^2d^5)x^2 + 5(1100a^4b^3c^2d^3 - 325a^5b^2c^2d^4 + 47a^6b^2d^5)x - 60(10a^5b^2c^2d^3 - 5a^6b^2c^2d^4 + a^7d^5 + (10b^7c^2d^3 - 5a^2b^6c^2d^4 + a^2b^5d^5)x^5 + 5(10a^2b^6c^2d^3 - 5a^2b^5c^2d^4 + a^3b^4d^5)x^4 + 10(10a^2b^5c^2d^3 - 5a^3b^4c^2d^4 + a^4b^3d^5)x^3 + 10(10a^3b^4c^2d^3 - 5a^4b^3c^2d^4 + a^5b^2d^5)x^2 + 5(10a^4b^3c^2d^3 - 5a^5b^2c^2d^4 + a^6b^2d^5)x) \cdot \log(bx + a) \cdot \log(dx + c) / (a^5b^8c^5g^6 - 5a^6b^7c^4d^4g^6 + 10a^7b^6c^3d^2g^6 - 10a^8b^5c^2d^3g^6 + 5a^9b^4c^2d^4g^6 - a^{10}b^3d^5g^6 + (b^{13}c^5g^6 - 5a^2b^{12}c^4d^4g^6 + 10a^2b^{11}c^3d^2g^6 - 10a^3b^{10}c^2d^3g^6 + 5a^4b^9c^2d^4g^6 - a^5b^8d^5g^6)x^5 + 5(a^2b^{12}c^5g^6 - 5a^2b^{11}c^4d^4g^6 + 10a^3b^{10}c^3d^2g^6 - 10a^4b^9c^2d^3g^6 + 5a^5b^8c^2d^4g^6 - a^6b^7d^5g^6)x^4 + 10(a^2b^{11}c^5g^6 - 5a^3b^{10}c^4d^4g^6 + 10a^4b^9c^3d^2g^6 - 10a^5b^8c^2d^3g^6 + 5a^6b^7c^2d^4g^6 - a^7b^6d^5g^6)x^3 + 10(a^3b^{10}c^5g^6 - 5a^4b^9c^4d^4g^6 + 10a^5b^8c^3d^2g^6 - 10a^6b^7c^2d^3g^6 + 5a^7b^6c^2d^4g^6 - a^8b^5d^5g^6)x^2 + 5(a^4b^9c^5g^6 - 5a^5b^8c^4d^4g^6 + 10a^6b^7c^3d^2g^6 - 10a^7b^6c^2d^3g^6 + 5a^8b^5c^2d^4g^6 - a^9b^4d^5g^6)x) \cdot B^2d^2i^2 - 1/900A^2B^2d^2i^2(60(10b^2x^2 + 5a^2bx + a^2) \cdot \log(b^2x^2/(dx + c) + a^2/(dx + c)) / (b^8g^6x^5 + 5a^2b^7g^6x^4 + 10a^2b^6g^6x^3 + 10a^3b^5g^6x^2 + 5a^4b^4g^6x + a^5b^3g^6) + (47a^2b^4c^4 - 278a^3b^3c^3d + 822a^4b^2c^2d^2 - 278a^5b^2c^2d^3 + 47a^6d^4 + 60(10b^6c^2d^2 - 5a^2b^5c^2d^3 + a^2b^4d^4)x^4 - 30(10b^6c^3d - 95a^2b^5c^2d^2 + 46a^2b^4c^2d^3 - 9a^3b^3d^4)x^3 + 10(20b^6c^4 - 140a^2b^5c^3d + 537a^2b^4c^2d^2 - 248a^3b^3c^2d^3 + 47a^4b^2d^4)x^2 + 5(35a^2b^5c^4 - 218a^2b^4c^3d + 702a^3b^3c^2d^2 - 278a^4b^2c^2d^3 + 47a^5b^2d^4)x) / ((b^{12}c^4 - 4a^2b^{11}c^3d + 6a^2b^{10}c^2d^2 - 4a^3b^9c^2d^3 + a^4b^8d^4)g^6x^5 + 5(a^2b^{11}c^4 - 4a^2b^{10}c^3d + 6a^3b^9c^2d^2 - 4a^4b^8c^2d^3 + a^5b^7d^4)g^6x^4 + 10(a^2b^{10}c^4 - 4a^3b^9c^3d + 6a^4b^8c^2d^2 - 4a^5b^7c^2d^3 + a^6b^6d^4)g^6x^3 + 10(a^3b^9c^4 - 4a^4b^8c^3d + 6a^5b^7c^2d^2 - 4a^6b^6c^2d^3 + a^7b^5d^4)g^6x^2 + 5(a^4b^8c^4 - 4a^5b^7c^3d + 6a^6b^6c^2d^2 - 4a^7b^5c^2d^3 + a^8b^4d^4)g^6x + (a^5b^7c^4 - 4a^6b^6c^3d + 6a^7b^5c^2d^2 - 4a^8b^4c^2d^3 + a^9b^3d^4)g^6) + 60(10b^2c^2d^3 - 5a^2b^2c^2d^4 + a^2d^5) \cdot \log(bx + a) / ((b^8c^5 - 5a^2b^7c^4d + 10a^2b^6c^3d^2 - 10a^3b^5c^2d^3 + 5a^4b^4c^2d^4 - a^5b^3d^5)g^6) - 60(10b^2c^2d^3 - 5a^2b^2c^2d^4 + a^2d^5) \cdot \log(dx + c) / ((b^8c^5 - 5a^2b^7c^4d + 10a^2b^6c^3d^2 - 10a^3b^5c^2d^3 + 5a^4b^4c^2d^4 - a^5b^3d^5)g^6) - 1/300A^2B^2c^2d^2i^2(60(5b^2x + a) \cdot \log(b^2x^2/(dx + c) + a^2/(dx + c)) / (b^7g^6x^5 + 5a^2b^6g^6x^4 + 10a^2b^5g^6x^3 + 10a^3b^4g^6x^2 +
\end{aligned}$$

$$\begin{aligned}
& 5a^4b^3g^6x + a^5b^2g^6) + (27a^4b^3c^4 - 148a^2b^3c^3d + 352a^3b^2c^2d^2 - 548a^4b^3c^3d^3 + 77a^5d^4 - 60(5b^5c^3d^3 - ab^4d^4) \\
& )x^4 + 30(5b^5c^2d^2 - 46ab^4c^3d^3 + 9a^2b^3d^4)x^3 - 10(10b^5c^3d - 67ab^4c^2d^2 + 248a^2b^3c^3d^3 - 47a^3b^2d^4)x^2 + 5(1 \\
& 5b^5c^4 - 88ab^4c^3d + 232a^2b^3c^2d^2 - 428a^3b^2c^3d^3 + 77a^4b^2d^4)x) / ((b^{11}c^4 - 4a^2b^{10}c^3d + 6a^2b^9c^2d^2 - 4a^3b^8c^3d^3 + a^4b^7d^4)g^6x^5 + 5(a^2b^{10}c^4 - 4a^2b^9c^3d + 6a^3b^8c^2d^2 - 4a^4b^7c^3d^3 + a^5b^6d^4)g^6x^4 + 10(a^2b^9c^4 - 4a^3b^8c^3d + 6a^4b^7c^2d^2 - 4a^5b^6c^3d^3 + a^6b^5d^4)g^6x^3 + 10(a^3b^8c^4 - 4a^4b^7c^3d + 6a^5b^6c^2d^2 - 4a^6b^5c^3d^3 + a^7b^4d^4)g^6x^2 + 5(a^4b^7c^4 - 4a^5b^6c^3d + 6a^6b^5c^2d^2 - 4a^7b^4c^3d^3 + a^8b^3d^4)g^6x + (a^5b^6c^4 - 4a^6b^5c^3d + 6a^7b^4c^2d^2 - 4a^8b^3c^3d^3 + a^9b^2d^4)g^6) - 60(5b^3c^4d - ad^5) \\
& * \log(bx + a) / ((b^7c^5 - 5a^2b^6c^4d + 10a^2b^5c^3d^2 - 10a^3b^4c^2d^3 + 5a^4b^3c^3d^4 - a^5b^2d^5)g^6) + 60(5b^3c^4d - ad^5) * \log(dx + c) / ((b^7c^5 - 5a^2b^6c^4d + 10a^2b^5c^3d^2 - 10a^3b^4c^2d^3 + 5a^4b^3c^3d^4 - a^5b^2d^5)g^6)) - 1/150A^2B^2c^2i^2((60b^4d^4x^4 + 12b^4c^4 - 63a^2b^3c^3d + 137a^2b^2c^2d^2 - 163a^3b^3c^3d^3 + 137a^4d^4 - 30(b^4c^3d^3 - 9a^2b^3d^4)x^3 + 10(2b^4c^2d^2 - 13a^2b^3c^3d^3 + 47a^2b^2d^4)x^2 - 5(3b^4c^3d - 17a^2b^3c^2d^2 + 43a^2b^2c^3d - 77a^3b^2d^4)x) / ((b^{10}c^4 - 4a^2b^9c^3d + 6a^2b^8c^2d^2 - 4a^3b^7c^3d^3 + a^4b^6d^4)g^6x^5 + 5(a^2b^9c^4 - 4a^2b^8c^3d + 6a^3b^7c^2d^2 - 4a^4b^6c^3d^3 + a^5b^5d^4)g^6x^4 + 10(a^2b^8c^4 - 4a^3b^7c^3d + 6a^4b^6c^2d^2 - 4a^5b^5c^3d^3 + a^6b^4d^4)g^6x^3 + 10(a^3b^7c^4 - 4a^4b^6c^3d + 6a^5b^5c^2d^2 - 4a^6b^4c^3d^3 + a^7b^3d^4)g^6x^2 + 5(a^4b^6c^4 - 4a^5b^5c^3d + 6a^6b^4c^2d^2 - 4a^7b^3c^3d^3 + a^8b^2d^4)g^6x + (a^5b^5c^4 - 4a^6b^4c^3d + 6a^7b^3c^2d^2 - 4a^8b^2c^3d^3 + a^9b^2d^4)g^6) + 60 * \log(bex/(dx + c) + ae/(dx + c)) / (b^6g^6x^5 + 5a^2b^5g^6x^4 + 10a^2b^4g^6x^3 + 10a^3b^3g^6x^2 + 5a^4b^2g^6x + a^5b^2g^6) + 60d^5 * \log(bx + a) / ((b^6c^5 - 5a^2b^5c^4d + 10a^2b^4c^3d^2 - 10a^3b^3c^2d^3 + 5a^4b^2c^3d^4 - a^5b^2d^5)g^6) - 60d^5 * \log(dx + c) / ((b^6c^5 - 5a^2b^5c^4d + 10a^2b^4c^3d^2 - 10a^3b^3c^2d^3 + 5a^4b^2c^3d^4 - a^5b^2d^5)g^6)) - 1/5B^2c^2i^2 * \log(bex/(dx + c) + ae/(dx + c))^2 / (b^6g^6x^5 + 5a^2b^5g^6x^4 + 10a^2b^4g^6x^3 + 10a^3b^3g^6x^2 + 5a^4b^2g^6x + a^5b^2g^6) - 1/10(5bx + a)A^2c^2d^2i^2 / (b^7g^6x^5 + 5a^2b^6g^6x^4 + 10a^2b^5g^6x^3 + 10a^3b^4g^6x^2 + 5a^4b^3g^6x + a^5b^2g^6) - 1/30(10b^2x^2 + 5a^2bx + a^2)A^2d^2i^2 / (b^8g^6x^5 + 5a^2b^7g^6x^4 + 10a^2b^6g^6x^3 + 10a^3b^5g^6x^2 + 5a^4b^4g^6x + a^5b^3g^6) - 1/5A^2c^2i^2 / (b^6g^6x^5 + 5a^2b^5g^6x^4 + 10a^2b^4g^6x^3 + 10a^3b^3g^6x^2 + 5a^4b^2g^6x + a^5b^2g^6)
\end{aligned}$$

**Fricas [B]** time = 0.632417, size = 2804, normalized size = 6.06

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^6,x, algorithm="fricas")

[Out] 
$$\begin{aligned} & -1/54000*(60*((60*A*B + 47*B^2)*b^5*c*d^4 - (60*A*B + 47*B^2)*a*b^4*d^5)*i^2*x^4 - 30*((60*A*B - 13*B^2)*b^5*c^2*d^3 - 50*(12*A*B + 7*B^2)*a*b^4*c*d^4 \\ & + 3*(180*A*B + 121*B^2)*a^2*b^3*d^5)*i^2*x^3 + 10*(2*(900*A^2 + 60*A*B - 43*B^2)*b^5*c^3*d^2 - 75*(72*A^2 + 12*A*B - 5*B^2)*a*b^4*c^2*d^3 + 600*(9*A^2 + 6*A*B + 2*B^2)*a^2*b^3*c*d^4 - (1800*A^2 + 2820*A*B + 1489*B^2)*a^3*b^2*d^5)*i^2*x^2 + 5*(27*(200*A^2 + 60*A*B + 7*B^2)*b^5*c^4*d - 100*(144*A^2 + 60*A*B + 11*B^2)*a*b^4*c^3*d^2 + 1200*(9*A^2 + 6*A*B + 2*B^2)*a^2*b^3*c^2*d^3 - (1800*A^2 + 2820*A*B + 1489*B^2)*a^4*b*d^5)*i^2*x + (432*(25*A^2 + 10*A*B + 2*B^2)*b^5*c^5 - 3375*(8*A^2 + 4*A*B + B^2)*a*b^4*c^4*d + 2000*(9*A^2 + 6*A*B + 2*B^2)*a^2*b^3*c^3*d^2 - (1800*A^2 + 2820*A*B + 1489*B^2)*a^5*d^5)*i^2 + 1800*(B^2*b^5*d^5*i^2*x^5 + 5*B^2*a*b^4*d^5*i^2*x^4 + 10*B^2*a^2*b^3*d^5*i^2*x^3 + 10*(B^2*b^5*c^3*d^2 - 3*B^2*a*b^4*c^2*d^3 + 3*B^2*a^2*b^3*c*d^4)*i^2*x^2 + 5*(3*B^2*b^5*c^4*d - 8*B^2*a*b^4*c^3*d^2 + 6*B^2*a^2*b^3*c^2*d^3)*i^2*x + (6*B^2*b^5*c^5 - 15*B^2*a*b^4*c^4*d + 10*B^2*a^2*b^3*c^3*d^2)*i^2)*log((b*e*x + a*e)/(d*x + c))^2 + 60*((60*A*B + 47*B^2)*b^5*d^5*i^2*x^5 + 5*(12*B^2*b^5*c*d^4 + 5*(12*A*B + 7*B^2)*a*b^4*d^5)*i^2*x^4 - 10*(3*B^2*b^5*c^2*d^3 - 30*B^2*a*b^4*c*d^4 - 20*(3*A*B + B^2)*a^2*b^3*d^5)*i^2*x^3 + 10*(2*(30*A*B + B^2)*b^5*c^3*d^2 - 15*(12*A*B + B^2)*a*b^4*c^2*d^3 + 60*(3*A*B + B^2)*a^2*b^3*c*d^4)*i^2*x^2 + 5*(9*(20*A*B + 3*B^2)*b^5*c^4*d - 20*(24*A*B + 5*B^2)*a*b^4*c^3*d^2 + 120*(3*A*B + B^2)*a^2*b^3*c^2*d^3)*i^2*x + (72*(5*A*B + B^2)*b^5*c^5 - 225*(4*A*B + B^2)*a*b^4*c^4*d + 200*(3*A*B + B^2)*a^2*b^3*c^3*d^2)*i^2)*log((b*e*x + a*e)/(d*x + c))/((b^11*c^3 - 3*a*b^10*c^2*d + 3*a^2*b^9*c*d^2 - a^3*b^8*d^3)*g^6*x^5 + 5*(a*b^10*c^3 - 3*a^2*b^9*c^2*d + 3*a^3*b^8*c*d^2 - a^4*b^7*d^3)*g^6*x^4 + 10*(a^2*b^9*c^3 - 3*a^3*b^8*c^2*d + 3*a^4*b^7*c*d^2 - a^5*b^6*d^3)*g^6*x^3 + 10*(a^3*b^8*c^3 - 3*a^4*b^7*c^2*d + 3*a^5*b^6*c*d^2 - a^6*b^5*d^3)*g^6*x^2 + 5*(a^4*b^7*c^3 - 3*a^5*b^6*c^2*d + 3*a^6*b^5*c*d^2 - a^7*b^4*d^3)*g^6*x + (a^5*b^6*c^3 - 3*a^6*b^5*c^2*d + 3*a^7*b^4*c*d^2 - a^8*b^3*d^3)*g^6) \end{aligned}$$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))*2/(b*g*x+a*g)**6,x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2 \left( B \log \left( \frac{(bx+a)e}{dx+c} \right) + A \right)^2}{(bgx + ag)^6} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^6,x, algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^2*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g)^6, x)
```

$$3.74 \quad \int (ag + bgx)^3 (ci + dix)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx$$

**Optimal.** Leaf size=1089

result too large to display

```
[Out] (5*B^2*(b*c - a*d)^6*g^3*i^3*x)/(84*b^3*d^3) + (B^2*(b*c - a*d)^3*g^3*i^3*(a + b*x)^4)/(140*b^4) - (29*B^2*(b*c - a*d)^5*g^3*i^3*(c + d*x)^2)/(840*b^2*d^4) + (47*B^2*(b*c - a*d)^4*g^3*i^3*(c + d*x)^3)/(1260*b*d^4) - (13*B^2*(b*c - a*d)^3*g^3*i^3*(c + d*x)^4)/(420*d^4) + (b*B^2*(b*c - a*d)^2*g^3*i^3*(c + d*x)^5)/(105*d^4) - (B^2*(b*c - a*d)^7*g^3*i^3*Log[(a + b*x)/(c + d*x)])/(210*b^4*d^4) - (B*(b*c - a*d)^4*g^3*i^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x])))/(210*b^4*d) - (3*B*(b*c - a*d)^3*g^3*i^3*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x])))/(140*b^4) - (B*(b*c - a*d)^2*g^3*i^3*(a + b*x)^4*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x])))/(35*b^3) + (2*B*(b*c - a*d)^4*g^3*i^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x])))/(21*b*d^4) - (3*B*(b*c - a*d)^3*g^3*i^3*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x])))/(14*d^4) + (6*b*B*(b*c - a*d)^2*g^3*i^3*(c + d*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x])))/(35*d^4) - (b^2*B*(b*c - a*d)*g^3*i^3*(c + d*x)^6*(A + B*Log[(e*(a + b*x))/(c + d*x])))/(21*d^4) + ((b*c - a*d)^3*g^3*i^3*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2)/(140*b^4) + ((b*c - a*d)^2*g^3*i^3*(a + b*x)^4*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2)/(35*b^3) + ((b*c - a*d)*g^3*i^3*(a + b*x)^4*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2)/(14*b^2) + (g^3*i^3*(a + b*x)^4*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2)/(7*b) + (B*(b*c - a*d)^5*g^3*i^3*(a + b*x)^2*(3*A + B + 3*B*Log[(e*(a + b*x))/(c + d*x]]))/(420*b^4*d^2) - (B*(b*c - a*d)^6*g^3*i^3*(a + b*x)*(6*A + 5*B + 6*B*Log[(e*(a + b*x))/(c + d*x]]))/(420*b^4*d^3) - (B*(b*c - a*d)^7*g^3*i^3*Log[(b*c - a*d)/(b*(c + d*x))]*(6*A + 11*B + 6*B*Log[(e*(a + b*x))/(c + d*x]]))/(420*b^4*d^4) - (11*B^2*(b*c - a*d)^7*g^3*i^3*Log[c + d*x]/(420*b^4*d^4) - (B^2*(b*c - a*d)^7*g^3*i^3*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(70*b^4*d^4)
```

**Rubi [A]** time = 4.27025, antiderivative size = 896, normalized size of antiderivative = 0.82, number of steps used = 122, number of rules used = 13, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.31$ , Rules used = {2528, 2525, 12, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{B^2 g^3 i^3 \log^2(c + dx)(bc - ad)^7}{140 b^4 d^4} - \frac{B^2 g^3 i^3 \log\left(-\frac{d(a+bx)}{bc-ad}\right) \log(c + dx)(bc - ad)^7}{70 b^4 d^4} + \frac{B g^3 i^3 \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right) \log(c + dx)(bc - ad)^7}{70 b^4 d^4}$$

Antiderivative was successfully verified.

[In] Int[(a\*g + b\*g\*x)^3\*(c\*i + d\*i\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2, x]

[Out] 
$$-(A*B*(b*c - a*d)^6*g^3*i^3*x)/(70*b^3*d^3) + (B^2*(b*c - a*d)^6*g^3*i^3*x)/(70*b^3*d^3) - (3*B^2*(b*c - a*d)^5*g^3*i^3*(a + b*x)^2)/(280*b^4*d^2) + (11*B^2*(b*c - a*d)^4*g^3*i^3*(a + b*x)^3)/(1260*b^4*d) + (B^2*(b*c - a*d)^3*g^3*i^3*(a + b*x)^4)/(42*b^4) + (B^2*d*(b*c - a*d)^2*g^3*i^3*(a + b*x)^5)/(105*b^4) - (B^2*(b*c - a*d)^6*g^3*i^3*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/(70*b^4*d^3) + (B*(b*c - a*d)^5*g^3*i^3*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(140*b^4*d^2) - (B*(b*c - a*d)^4*g^3*i^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(210*b^4*d) - (17*B*(b*c - a*d)^3*g^3*i^3*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(140*b^4) - (B*d*(b*c - a*d)^2*g^3*i^3*(a + b*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(7*b^4) - (B*d^2*(b*c - a*d)*g^3*i^3*(a + b*x)^6*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(21*b^4) + ((b*c - a*d)^3*g^3*i^3*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(4*b^4) + (3*d*(b*c - a*d)^2*g^3*i^3*(a + b*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(5*b^4) + (d^2*(b*c - a*d)*g^3*i^3*(a + b*x)^6*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*b^4) + (d^3*g^3*i^3*(a + b*x)^7*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(7*b^4) - (B^2*(b*c - a*d)^7*g^3*i^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(70*b^4*d^4) + (B*(b*c - a*d)^7*g^3*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(70*b^4*d^4) + (B^2*(b*c - a*d)^7*g^3*i^3*Log[c + d*x]^2)/(140*b^4*d^4) - (B^2*(b*c - a*d)^7*g^3*i^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(70*b^4*d^4)$$

### Rule 2528

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*(RGx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

### Rule 2525

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*((d\_.) + (e\_.)\*(x\_))^(m\_.), x\_Symbol] := Simp[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^n)/(e\*(m + 1)), x] - Dist[(b\*n\*p)/(e\*(m + 1)), Int[SimplifyIntegrand[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

### Rule 12

Int[(a\_)\*(u\_), x\_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b\_)\*(v\_)] /; FreeQ[b, x]

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(n_), x_Symbol] := Simp[Log[RemoveContent[a + b*x, x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && LeQ[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(Rfx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, Rfx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[Rfx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393



```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]*(b_.))^(p_.)*((f_.) + (g_.
)*(x_)^(q_.)), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rubi steps

$$\begin{aligned}
\int (74c + 74dx)^3 (ag + bgx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx &= \int \left( \frac{(-bc + ad)^3 g^3 (74c + 74dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d^3} + \frac{3b}{d} \right) dx \\
&= \frac{(b^3 g^3) \int (74c + 74dx)^6 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{405224d^3} - \frac{(3b^2(bc - ad)^3 g^3 (74c + 74dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{405224d^3} \\
&= -\frac{101306(bc - ad)^3 g^3 (c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d^4} + \frac{121596(bc - ad)^3 g^3 (c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d^4} \\
&= -\frac{101306(bc - ad)^3 g^3 (c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d^4} + \frac{121596(bc - ad)^3 g^3 (c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d^4} \\
&= -\frac{101306(bc - ad)^3 g^3 (c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d^4} + \frac{121596(bc - ad)^3 g^3 (c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d^4} \\
&= -\frac{101306(bc - ad)^3 g^3 (c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d^4} + \frac{121596(bc - ad)^3 g^3 (c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d^4} \\
&= \frac{202612AB(bc - ad)^6 g^3 x}{35b^3 d^3} + \frac{101306B(bc - ad)^5 g^3 (c + dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{35b^2 d^4} \\
&= \frac{202612AB(bc - ad)^6 g^3 x}{35b^3 d^3} + \frac{202612B^2(bc - ad)^6 g^3 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{35b^4 d^3} \\
&= \frac{202612AB(bc - ad)^6 g^3 x}{35b^3 d^3} + \frac{202612B^2(bc - ad)^6 g^3 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{35b^4 d^3} \\
&= \frac{202612AB(bc - ad)^6 g^3 x}{35b^3 d^3} + \frac{202612B^2(bc - ad)^6 g^3 x}{35b^3 d^3} + \frac{151956B^2(bc - ad)^6 g^3 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{35b^3 d^3} \\
&= \frac{202612AB(bc - ad)^6 g^3 x}{35b^3 d^3} + \frac{202612B^2(bc - ad)^6 g^3 x}{35b^3 d^3} + \frac{151956B^2(bc - ad)^6 g^3 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{35b^3 d^3} \\
&= \frac{202612AB(bc - ad)^6 g^3 x}{35b^3 d^3} + \frac{202612B^2(bc - ad)^6 g^3 x}{35b^3 d^3} + \frac{151956B^2(bc - ad)^6 g^3 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{35b^3 d^3} \\
&= \frac{202612AB(bc - ad)^6 g^3 x}{35b^3 d^3} + \frac{202612B^2(bc - ad)^6 g^3 x}{35b^3 d^3} + \frac{151956B^2(bc - ad)^6 g^3 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{35b^3 d^3}
\end{aligned}$$

**Mathematica [B]** time = 3.14045, size = 2330, normalized size = 2.14

Result too large to show

Antiderivative was successfully verified.

[In] Integrate[(a\*g + b\*g\*x)^3\*(c\*i + d\*i\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2,x]

[Out] (g^3\*i^3\*(35\*(b\*c - a\*d)^3\*(a + b\*x)^4\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2 + 84\*d\*(b\*c - a\*d)^2\*(a + b\*x)^5\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2 + 70\*d^2\*(b\*c - a\*d)\*(a + b\*x)^6\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2 + 20\*d^3\*(a + b\*x)^7\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2 - (35\*B\*(b\*c - a\*d)^4\*(6\*A\*b\*d\*(b\*c - a\*d)^2\*x + 6\*B\*d\*(b\*c - a\*d)^2\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x)] + 3\*d^2\*(-(b\*c) + a\*d)\*(a + b\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) + 2\*d^3\*(a + b\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) - 6\*B\*(b\*c - a\*d)^3\*Log[c + d\*x] - 6\*(b\*c - a\*d)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])\*Log[c + d\*x] + B\*(b\*c - a\*d)\*(2\*b\*d\*(b\*c - a\*d)\*x - d^2\*(a + b\*x)^2 - 2\*(b\*c - a\*d)^2\*Log[c + d\*x]) + 3\*B\*(b\*c - a\*d)^2\*(b\*d\*x + (-(b\*c) + a\*d)\*Log[c + d\*x]) + 3\*B\*(b\*c - a\*d)^3\*((2\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)] - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])))/(3\*d^4) + (7\*B\*(b\*c - a\*d)^3\*(24\*A\*b\*d\*(b\*c - a\*d)^3\*x + 24\*B\*d\*(b\*c - a\*d)^3\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x)] - 12\*d^2\*(b\*c - a\*d)^2\*(a + b\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) + 8\*d^3\*(b\*c - a\*d)\*(a + b\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) - 6\*d^4\*(a + b\*x)^4\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) - 24\*B\*(b\*c - a\*d)^4\*Log[c + d\*x] - 24\*(b\*c - a\*d)^4\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])\*Log[c + d\*x] + 4\*B\*(b\*c - a\*d)^2\*(2\*b\*d\*(b\*c - a\*d)\*x - d^2\*(a + b\*x)^2 - 2\*(b\*c - a\*d)^2\*Log[c + d\*x]) + B\*(b\*c - a\*d)\*(6\*b\*d\*(b\*c - a\*d)^2\*x + 3\*d^2\*(-(b\*c) + a\*d)\*(a + b\*x)^2 + 2\*d^3\*(a + b\*x)^3 - 6\*(b\*c - a\*d)^3\*Log[c + d\*x]) + 12\*B\*(b\*c - a\*d)^3\*(b\*d\*x + (-(b\*c) + a\*d)\*Log[c + d\*x]) + 12\*B\*(b\*c - a\*d)^4\*((2\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)] - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])))/d^4 - (7\*B\*(b\*c - a\*d)^2\*(24\*b^2\*B\*c\*d\*(b\*c - a\*d)^3\*x + 120\*A\*b\*d\*(b\*c - a\*d)^4\*x + 130\*b\*B\*d\*(b\*c - a\*d)^4\*x + 24\*a\*b\*B\*d^2\*(-(b\*c) + a\*d)^3\*x - 12\*b\*B\*c\*d^2\*(b\*c - a\*d)^2\*(a + b\*x)^2 + 12\*a\*B\*d^3\*(b\*c - a\*d)^2\*(a + b\*x)^2 + 35\*B\*d^2\*(-(b\*c) + a\*d)^3\*(a + b\*x)^2 + 8\*b\*B\*c\*d^3\*(b\*c - a\*d)\*(a + b\*x)^3 + 10\*B\*d^3\*(b\*c - a\*d)^2\*(a + b\*x)^3 + 8\*a\*B\*d^4\*(-(b\*c) + a\*d)\*(a + b\*x)^3 - 6\*b\*B\*c\*d^4\*(a + b\*x)^4 + 6\*a\*B\*d^5\*(a + b\*x)^4 + 120\*B\*d\*(b\*c - a\*d)^4\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x)] + 60\*d^2\*(-(b\*c) + a\*d)^3\*(a + b\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) + 40\*d^3\*(b\*c - a\*d)^2\*(a + b\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) + 30\*d^4\*(-(b\*c) + a\*d)\*(a + b\*x)^4\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) + 24\*d^5\*(a + b\*x)^5\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) - 24\*b\*B\*c\*(b\*c - a\*d)^4\*Log[c + d\*x] + 24\*a\*B\*d\*(b\*c - a\*d)^4\*Log[c + d\*x] - 250\*B\*(b\*c - a\*d)^5\*Log[c + d\*x] - 120\*(b\*c - a\*d)^5\*

$$\begin{aligned} & (A + B \cdot \text{Log}[(e \cdot (a + b \cdot x)) / (c + d \cdot x)]) \cdot \text{Log}[c + d \cdot x] + 60 \cdot B \cdot (b \cdot c - a \cdot d)^5 \cdot ((2 \cdot \\ & \text{Log}[(d \cdot (a + b \cdot x)) / (-(b \cdot c) + a \cdot d)] - \text{Log}[c + d \cdot x]) \cdot \text{Log}[c + d \cdot x] + 2 \cdot \text{PolyLog}[ \\ & 2, (b \cdot (c + d \cdot x)) / (b \cdot c - a \cdot d)]) / (6 \cdot d^4) + (B \cdot (b \cdot c - a \cdot d) \cdot (60 \cdot b^2 \cdot B \cdot c \cdot d \cdot (b \cdot \\ & c - a \cdot d)^4 \cdot x - 60 \cdot a \cdot b \cdot B \cdot d^2 \cdot (b \cdot c - a \cdot d)^4 \cdot x + 360 \cdot A \cdot b \cdot d \cdot (b \cdot c - a \cdot d)^5 \cdot x + 4 \\ & 62 \cdot b \cdot B \cdot d \cdot (b \cdot c - a \cdot d)^5 \cdot x - 30 \cdot b \cdot B \cdot c \cdot d^2 \cdot (b \cdot c - a \cdot d)^3 \cdot (a + b \cdot x)^2 + 30 \cdot a \cdot B \cdot \\ & d^3 \cdot (b \cdot c - a \cdot d)^3 \cdot (a + b \cdot x)^2 - 141 \cdot B \cdot d^2 \cdot (b \cdot c - a \cdot d)^4 \cdot (a + b \cdot x)^2 + 20 \cdot b \cdot \\ & B \cdot c \cdot d^3 \cdot (b \cdot c - a \cdot d)^2 \cdot (a + b \cdot x)^3 - 20 \cdot a \cdot B \cdot d^4 \cdot (b \cdot c - a \cdot d)^2 \cdot (a + b \cdot x)^3 + \\ & 54 \cdot B \cdot d^3 \cdot (b \cdot c - a \cdot d)^3 \cdot (a + b \cdot x)^3 - 15 \cdot b \cdot B \cdot c \cdot d^4 \cdot (b \cdot c - a \cdot d) \cdot (a + b \cdot x)^4 + \\ & 15 \cdot a \cdot B \cdot d^5 \cdot (b \cdot c - a \cdot d) \cdot (a + b \cdot x)^4 - 18 \cdot B \cdot d^4 \cdot (b \cdot c - a \cdot d)^2 \cdot (a + b \cdot x)^4 + \\ & 12 \cdot b \cdot B \cdot c \cdot d^5 \cdot (a + b \cdot x)^5 - 12 \cdot a \cdot B \cdot d^6 \cdot (a + b \cdot x)^5 + 360 \cdot B \cdot d \cdot (b \cdot c - a \cdot d)^5 \cdot ( \\ & a + b \cdot x) \cdot \text{Log}[(e \cdot (a + b \cdot x)) / (c + d \cdot x)] - 180 \cdot d^2 \cdot (b \cdot c - a \cdot d)^4 \cdot (a + b \cdot x)^2 \cdot ( \\ & A + B \cdot \text{Log}[(e \cdot (a + b \cdot x)) / (c + d \cdot x)]) + 120 \cdot d^3 \cdot (b \cdot c - a \cdot d)^3 \cdot (a + b \cdot x)^3 \cdot (A \\ & + B \cdot \text{Log}[(e \cdot (a + b \cdot x)) / (c + d \cdot x)]) - 90 \cdot d^4 \cdot (b \cdot c - a \cdot d)^2 \cdot (a + b \cdot x)^4 \cdot (A + B \\ & \cdot \text{Log}[(e \cdot (a + b \cdot x)) / (c + d \cdot x)]) + 72 \cdot d^5 \cdot (b \cdot c - a \cdot d) \cdot (a + b \cdot x)^5 \cdot (A + B \cdot \text{Log}[ \\ & (e \cdot (a + b \cdot x)) / (c + d \cdot x)]) - 60 \cdot d^6 \cdot (a + b \cdot x)^6 \cdot (A + B \cdot \text{Log}[(e \cdot (a + b \cdot x)) / (c \\ & + d \cdot x)]) - 60 \cdot b \cdot B \cdot c \cdot (b \cdot c - a \cdot d)^5 \cdot \text{Log}[c + d \cdot x] + 60 \cdot a \cdot B \cdot d \cdot (b \cdot c - a \cdot d)^5 \cdot \text{Log} \\ & [c + d \cdot x] - 822 \cdot B \cdot (b \cdot c - a \cdot d)^6 \cdot \text{Log}[c + d \cdot x] - 360 \cdot (b \cdot c - a \cdot d)^6 \cdot (A + B \cdot \text{Log} \\ & [(e \cdot (a + b \cdot x)) / (c + d \cdot x)]) \cdot \text{Log}[c + d \cdot x] + 180 \cdot B \cdot (b \cdot c - a \cdot d)^6 \cdot ((2 \cdot \text{Log}[(d \cdot (a \\ & + b \cdot x)) / (-(b \cdot c) + a \cdot d)] - \text{Log}[c + d \cdot x]) \cdot \text{Log}[c + d \cdot x] + 2 \cdot \text{PolyLog}[2, (b \cdot (c \\ & + d \cdot x)) / (b \cdot c - a \cdot d)])) / (9 \cdot d^4)) / (140 \cdot b^4) \end{aligned}$$

**Maple [F]** time = 2.264, size = 0, normalized size = 0.

$$\int (bgx + ag)^3 (dix + ci)^3 \left( A + B \ln \left( \frac{e(bx + a)}{dx + c} \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^3\*(d\*i\*x+c\*i)^3\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2,x)

[Out] int((b\*g\*x+a\*g)^3\*(d\*i\*x+c\*i)^3\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2,x)

**Maxima [B]** time = 2.37413, size = 9343, normalized size = 8.58

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(d\*i\*x+c\*i)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2,x, algorithm="maxima")

```
[Out] 1/7*A^2*b^3*d^3*g^3*i^3*x^7 + 1/2*A^2*b^3*c*d^2*g^3*i^3*x^6 + 1/2*A^2*a*b^2
*d^3*g^3*i^3*x^6 + 3/5*A^2*b^3*c^2*d*g^3*i^3*x^5 + 9/5*A^2*a*b^2*c*d^2*g^3*
i^3*x^5 + 3/5*A^2*a^2*b*d^3*g^3*i^3*x^5 + 1/4*A^2*b^3*c^3*g^3*i^3*x^4 + 9/4
*A^2*a*b^2*c^2*d*g^3*i^3*x^4 + 9/4*A^2*a^2*b*c*d^2*g^3*i^3*x^4 + 1/4*A^2*a^
3*d^3*g^3*i^3*x^4 + A^2*a*b^2*c^3*g^3*i^3*x^3 + 3*A^2*a^2*b*c^2*d*g^3*i^3*x
^3 + A^2*a^3*c*d^2*g^3*i^3*x^3 + 3/2*A^2*a^2*b*c^3*g^3*i^3*x^2 + 3/2*A^2*a^
3*c^2*d*g^3*i^3*x^2 + 2*(x*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + a*log(b*x
+ a)/b - c*log(d*x + c)/d)*A*B*a^3*c^3*g^3*i^3 + 3*(x^2*log(b*e*x/(d*x + c
) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a
*d)*x/(b*d))*A*B*a^2*b*c^3*g^3*i^3 + (2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x
+ c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d
^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a*b^2*c^3*g^3*i^3 + 1/12*
(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^
4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*
d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*b^3*c^3*g^3*i^3 + 3*(x^2
*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x
+ c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*a^3*c^2*d*g^3*i^3 + 3*(2*x^3*log(b*e*x/
(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^
3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a^2*
b*c^2*d*g^3*i^3 + 3/4*(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log
(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 -
3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*a*
b^2*c^2*d*g^3*i^3 + 1/10*(12*x^5*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 12*
a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)
*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 -
12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*A*B*b^3*c^2*d*g^3*i^3 + (2*x^3*log(b*e
*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)
/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a
^3*c*d^2*g^3*i^3 + 3/4*(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log
(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 -
3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*a
^2*b*c*d^2*g^3*i^3 + 3/10*(12*x^5*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 12
*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)
*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 -
12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*A*B*a*b^2*c*d^2*g^3*i^3 + 1/60*(60*x^
6*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 60*a^6*log(b*x + a)/b^6 + 60*c^6*log
(d*x + c)/d^6 - (12*(b^5*c*d^4 - a*b^4*d^5)*x^5 - 15*(b^5*c^2*d^3 - a^2*b
^3*d^5)*x^4 + 20*(b^5*c^3*d^2 - a^3*b^2*d^5)*x^3 - 30*(b^5*c^4*d - a^4*b*d^
5)*x^2 + 60*(b^5*c^5 - a^5*d^5)*x)/(b^5*d^5))*A*B*b^3*c*d^2*g^3*i^3 + 1/12*
(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^
4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*
d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*a^3*d^3*g^3*i^3 + 1/10*(
12*x^5*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 12*a^5*log(b*x + a)/b^5 - 12*
c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^
2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/
```

$$\begin{aligned}
& (b^4 d^4) * A * B * a^2 * b * d^3 * g^3 i^3 + 1/60 * (60 * x^6 * \log(b * e * x / (d * x + c)) + a * e / (d * x + c)) - 60 * a^6 * \log(b * x + a) / b^6 + 60 * c^6 * \log(d * x + c) / d^6 - (12 * (b^5 * c * d^4 - a * b^4 * d^5) * x^5 - 15 * (b^5 * c^2 * d^3 - a^2 * b^3 * d^5) * x^4 + 20 * (b^5 * c^3 * d^2 - a^3 * b^2 * d^5) * x^3 - 30 * (b^5 * c^4 * d - a^4 * b * d^5) * x^2 + 60 * (b^5 * c^5 - a^5 * d^5) * x) / (b^5 * d^5) * A * B * a * b^2 * d^3 * g^3 i^3 + 1/210 * (60 * x^7 * \log(b * e * x / (d * x + c)) + a * e / (d * x + c)) + 60 * a^7 * \log(b * x + a) / b^7 - 60 * c^7 * \log(d * x + c) / d^7 - (10 * (b^6 * c * d^5 - a * b^5 * d^6) * x^6 - 12 * (b^6 * c^2 * d^4 - a^2 * b^4 * d^6) * x^5 + 15 * (b^6 * c^3 * d^3 - a^3 * b^3 * d^6) * x^4 - 20 * (b^6 * c^4 * d^2 - a^4 * b^2 * d^6) * x^3 + 30 * (b^6 * c^5 * d - a^5 * b * d^6) * x^2 - 60 * (b^6 * c^6 - a^6 * d^6) * x) / (b^6 * d^6) * A * B * b^3 * d^3 * g^3 i^3 + A^2 * a^3 * c^3 * g^3 i^3 * x + 1/420 * (6 * b^6 * c^7 * g^3 i^3 * \log(e) - 107 * a^4 * b^2 * c^3 * d^4 * g^3 i^3 + 39 * a^5 * b * c^2 * d^5 * g^3 i^3 - 6 * a^6 * c * d^6 * g^3 i^3 - 6 * (7 * g^3 i^3 * \log(e) - g^3 i^3) * a * b^5 * c^6 * d + 3 * (42 * g^3 i^3 * \log(e) - 13 * g^3 i^3) * a^2 * b^4 * c^5 * d^2 - (210 * g^3 i^3 * \log(e) - 107 * g^3 i^3) * a^3 * b^3 * c^4 * d^3) * B^2 * \log(d * x + c) / (b^3 * d^4) + 1/70 * (b^7 * c^7 * g^3 i^3 - 7 * a * b^6 * c^6 * d * g^3 i^3 + 21 * a^2 * b^5 * c^5 * d^2 * g^3 i^3 - 35 * a^3 * b^4 * c^4 * d^3 * g^3 i^3 + 35 * a^4 * b^3 * c^3 * d^4 * g^3 i^3 - 21 * a^5 * b^2 * c^2 * d^5 * g^3 i^3 + 7 * a^6 * b * c * d^6 * g^3 i^3 - a^7 * d^7 * g^3 i^3) * (\log(b * x + a) * \log((b * d * x + a * d) / (b * c - a * d)) + 1) + \operatorname{dilog}(-(b * d * x + a * d) / (b * c - a * d)) * B^2 / (b^4 * d^4) + 1/2520 * (360 * B^2 * b^7 * d^7 * g^3 i^3 * x^7 * \log(e)^2 + 60 * ((21 * g^3 i^3 * \log(e))^2 - 2 * g^3 i^3 * \log(e)) * b^7 * c * d^6 + (21 * g^3 i^3 * \log(e))^2 + 2 * g^3 i^3 * \log(e)) * a * b^6 * d^7) * B^2 * x^6 + 24 * ((63 * g^3 i^3 * \log(e))^2 - 15 * g^3 i^3 * \log(e) + g^3 i^3) * b^7 * c^2 * d^5 + (189 * g^3 i^3 * \log(e))^2 - 2 * g^3 i^3 * a * b^6 * c * d^6 + (63 * g^3 i^3 * \log(e))^2 + 15 * g^3 i^3 * \log(e) + g^3 i^3) * a^2 * b^5 * d^7) * B^2 * x^5 + 6 * ((105 * g^3 i^3 * \log(e))^2 - 51 * g^3 i^3 * \log(e) + 10 * g^3 i^3) * b^7 * c^3 * d^4 + (945 * g^3 i^3 * \log(e))^2 - 147 * g^3 i^3 * \log(e) - 10 * g^3 i^3) * a * b^6 * c^2 * d^5 + (945 * g^3 i^3 * \log(e))^2 + 147 * g^3 i^3 * \log(e) - 10 * g^3 i^3) * a^2 * b^5 * c * d^6 + (105 * g^3 i^3 * \log(e))^2 + 51 * g^3 i^3 * \log(e) + 10 * g^3 i^3) * a^3 * b^4 * d^7) * B^2 * x^4 - 2 * ((6 * g^3 i^3 * \log(e) - 11 * g^3 i^3) * b^7 * c^4 * d^3 - 4 * (315 * g^3 i^3 * \log(e))^2 - 147 * g^3 i^3 * \log(e) + 19 * g^3 i^3) * a * b^6 * c^3 * d^4 - 6 * (630 * g^3 i^3 * \log(e))^2 - 29 * g^3 i^3) * a^2 * b^5 * c^2 * d^5 - 4 * (315 * g^3 i^3 * \log(e))^2 + 147 * g^3 i^3 * \log(e) + 19 * g^3 i^3) * a^3 * b^4 * c * d^6 - (6 * g^3 i^3 * \log(e) + 11 * g^3 i^3) * a^4 * b^3 * d^7) * B^2 * x^3 + 3 * (3 * (2 * g^3 i^3 * \log(e) - 3 * g^3 i^3) * b^7 * c^5 * d^2 - (42 * g^3 i^3 * \log(e) - 67 * g^3 i^3) * a * b^6 * c^4 * d^3 + 2 * (630 * g^3 i^3 * \log(e))^2 - 252 * g^3 i^3 * \log(e) - 29 * g^3 i^3) * a^2 * b^5 * c^3 * d^4 + 2 * (630 * g^3 i^3 * \log(e))^2 + 252 * g^3 i^3 * \log(e) - 29 * g^3 i^3) * a^3 * b^4 * c^2 * d^5 + (42 * g^3 i^3 * \log(e) + 67 * g^3 i^3) * a^4 * b^3 * c * d^6 - 3 * (2 * g^3 i^3 * \log(e) + 3 * g^3 i^3) * a^5 * b^2 * d^7) * B^2 * x^2 - 6 * (6 * (g^3 i^3 * \log(e) - g^3 i^3) * b^7 * c^6 * d - 3 * (14 * g^3 i^3 * \log(e) - 15 * g^3 i^3) * a * b^6 * c^5 * d^2 + 2 * (63 * g^3 i^3 * \log(e) - 73 * g^3 i^3) * a^2 * b^5 * c^4 * d^3 - 2 * (210 * g^3 i^3 * \log(e))^2 - 107 * g^3 i^3) * a^3 * b^4 * c^3 * d^4 - 2 * (63 * g^3 i^3 * \log(e) + 73 * g^3 i^3) * a^4 * b^3 * c^2 * d^5 + 3 * (14 * g^3 i^3 * \log(e) + 15 * g^3 i^3) * a^5 * b^2 * c * d^6 - 6 * (g^3 i^3 * \log(e) + g^3 i^3) * a^6 * b * d^7) * B^2 * x + 18 * (20 * B^2 * b^7 * d^7 * g^3 i^3 * x^7 + 140 * B^2 * a^3 * b^4 * c^3 * d^4 * g^3 i^3 * x + 70 * (b^7 * c * d^6 * g^3 i^3 + a * b^6 * d^7 * g^3 i^3) * B^2 * x^6 + 84 * (b^7 * c^2 * d^5 * g^3 i^3 + 3 * a * b^6 * c * d^6 * g^3 i^3 + a^2 * b^5 * d^7 * g^3 i^3) * B^2 * x^5 + 35 * (b^7 * c^3 * d^4 * g^3 i^3 + 9 * a * b^6 * c^2 * d^5 * g^3 i^3 + 9 * a^2 * b^5 * c * d^6 * g^3 i^3 + a^3 * b^4 * d^7 * g^3 i^3) * B^2 * x^4 + 140 * (a * b^6 * c^3 * d^4 * g^3 i^3 + 3 * a^2 * b^5 * c^2 * d^5 * g^3 i^3 + a^3 * b^4 * c * d^6 * g^3 i^3
\end{aligned}$$

$$\begin{aligned}
& *i^3)*B^2*x^3 + 210*(a^2*b^5*c^3*d^4*g^3*i^3 + a^3*b^4*c^2*d^5*g^3*i^3)*B^2 \\
& *x^2 + (35*a^4*b^3*c^3*d^4*g^3*i^3 - 21*a^5*b^2*c^2*d^5*g^3*i^3 + 7*a^6*b*c \\
& *d^6*g^3*i^3 - a^7*d^7*g^3*i^3)*B^2)*\log(b*x + a)^2 + 18*(20*B^2*b^7*d^7*g^ \\
& 3*i^3*x^7 + 140*B^2*a^3*b^4*c^3*d^4*g^3*i^3*x + 70*(b^7*c*d^6*g^3*i^3 + a*b \\
& ^6*d^7*g^3*i^3)*B^2*x^6 + 84*(b^7*c^2*d^5*g^3*i^3 + 3*a*b^6*c*d^6*g^3*i^3 + \\
& a^2*b^5*d^7*g^3*i^3)*B^2*x^5 + 35*(b^7*c^3*d^4*g^3*i^3 + 9*a*b^6*c^2*d^5*g \\
& ^3*i^3 + 9*a^2*b^5*c*d^6*g^3*i^3 + a^3*b^4*d^7*g^3*i^3)*B^2*x^4 + 140*(a*b^ \\
& 6*c^3*d^4*g^3*i^3 + 3*a^2*b^5*c^2*d^5*g^3*i^3 + a^3*b^4*c*d^6*g^3*i^3)*B^2* \\
& x^3 + 210*(a^2*b^5*c^3*d^4*g^3*i^3 + a^3*b^4*c^2*d^5*g^3*i^3)*B^2*x^2 - (b^ \\
& 7*c^7*g^3*i^3 - 7*a*b^6*c^6*d*g^3*i^3 + 21*a^2*b^5*c^5*d^2*g^3*i^3 - 35*a^3 \\
& *b^4*c^4*d^3*g^3*i^3)*B^2)*\log(d*x + c)^2 + 6*(120*B^2*b^7*d^7*g^3*i^3*x^7* \\
& \log(e) + 20*((21*g^3*i^3*\log(e) - g^3*i^3)*b^7*c*d^6 + (21*g^3*i^3*\log(e) + \\
& g^3*i^3)*a*b^6*d^7)*B^2*x^6 + 12*(126*a*b^6*c*d^6*g^3*i^3*\log(e) + (42*g^3 \\
& *i^3*\log(e) - 5*g^3*i^3)*b^7*c^2*d^5 + (42*g^3*i^3*\log(e) + 5*g^3*i^3)*a^2* \\
& b^5*d^7)*B^2*x^5 + 3*((70*g^3*i^3*\log(e) - 17*g^3*i^3)*b^7*c^3*d^4 + 7*(90* \\
& g^3*i^3*\log(e) - 7*g^3*i^3)*a*b^6*c^2*d^5 + 7*(90*g^3*i^3*\log(e) + 7*g^3*i^ \\
& 3)*a^2*b^5*c*d^6 + (70*g^3*i^3*\log(e) + 17*g^3*i^3)*a^3*b^4*d^7)*B^2*x^4 + \\
& 2*(1260*a^2*b^5*c^2*d^5*g^3*i^3*\log(e) - b^7*c^4*d^3*g^3*i^3 + a^4*b^3*d^7* \\
& g^3*i^3 + 14*(30*g^3*i^3*\log(e) - 7*g^3*i^3)*a*b^6*c^3*d^4 + 14*(30*g^3*i^3 \\
& *\log(e) + 7*g^3*i^3)*a^3*b^4*c*d^6)*B^2*x^3 + 3*(b^7*c^5*d^2*g^3*i^3 - 7*a* \\
& b^6*c^4*d^3*g^3*i^3 + 7*a^4*b^3*c*d^6*g^3*i^3 - a^5*b^2*d^7*g^3*i^3 + 84*(5 \\
& *g^3*i^3*\log(e) - g^3*i^3)*a^2*b^5*c^3*d^4 + 84*(5*g^3*i^3*\log(e) + g^3*i^3 \\
& )*a^3*b^4*c^2*d^5)*B^2*x^2 + 6*(140*a^3*b^4*c^3*d^4*g^3*i^3*\log(e) - b^7*c^ \\
& 6*d*g^3*i^3 + 7*a*b^6*c^5*d^2*g^3*i^3 - 21*a^2*b^5*c^4*d^3*g^3*i^3 + 21*a^4 \\
& *b^3*c^2*d^5*g^3*i^3 - 7*a^5*b^2*c*d^6*g^3*i^3 + a^6*b*d^7*g^3*i^3)*B^2*x - \\
& (6*a^7*d^7*g^3*i^3*\log(e) + 6*a*b^6*c^6*d*g^3*i^3 - 39*a^2*b^5*c^5*d^2*g^3 \\
& *i^3 + 107*a^3*b^4*c^4*d^3*g^3*i^3 - (210*g^3*i^3*\log(e) + 107*g^3*i^3)*a^4 \\
& *b^3*c^3*d^4 + 3*(42*g^3*i^3*\log(e) + 13*g^3*i^3)*a^5*b^2*c^2*d^5 - 6*(7*g^ \\
& 3*i^3*\log(e) + g^3*i^3)*a^6*b*c*d^6)*B^2)*\log(b*x + a) - 6*(120*B^2*b^7*d^7 \\
& *g^3*i^3*x^7*\log(e) + 20*((21*g^3*i^3*\log(e) - g^3*i^3)*b^7*c*d^6 + (21*g^3 \\
& *i^3*\log(e) + g^3*i^3)*a*b^6*d^7)*B^2*x^6 + 12*(126*a*b^6*c*d^6*g^3*i^3*\log \\
& (e) + (42*g^3*i^3*\log(e) - 5*g^3*i^3)*b^7*c^2*d^5 + (42*g^3*i^3*\log(e) + 5* \\
& g^3*i^3)*a^2*b^5*d^7)*B^2*x^5 + 3*((70*g^3*i^3*\log(e) - 17*g^3*i^3)*b^7*c^3 \\
& *d^4 + 7*(90*g^3*i^3*\log(e) - 7*g^3*i^3)*a*b^6*c^2*d^5 + 7*(90*g^3*i^3*\log( \\
& e) + 7*g^3*i^3)*a^2*b^5*c*d^6 + (70*g^3*i^3*\log(e) + 17*g^3*i^3)*a^3*b^4*d^ \\
& 7)*B^2*x^4 + 2*(1260*a^2*b^5*c^2*d^5*g^3*i^3*\log(e) - b^7*c^4*d^3*g^3*i^3 + \\
& a^4*b^3*d^7*g^3*i^3 + 14*(30*g^3*i^3*\log(e) - 7*g^3*i^3)*a*b^6*c^3*d^4 + 1 \\
& 4*(30*g^3*i^3*\log(e) + 7*g^3*i^3)*a^3*b^4*c*d^6)*B^2*x^3 + 3*(b^7*c^5*d^2*g \\
& ^3*i^3 - 7*a*b^6*c^4*d^3*g^3*i^3 + 7*a^4*b^3*c*d^6*g^3*i^3 - a^5*b^2*d^7*g^ \\
& 3*i^3 + 84*(5*g^3*i^3*\log(e) - g^3*i^3)*a^2*b^5*c^3*d^4 + 84*(5*g^3*i^3*\log \\
& (e) + g^3*i^3)*a^3*b^4*c^2*d^5)*B^2*x^2 + 6*(140*a^3*b^4*c^3*d^4*g^3*i^3*lo \\
& g(e) - b^7*c^6*d*g^3*i^3 + 7*a*b^6*c^5*d^2*g^3*i^3 - 21*a^2*b^5*c^4*d^3*g^3 \\
& *i^3 + 21*a^4*b^3*c^2*d^5*g^3*i^3 - 7*a^5*b^2*c*d^6*g^3*i^3 + a^6*b*d^7*g^3 \\
& *i^3)*B^2*x + 6*(20*B^2*b^7*d^7*g^3*i^3*x^7 + 140*B^2*a^3*b^4*c^3*d^4*g^3*i \\
& ^3*x + 70*(b^7*c*d^6*g^3*i^3 + a*b^6*d^7*g^3*i^3)*B^2*x^6 + 84*(b^7*c^2*d^5
\end{aligned}$$

$$\begin{aligned} & *g^3i^3 + 3*a*b^6*c*d^6*g^3i^3 + a^2*b^5*d^7*g^3i^3)*B^2*x^5 + 35*(b^7*c \\ & ^3*d^4*g^3i^3 + 9*a*b^6*c^2*d^5*g^3i^3 + 9*a^2*b^5*c*d^6*g^3i^3 + a^3*b^ \\ & 4*d^7*g^3i^3)*B^2*x^4 + 140*(a*b^6*c^3*d^4*g^3i^3 + 3*a^2*b^5*c^2*d^5*g^3 \\ & i^3 + a^3*b^4*c*d^6*g^3i^3)*B^2*x^3 + 210*(a^2*b^5*c^3*d^4*g^3i^3 + a^3* \\ & b^4*c^2*d^5*g^3i^3)*B^2*x^2 + (35*a^4*b^3*c^3*d^4*g^3i^3 - 21*a^5*b^2*c^2 \\ & *d^5*g^3i^3 + 7*a^6*b*c*d^6*g^3i^3 - a^7*d^7*g^3i^3)*B^2)*\log(b*x + a)* \\ & \log(d*x + c))/(b^4*d^4) \end{aligned}$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( A^2 b^3 d^3 g^3 i^3 x^6 + A^2 a^3 c^3 g^3 i^3 + 3 (A^2 b^3 c d^2 + A^2 a b^2 d^3) g^3 i^3 x^5 + 3 (A^2 b^3 c^2 d + 3 A^2 a b^2 c d^2 + A^2 a^2 b d^3) g^3 i^3 x^4 + \dots \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(d\*i\*x+c\*i)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2,x, algorithm="fricas")

[Out] integral(A^2\*b^3\*d^3\*g^3\*i^3\*x^6 + A^2\*a^3\*c^3\*g^3\*i^3 + 3\*(A^2\*b^3\*c\*d^2 + A^2\*a\*b^2\*d^3)\*g^3\*i^3\*x^5 + 3\*(A^2\*b^3\*c^2\*d + 3\*A^2\*a\*b^2\*c\*d^2 + A^2\*a^2\*b\*d^3)\*g^3\*i^3\*x^4 + (A^2\*b^3\*c^3 + 9\*A^2\*a\*b^2\*c^2\*d + 9\*A^2\*a^2\*b\*c\*d^2 + A^2\*a^3\*d^3)\*g^3\*i^3\*x^3 + 3\*(A^2\*a\*b^2\*c^3 + 3\*A^2\*a^2\*b\*c^2\*d + A^2\*a^3\*c\*d^2)\*g^3\*i^3\*x^2 + 3\*(A^2\*a^2\*b\*c^3 + A^2\*a^3\*c^2\*d)\*g^3\*i^3\*x + (B^2\*b^3\*d^3\*g^3\*i^3\*x^6 + B^2\*a^3\*c^3\*g^3\*i^3 + 3\*(B^2\*b^3\*c\*d^2 + B^2\*a\*b^2\*d^3)\*g^3\*i^3\*x^5 + 3\*(B^2\*b^3\*c^2\*d + 3\*B^2\*a\*b^2\*c\*d^2 + B^2\*a^2\*b\*d^3)\*g^3\*i^3\*x^4 + (B^2\*b^3\*c^3 + 9\*B^2\*a\*b^2\*c^2\*d + 9\*B^2\*a^2\*b\*c\*d^2 + B^2\*a^3\*d^3)\*g^3\*i^3\*x^3 + 3\*(B^2\*a\*b^2\*c^3 + 3\*B^2\*a^2\*b\*c^2\*d + B^2\*a^3\*c\*d^2)\*g^3\*i^3\*x^2 + 3\*(B^2\*a^2\*b\*c^3 + B^2\*a^3\*c^2\*d)\*g^3\*i^3\*x)\*log((b\*e\*x + a\*e)/(d\*x + c))^2 + 2\*(A\*B\*b^3\*d^3\*g^3\*i^3\*x^6 + A\*B\*a^3\*c^3\*g^3\*i^3 + 3\*(A\*B\*b^3\*c\*d^2 + A\*B\*a\*b^2\*d^3)\*g^3\*i^3\*x^5 + 3\*(A\*B\*b^3\*c^2\*d + 3\*A\*B\*a\*b^2\*c\*d^2 + A\*B\*a^2\*b\*d^3)\*g^3\*i^3\*x^4 + (A\*B\*b^3\*c^3 + 9\*A\*B\*a\*b^2\*c^2\*d + 9\*A\*B\*a^2\*b\*c\*d^2 + A\*B\*a^3\*d^3)\*g^3\*i^3\*x^3 + 3\*(A\*B\*a\*b^2\*c^3 + 3\*A\*B\*a^2\*b\*c^2\*d + A\*B\*a^3\*c\*d^2)\*g^3\*i^3\*x^2 + 3\*(A\*B\*a^2\*b\*c^3 + A\*B\*a^3\*c^2\*d)\*g^3\*i^3\*x)\*log((b\*e\*x + a\*e)/(d\*x + c)), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.



```
[In] integrate((b*g*x+a*g)**3*(d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int (bgx + ag)^3 (dix + ci)^3 \left( B \log \left( \frac{(bx + a)e}{dx + c} \right) + A \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(d*i*x + c*i)^3*(B*log((b*x + a)*e/(d*x + c)) + A)^2, x)
```

$$3.75 \quad \int (ag + bgx)^2 (ci + dix)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx$$

**Optimal.** Leaf size=908

$$\frac{B^2 g^2 i^3 \log \left( \frac{a+bx}{c+dx} \right) (bc-ad)^6}{36b^4 d^3} + \frac{B g^2 i^3 \log \left( \frac{bc-ad}{b(c+dx)} \right) \left( 2A + 3B + 2B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) (bc-ad)^6}{60b^4 d^3} + \frac{11B^2 g^2 i^3 \log(c+dx)(bc-ad)^6}{180b^4 d^3}$$

[Out]  $(-7*B^2*(b*c - a*d)^5*g^2*i^3*x)/(180*b^3*d^2) - (7*B^2*(b*c - a*d)^4*g^2*i^3*(c + d*x)^2)/(360*b^2*d^3) - (B^2*(b*c - a*d)^3*g^2*i^3*(c + d*x)^3)/(60*b*d^3) + (B^2*(b*c - a*d)^2*g^2*i^3*(c + d*x)^4)/(60*d^3) + (B^2*(b*c - a*d)^6*g^2*i^3*Log[(a + b*x)/(c + d*x)])/(36*b^4*d^3) - (B*(b*c - a*d)^4*g^2*i^3*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(60*b^4*d) - (B*(b*c - a*d)^3*g^2*i^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(30*b^4) - (B*(b*c - a*d)^4*g^2*i^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(10*b^2*d^3) + (B*(b*c - a*d)^3*g^2*i^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(45*b*d^3) + (7*B*(b*c - a*d)^2*g^2*i^3*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(60*d^3) - (b*B*(b*c - a*d)*g^2*i^3*(c + d*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(15*d^3) + ((b*c - a*d)^3*g^2*i^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]^2)/(60*b^4) + ((b*c - a*d)^2*g^2*i^3*(a + b*x)^3*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]^2)/(20*b^3) + ((b*c - a*d)*g^2*i^3*(a + b*x)^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]^2)/(10*b^2) + (g^2*i^3*(a + b*x)^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]^2)/(6*b) + (B*(b*c - a*d)^5*g^2*i^3*(a + b*x)*(2*A + B + 2*B*Log[(e*(a + b*x))/(c + d*x)]))/(60*b^4*d^2) + (B*(b*c - a*d)^6*g^2*i^3*Log[(b*c - a*d)/(b*(c + d*x))]*(2*A + 3*B + 2*B*Log[(e*(a + b*x))/(c + d*x)]))/(60*b^4*d^3) + (11*B^2*(b*c - a*d)^6*g^2*i^3*Log[c + d*x])/(180*b^4*d^3) + (B^2*(b*c - a*d)^6*g^2*i^3*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(30*b^4*d^3)$

**Rubi [A]** time = 3.02211, antiderivative size = 825, normalized size of antiderivative = 0.91, number of steps used = 86, number of rules used = 13, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.31$ , Rules used = {2528, 2525, 12, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 43}

$$\frac{B^2 g^2 i^3 \log^2(a+bx)(bc-ad)^6}{60b^4 d^3} - \frac{B^2 g^2 i^3 \log(a+bx)(bc-ad)^6}{45b^4 d^3} - \frac{B g^2 i^3 \log(a+bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) (bc-ad)^6}{30b^4 d^3} + \frac{B^2 g^2 i^3 \log^2(a+bx)(bc-ad)^6}{180b^4 d^3}$$

Antiderivative was successfully verified.

[In] Int[(a\*g + b\*g\*x)^2\*(c\*i + d\*i\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]^2, x]

```
[Out] -(A*B*(b*c - a*d)^5*g^2*i^3*x)/(30*b^3*d^2) - (B^2*(b*c - a*d)^5*g^2*i^3*x)
/(45*b^3*d^2) - (7*B^2*(b*c - a*d)^4*g^2*i^3*(c + d*x)^2)/(360*b^2*d^3) - (
B^2*(b*c - a*d)^3*g^2*i^3*(c + d*x)^3)/(60*b*d^3) + (B^2*(b*c - a*d)^2*g^2*
i^3*(c + d*x)^4)/(60*d^3) - (B^2*(b*c - a*d)^6*g^2*i^3*Log[a + b*x])/(45*b^
4*d^3) + (B^2*(b*c - a*d)^6*g^2*i^3*Log[a + b*x]^2)/(60*b^4*d^3) - (B^2*(b*
c - a*d)^5*g^2*i^3*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/(30*b^4*d^2) - (
B*(b*c - a*d)^4*g^2*i^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x]))/(
60*b^2*d^3) - (B*(b*c - a*d)^3*g^2*i^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))
/(c + d*x)]))/(90*b*d^3) + (7*B*(b*c - a*d)^2*g^2*i^3*(c + d*x)^4*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)]))/(60*d^3) - (b*B*(b*c - a*d)*g^2*i^3*(c + d*x)^
5*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(15*d^3) - (B*(b*c - a*d)^6*g^2*i^3
*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(30*b^4*d^3) + ((b*c -
a*d)^2*g^2*i^3*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2)/(4*d^3)
- (2*b*(b*c - a*d)*g^2*i^3*(c + d*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x]])
^2)/(5*d^3) + (b^2*g^2*i^3*(c + d*x)^6*(A + B*Log[(e*(a + b*x))/(c + d*x]])
^2)/(6*d^3) + (B^2*(b*c - a*d)^6*g^2*i^3*Log[c + d*x])/(30*b^4*d^3) - (B^2*
(b*c - a*d)^6*g^2*i^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)]/(30*b^4*
d^3) - (B^2*(b*c - a*d)^6*g^2*i^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])
/(30*b^4*d^3)
```

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.)
^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^

```

$q)^r]^s)/b, x] + \text{Dist}[(q*r*s*(b*c - a*d))/b, \text{Int}[\text{Log}[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^{(s - 1)/(c + d*x)}, x], x] /;$  FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]

### Rule 31

$\text{Int}[(a + b*x)^{-1}, x\_Symbol] := \text{Simp}[\text{Log}[\text{RemoveContent}[a + b*x, x]]/b, x] /;$  FreeQ[{a, b}, x]

### Rule 2524

$\text{Int}[(a + \text{Log}[c*(Rf_x)^p]*b)^n / (d + e*x), x\_Symbol] := \text{Simp}[(\text{Log}[d + e*x]*(a + b*\text{Log}[c*Rf_x^p])^n)/e, x] - \text{Dist}[(b*n*p)/e, \text{Int}[(\text{Log}[d + e*x]*(a + b*\text{Log}[c*Rf_x^p])^{(n - 1)*D[Rf_x, x]})/Rf_x, x], x] /;$  FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rf\_x, x] && IGtQ[n, 0]

### Rule 2418

$\text{Int}[(a + \text{Log}[c*(d + e*x)^n]*b)^p*(Rf_x), x\_Symbol] := \text{With}[\{u = \text{ExpandIntegrand}[(a + b*\text{Log}[c*(d + e*x)^n])^p, Rf_x, x]\}, \text{Int}[u, x] /; \text{SumQ}[u] /;$  FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[Rf\_x, x] && IntegerQ[p]

### Rule 2390

$\text{Int}[(a + \text{Log}[c*(d + e*x)^n]*b)^p*(f + g*x)^q, x\_Symbol] := \text{Dist}[1/e, \text{Subst}[\text{Int}[(f*x)/d]^q*(a + b*\text{Log}[c*x^n])^p, x], x, d + e*x], x] /;$  FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

### Rule 2301

$\text{Int}[(a + \text{Log}[c*x^n]*b)/x, x\_Symbol] := \text{Simp}[(a + b*\text{Log}[c*x^n])^2/(2*b*n), x] /;$  FreeQ[{a, b, c, n}, x]

### Rule 2394

$\text{Int}[(a + \text{Log}[c*(d + e*x)^n]*b) / (f + g*x), x\_Symbol] := \text{Simp}[(\text{Log}[(e*(f + g*x))/(e*f - d*g)]*(a + b*\text{Log}[c*(d + e*x)^n]))/g, x] - \text{Dist}[(b*e*n)/g, \text{Int}[\text{Log}[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /;$  FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rule 43

```
Int[((a_.) + (b_.)*(x_)^(m_.))*((c_.) + (d_.)*(x_)^(n_.)), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

### Rubi steps

$$\begin{aligned}
\int (75c + 75dx)^3 (ag + bgx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx &= \int \left( \frac{(-bc + ad)^2 g^2 (75c + 75dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d^2} - \frac{2b(75c + 75dx)^3 (ag + bgx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d} \right) dx \\
&= \frac{(b^2 g^2) \int (75c + 75dx)^5 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{5625 d^2} - \frac{2b(75c + 75dx)^3 (ag + bgx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d} \\
&= \frac{421875(bc - ad)^2 g^2 (c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{4d^3} - \frac{168750(bc - ad)^2 g^2 (c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{4d^3} \\
&= \frac{421875(bc - ad)^2 g^2 (c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{4d^3} - \frac{168750(bc - ad)^2 g^2 (c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{4d^3} \\
&= \frac{421875(bc - ad)^2 g^2 (c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{4d^3} - \frac{168750(bc - ad)^2 g^2 (c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{4d^3} \\
&= \frac{421875(bc - ad)^2 g^2 (c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{4d^3} - \frac{168750(bc - ad)^2 g^2 (c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{4d^3} \\
&= -\frac{28125AB(bc - ad)^5 g^2 x}{2b^3 d^2} - \frac{28125B(bc - ad)^4 g^2 (c + dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{4b^2 d^3} \\
&= -\frac{28125AB(bc - ad)^5 g^2 x}{2b^3 d^2} - \frac{28125B^2(bc - ad)^5 g^2 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{2b^4 d^2} \\
&= -\frac{28125AB(bc - ad)^5 g^2 x}{2b^3 d^2} - \frac{28125B^2(bc - ad)^5 g^2 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{2b^4 d^2} \\
&= -\frac{28125AB(bc - ad)^5 g^2 x}{2b^3 d^2} - \frac{9375B^2(bc - ad)^5 g^2 x}{b^3 d^2} - \frac{65625B^2(bc - ad)^5 g^2 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^3 d^2} \\
&= -\frac{28125AB(bc - ad)^5 g^2 x}{2b^3 d^2} - \frac{9375B^2(bc - ad)^5 g^2 x}{b^3 d^2} - \frac{65625B^2(bc - ad)^5 g^2 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^3 d^2} \\
&= -\frac{28125AB(bc - ad)^5 g^2 x}{2b^3 d^2} - \frac{9375B^2(bc - ad)^5 g^2 x}{b^3 d^2} - \frac{65625B^2(bc - ad)^5 g^2 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^3 d^2}
\end{aligned}$$

**Mathematica [A]** time = 1.34451, size = 1555, normalized size = 1.71

result too large to display

Antiderivative was successfully verified.

[In] Integrate[(a\*g + b\*g\*x)^2\*(c\*i + d\*i\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2,x]

[Out] (g^2\*i^3\*(15\*(b\*c - a\*d)^2\*(c + d\*x)^4\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2 - 24\*b\*(b\*c - a\*d)\*(c + d\*x)^5\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2 + 10\*b^2\*(c + d\*x)^6\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2 - (5\*B\*(b\*c - a\*d)^3\*(6\*A\*b\*d\*(b\*c - a\*d)^2\*x - 3\*B\*(b\*c - a\*d)^2\*(b\*d\*x + (b\*c - a\*d)\*Log[a + b\*x]) - B\*(b\*c - a\*d)\*(2\*b\*d\*(b\*c - a\*d)\*x + b^2\*(c + d\*x)^2 + 2\*(b\*c - a\*d)^2\*Log[a + b\*x]) + 6\*B\*d\*(b\*c - a\*d)^2\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x)] + 3\*b^2\*(b\*c - a\*d)\*(c + d\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) + 2\*b^3\*(c + d\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) + 6\*(b\*c - a\*d)^3\*Log[a + b\*x]\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) - 6\*B\*(b\*c - a\*d)^3\*Log[c + d\*x] - 3\*B\*(b\*c - a\*d)^3\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]) - 2\*PolyLog[2, (d\*(a + b\*x))/(-(b\*c) + a\*d)]))/b^4 + (2\*B\*(b\*c - a\*d)^2\*(24\*A\*b\*d\*(b\*c - a\*d)^3\*x - 12\*B\*(b\*c - a\*d)^3\*(b\*d\*x + (b\*c - a\*d)\*Log[a + b\*x]) - 4\*B\*(b\*c - a\*d)^2\*(2\*b\*d\*(b\*c - a\*d)\*x + b^2\*(c + d\*x)^2 + 2\*(b\*c - a\*d)^2\*Log[a + b\*x]) - B\*(b\*c - a\*d)\*(6\*b\*d\*(b\*c - a\*d)^2\*x + 3\*b^2\*(b\*c - a\*d)\*(c + d\*x)^2 + 2\*b^3\*(c + d\*x)^3 + 6\*(b\*c - a\*d)^3\*Log[a + b\*x]) + 24\*B\*d\*(b\*c - a\*d)^3\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x)] + 12\*b^2\*(b\*c - a\*d)^2\*(c + d\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) + 8\*b^3\*(b\*c - a\*d)\*(c + d\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) + 6\*b^4\*(c + d\*x)^4\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) + 24\*(b\*c - a\*d)^4\*Log[a + b\*x]\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) - 24\*B\*(b\*c - a\*d)^4\*Log[c + d\*x] - 12\*B\*(b\*c - a\*d)^4\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]) - 2\*PolyLog[2, (d\*(a + b\*x))/(-(b\*c) + a\*d)]))/b^4 - (B\*(b\*c - a\*d)\*(120\*A\*b\*d\*(b\*c - a\*d)^4\*x - 60\*B\*(b\*c - a\*d)^4\*(b\*d\*x + (b\*c - a\*d)\*Log[a + b\*x]) - 20\*B\*(b\*c - a\*d)^3\*(2\*b\*d\*(b\*c - a\*d)\*x + b^2\*(c + d\*x)^2 + 2\*(b\*c - a\*d)^2\*Log[a + b\*x]) - 5\*B\*(b\*c - a\*d)^2\*(6\*b\*d\*(b\*c - a\*d)^2\*x + 3\*b^2\*(b\*c - a\*d)\*(c + d\*x)^2 + 2\*b^3\*(c + d\*x)^3 + 6\*(b\*c - a\*d)^3\*Log[a + b\*x]) - 2\*B\*(b\*c - a\*d)\*(12\*b\*d\*(b\*c - a\*d)^3\*x + 6\*b^2\*(b\*c - a\*d)^2\*(c + d\*x)^2 + 4\*b^3\*(b\*c - a\*d)\*(c + d\*x)^3 + 3\*b^4\*(c + d\*x)^4 + 12\*(b\*c - a\*d)^4\*Log[a + b\*x]) + 120\*B\*d\*(b\*c - a\*d)^4\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x)] + 60\*b^2\*(b\*c - a\*d)^3\*(c + d\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) + 40\*b^3\*(b\*c - a\*d)^2\*(c + d\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) + 30\*b^4\*(b\*c - a\*d)\*(c + d\*x)^4\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) + 24\*b^5\*(c + d\*x)^5\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) + 120\*(b\*c - a\*d)^5\*Log[a + b\*x]\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) - 120\*B\*(b\*c - a\*d)^5\*Log[c + d\*x] - 60\*B\*(b\*c - a\*d)^5\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))

))/(b\*c - a\*d))] - 2\*PolyLog[2, (d\*(a + b\*x))/(-(b\*c) + a\*d)])))/(6\*b^4)))/(60\*d^3)

**Maple [F]** time = 2.914, size = 0, normalized size = 0.

$$\int (bgx + ag)^2 (dix + ci)^3 \left( A + B \ln \left( \frac{e(bx + a)}{dx + c} \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)^3\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2,x)

[Out] int((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)^3\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2,x)

**Maxima [B]** time = 2.12201, size = 7015, normalized size = 7.73

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2,x, algorithm="maxima")

[Out] 1/6\*A^2\*b^2\*d^3\*g^2\*i^3\*x^6 + 3/5\*A^2\*b^2\*c\*d^2\*g^2\*i^3\*x^5 + 2/5\*A^2\*a\*b\*d^3\*g^2\*i^3\*x^5 + 3/4\*A^2\*b^2\*c^2\*d\*g^2\*i^3\*x^4 + 3/2\*A^2\*a\*b\*c\*d^2\*g^2\*i^3\*x^4 + 1/4\*A^2\*a^2\*d^3\*g^2\*i^3\*x^4 + 1/3\*A^2\*b^2\*c^3\*g^2\*i^3\*x^3 + 2\*A^2\*a\*b\*c^2\*d\*g^2\*i^3\*x^3 + A^2\*a^2\*c\*d^2\*g^2\*i^3\*x^3 + A^2\*a\*b\*c^3\*g^2\*i^3\*x^2 + 3/2\*A^2\*a^2\*c^2\*d\*g^2\*i^3\*x^2 + 2\*(x\*log(b\*e\*x/(d\*x + c) + a\*e/(d\*x + c)) + a\*log(b\*x + a)/b - c\*log(d\*x + c)/d)\*A\*B\*a^2\*c^3\*g^2\*i^3 + 2\*(x^2\*log(b\*e\*x/(d\*x + c) + a\*e/(d\*x + c)) - a^2\*log(b\*x + a)/b^2 + c^2\*log(d\*x + c)/d^2 - (b\*c - a\*d)\*x/(b\*d))\*A\*B\*a\*b\*c^3\*g^2\*i^3 + 1/3\*(2\*x^3\*log(b\*e\*x/(d\*x + c) + a\*e/(d\*x + c)) + 2\*a^3\*log(b\*x + a)/b^3 - 2\*c^3\*log(d\*x + c)/d^3 - ((b^2\*c\*d - a\*b\*d^2)\*x^2 - 2\*(b^2\*c^2 - a^2\*d^2)\*x)/(b^2\*d^2))\*A\*B\*b^2\*c^3\*g^2\*i^3 + 3\*(x^2\*log(b\*e\*x/(d\*x + c) + a\*e/(d\*x + c)) - a^2\*log(b\*x + a)/b^2 + c^2\*log(d\*x + c)/d^2 - (b\*c - a\*d)\*x/(b\*d))\*A\*B\*a^2\*c^2\*d\*g^2\*i^3 + 2\*(2\*x^3\*log(b\*e\*x/(d\*x + c) + a\*e/(d\*x + c)) + 2\*a^3\*log(b\*x + a)/b^3 - 2\*c^3\*log(d\*x + c)/d^3 - ((b^2\*c\*d - a\*b\*d^2)\*x^2 - 2\*(b^2\*c^2 - a^2\*d^2)\*x)/(b^2\*d^2))\*A\*B\*a\*b\*c^2\*d\*g^2\*i^3 + 1/4\*(6\*x^4\*log(b\*e\*x/(d\*x + c) + a\*e/(d\*x + c)) - 6\*a^4\*log(b\*x + a)/b^4 + 6\*c^4\*log(d\*x + c)/d^4 - (2\*(b^3\*c\*d^2 - a\*b^2\*d



$$\begin{aligned}
&^3)x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3 \\
&))*A*B*b^2*c^2*d*g^2*i^3 + (2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2* \\
&a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - \\
&2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a^2*c*d^2*g^2*i^3 + 1/2*(6*x^4*log( \\
&b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + \\
&c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + \\
&6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*a*b*c*d^2*g^2*i^3 + 1/10*(12*x^5*lo \\
&g(b*e*x/(d*x + c) + a*e/(d*x + c)) + 12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d \\
&x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4) \\
&)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4) \\
&))*A*B*b^2*c*d^2*g^2*i^3 + 1/12*(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) \\
&- 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d \\
&^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3 \\
&))*A*B*a^2*d^3*g^2*i^3 + 1/15*(12*x^5*log(b*e*x/(d*x + c) + a*e/(d*x + c)) \\
&+ 12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3 \\
&*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x \\
&^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*A*B*a*b*d^3*g^2*i^3 + 1/180*(60*x \\
&^6*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 60*a^6*log(b*x + a)/b^6 + 60*c^6* \\
&log(d*x + c)/d^6 - (12*(b^5*c*d^4 - a*b^4*d^5)*x^5 - 15*(b^5*c^2*d^3 - a^2* \\
&b^3*d^5)*x^4 + 20*(b^5*c^3*d^2 - a^3*b^2*d^5)*x^3 - 30*(b^5*c^4*d - a^4*b*d \\
&^5)*x^2 + 60*(b^5*c^5 - a^5*d^5)*x)/(b^5*d^5))*A*B*b^2*d^3*g^2*i^3 + A^2*a^ \\
&2*c^3*g^2*i^3*x - 1/180*(74*a^3*b^2*c^3*d^3*g^2*i^3 - 33*a^4*b*c^2*d^4*g^2* \\
&i^3 + 6*a^5*c*d^5*g^2*i^3 + 2*(3*g^2*i^3*log(e) - g^2*i^3)*b^5*c^6 - 18*(2* \\
&g^2*i^3*log(e) - g^2*i^3)*a*b^4*c^5*d + 9*(10*g^2*i^3*log(e) - 7*g^2*i^3)*a \\
&^2*b^3*c^4*d^2)*B^2*log(d*x + c)/(b^3*d^3) - 1/30*(b^6*c^6*g^2*i^3 - 6*a*b^ \\
&5*c^5*d*g^2*i^3 + 15*a^2*b^4*c^4*d^2*g^2*i^3 - 20*a^3*b^3*c^3*d^3*g^2*i^3 + \\
&15*a^4*b^2*c^2*d^4*g^2*i^3 - 6*a^5*b*c*d^5*g^2*i^3 + a^6*d^6*g^2*i^3)*(log \\
&(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - \\
&a*d)))*B^2/(b^4*d^3) + 1/360*(60*B^2*b^6*d^6*g^2*i^3*x^6*log(e)^2 + 24*((9* \\
&g^2*i^3*log(e))^2 - g^2*i^3*log(e))*b^6*c*d^5 + (6*g^2*i^3*log(e))^2 + g^2*i^ \\
&3*log(e))*a*b^5*d^6)*B^2*x^5 + 6*((45*g^2*i^3*log(e))^2 - 13*g^2*i^3*log(e) \\
&+ g^2*i^3)*b^6*c^2*d^4 + 2*(45*g^2*i^3*log(e))^2 + 3*g^2*i^3*log(e) - g^2*i^ \\
&3)*a*b^5*c*d^5 + (15*g^2*i^3*log(e))^2 + 7*g^2*i^3*log(e) + g^2*i^3)*a^2*b^4 \\
&*d^6)*B^2*x^4 + 2*((60*g^2*i^3*log(e))^2 - 38*g^2*i^3*log(e) + 9*g^2*i^3)*b^ \\
&6*c^3*d^3 + 3*(120*g^2*i^3*log(e))^2 - 14*g^2*i^3*log(e) - 5*g^2*i^3)*a*b^5* \\
&c^2*d^4 + 3*(60*g^2*i^3*log(e))^2 + 26*g^2*i^3*log(e) + g^2*i^3)*a^2*b^4*c*d \\
&^5 + (2*g^2*i^3*log(e) + 3*g^2*i^3)*a^3*b^3*d^6)*B^2*x^3 - ((6*g^2*i^3*log( \\
&e) - 11*g^2*i^3)*b^6*c^4*d^2 - 2*(180*g^2*i^3*log(e))^2 - 102*g^2*i^3*log(e) \\
&+ 5*g^2*i^3)*a*b^5*c^3*d^3 - 60*(9*g^2*i^3*log(e))^2 + 3*g^2*i^3*log(e) - g \\
&^2*i^3)*a^2*b^4*c^2*d^4 - 2*(18*g^2*i^3*log(e) + 23*g^2*i^3)*a^3*b^3*c*d^5 \\
&+ (6*g^2*i^3*log(e) + 7*g^2*i^3)*a^4*b^2*d^6)*B^2*x^2 + 2*(2*(3*g^2*i^3*log \\
&(e) - 4*g^2*i^3)*b^6*c^5*d - 3*(12*g^2*i^3*log(e) - 17*g^2*i^3)*a*b^5*c^4*d \\
&^2 + (180*g^2*i^3*log(e))^2 - 30*g^2*i^3*log(e) - 97*g^2*i^3)*a^2*b^4*c^3*d^ \\
&3 + (90*g^2*i^3*log(e) + 77*g^2*i^3)*a^3*b^3*c^2*d^4 - 9*(4*g^2*i^3*log(e) \\
&+ 3*g^2*i^3)*a^4*b^2*c*d^5 + 2*(3*g^2*i^3*log(e) + 2*g^2*i^3)*a^5*b*d^6)*B^
\end{aligned}$$

$$\begin{aligned}
& 2*x + 6*(10*B^2*b^6*d^6*g^2*i^3*x^6 + 60*B^2*a^2*b^4*c^3*d^3*g^2*i^3*x + 12 \\
& *(3*b^6*c^d^5*g^2*i^3 + 2*a*b^5*d^6*g^2*i^3)*B^2*x^5 + 15*(3*b^6*c^2*d^4*g^2 \\
& *i^3 + 6*a*b^5*c^d^5*g^2*i^3 + a^2*b^4*d^6*g^2*i^3)*B^2*x^4 + 20*(b^6*c^3*d^3 \\
& *g^2*i^3 + 6*a*b^5*c^2*d^4*g^2*i^3 + 3*a^2*b^4*c^d^5*g^2*i^3)*B^2*x^3 + \\
& 30*(2*a*b^5*c^3*d^3*g^2*i^3 + 3*a^2*b^4*c^2*d^4*g^2*i^3)*B^2*x^2 + (20*a^3*b^3 \\
& *c^3*d^3*g^2*i^3 - 15*a^4*b^2*c^2*d^4*g^2*i^3 + 6*a^5*b*c^d^5*g^2*i^3 - a^6*d^6 \\
& *g^2*i^3)*B^2)*\log(b*x + a)^2 + 6*(10*B^2*b^6*d^6*g^2*i^3*x^6 + 60*B^2*a^2 \\
& *b^4*c^3*d^3*g^2*i^3*x + 12*(3*b^6*c^d^5*g^2*i^3 + 2*a*b^5*d^6*g^2*i^3)*B^2*x^5 \\
& + 15*(3*b^6*c^2*d^4*g^2*i^3 + 6*a*b^5*c^d^5*g^2*i^3 + a^2*b^4*d^6*g^2*i^3)*B^2*x^4 \\
& + 20*(b^6*c^3*d^3*g^2*i^3 + 6*a*b^5*c^2*d^4*g^2*i^3 + 3*a^2*b^4*c^d^5*g^2*i^3)*B^2*x^3 \\
& + 30*(2*a*b^5*c^3*d^3*g^2*i^3 + 3*a^2*b^4*c^2*d^4*g^2*i^3)*B^2*x^2 + (b^6*c^6*g^2 \\
& *i^3 - 6*a*b^5*c^5*d*g^2*i^3 + 15*a^2*b^4*c^4*d^2*g^2*i^3)*B^2)*\log(d*x + c)^2 \\
& + 2*(60*B^2*b^6*d^6*g^2*i^3*x^6*\log(e) + 12*((18*g^2*i^3*\log(e) - g^2*i^3)*b^6 \\
& *c^d^5 + (12*g^2*i^3*\log(e) + g^2*i^3)*a*b^5*d^6)*B^2*x^5 + 3*((90*g^2*i^3*\log(e) \\
& - 13*g^2*i^3)*b^6*c^2*d^4 + 6*(30*g^2*i^3*\log(e) + g^2*i^3)*a*b^5*c^d^5 + (30*g^2 \\
& *i^3*\log(e) + 7*g^2*i^3)*a^2*b^4*d^6)*B^2*x^4 + 2*(a^3*b^3*d^6*g^2*i^3 + (60*g^2 \\
& *i^3*\log(e) - 19*g^2*i^3)*b^6*c^3*d^3 + 3*(120*g^2*i^3*\log(e) - 7*g^2*i^3)*a*b^5 \\
& *c^2*d^4 + 3*(60*g^2*i^3*\log(e) + 13*g^2*i^3)*a^2*b^4*c^d^5)*B^2*x^3 - 3*(b^6*c^4 \\
& *d^2*g^2*i^3 - 6*a^3*b^3*c^d^5*g^2*i^3 + a^4*b^2*d^6*g^2*i^3 - 2*(60*g^2*i^3*\log(e) \\
& - 17*g^2*i^3)*a*b^5*c^3*d^3 - 30*(6*g^2*i^3*\log(e) + g^2*i^3)*a^2*b^4*c^2*d^4)*B^2 \\
& *x^2 + 6*(b^6*c^5*d*g^2*i^3 - 6*a*b^5*c^4*d^2*g^2*i^3 + 15*a^3*b^3*c^2*d^4*g^2 \\
& *i^3 - 6*a^4*b^2*c^d^5*g^2*i^3 + a^5*b*d^6*g^2*i^3 + 5*(12*g^2*i^3*\log(e) - g^2*i^3) \\
& *a^2*b^4*c^3*d^3)*B^2*x + (6*a*b^5*c^5*d*g^2*i^3 - 33*a^2*b^4*c^4*d^2*g^2*i^3 + 2*(60 \\
& *g^2*i^3*\log(e) + 17*g^2*i^3)*a^3*b^3*c^3*d^3 - 3*(30*g^2*i^3*\log(e) + g^2*i^3) \\
& *a^4*b^2*c^2*d^4 + 6*(6*g^2*i^3*\log(e) - g^2*i^3)*a^5*b*c^d^5 - 2*(3*g^2*i^3*\log(e) \\
& - g^2*i^3)*a^6*d^6)*B^2)*\log(b*x + a) - 2*(60*B^2*b^6*d^6*g^2*i^3*x^6*\log(e) + 12 \\
& *((18*g^2*i^3*\log(e) - g^2*i^3)*b^6*c^d^5 + (12*g^2*i^3*\log(e) + g^2*i^3)*a*b^5*d^6) \\
& *B^2*x^5 + 3*((90*g^2*i^3*\log(e) - 13*g^2*i^3)*b^6*c^2*d^4 + 6*(30*g^2*i^3*\log(e) \\
& + g^2*i^3)*a*b^5*c^d^5 + (30*g^2*i^3*\log(e) + 7*g^2*i^3)*a^2*b^4*d^6)*B^2*x^4 + \\
& 2*(a^3*b^3*d^6*g^2*i^3 + (60*g^2*i^3*\log(e) - 19*g^2*i^3)*b^6*c^3*d^3 + 3*(120 \\
& *g^2*i^3*\log(e) - 7*g^2*i^3)*a*b^5*c^2*d^4 + 3*(60*g^2*i^3*\log(e) + 13*g^2 \\
& *i^3)*a^2*b^4*c^d^5)*B^2*x^3 - 3*(b^6*c^4*d^2*g^2*i^3 - 6*a^3*b^3*c^d^5*g^2*i^3 + a^4 \\
& *b^2*d^6*g^2*i^3 - 2*(60*g^2*i^3*\log(e) - 17*g^2*i^3)*a*b^5*c^3*d^3 - 30*(6*g^2 \\
& *i^3*\log(e) + g^2*i^3)*a^2*b^4*c^2*d^4)*B^2*x^2 + 6*(b^6*c^5*d*g^2*i^3 - 6*a*b^5 \\
& *c^4*d^2*g^2*i^3 + 15*a^3*b^3*c^2*d^4*g^2*i^3 - 6*a^4*b^2*c^d^5*g^2*i^3 + a^5*b*d^6 \\
& *g^2*i^3 + 5*(12*g^2*i^3*\log(e) - g^2*i^3)*a^2*b^4*c^3*d^3)*B^2*x + 6*(10*B^2*b^6 \\
& *d^6*g^2*i^3*x^6 + 60*B^2*a^2*b^4*c^3*d^3*g^2*i^3*x + 12*(3*b^6*c^d^5*g^2*i^3 + 2*a \\
& *b^5*d^6*g^2*i^3)*B^2*x^5 + 15*(3*b^6*c^2*d^4*g^2*i^3 + 6*a*b^5*c^d^5*g^2*i^3 + a^2 \\
& *b^4*d^6*g^2*i^3)*B^2*x^4 + 20*(b^6*c^3*d^3*g^2*i^3 + 6*a*b^5*c^2*d^4*g^2*i^3 + 3*a^2 \\
& *b^4*c^d^5*g^2*i^3)*B^2*x^3 + 30*(2*a*b^5*c^3*d^3*g^2*i^3 + 3*a^2*b^4*c^2*d^4*g^2 \\
& *i^3)*B^2*x^2 + (20*a^3*b^3*c^3*d^3*g^2*i^3 - 15*a^4*b^2*c^2*d^4*g^2*i^3 + 6*a^5*b \\
& *c^d^5*g^2*i^3 - a^6*d^6*g^2*i^3)*B^2)*\log(b*x + a))*\log(d*x + c))/(b^4*d^3
\end{aligned}$$

)

**Fricas [F]** time = 0., size = 0, normalized size = 0.

integral  $\left( A^2 b^2 d^3 g^2 i^3 x^5 + A^2 a^2 c^3 g^2 i^3 + (3 A^2 b^2 c d^2 + 2 A^2 a b d^3) g^2 i^3 x^4 + (3 A^2 b^2 c^2 d + 6 A^2 a b c d^2 + A^2 a^2 d^3) g^2 i^3 x^3 + (A^2 b^2 c^2 d^2 + 6 A^2 a b c^2 d + 3 A^2 a^2 c d^2) g^2 i^3 x^2 + (2 A^2 a b c^2 d + 3 A^2 a^2 c^2 d) g^2 i^3 x + (B^2 b^2 d^3 g^2 i^3 x^5 + B^2 a^2 c^3 g^2 i^3 + (3 B^2 b^2 c d^2 + 2 B^2 a b d^3) g^2 i^3 x^4 + (3 B^2 b^2 c^2 d + 6 B^2 a b c^2 d + B^2 a^2 d^3) g^2 i^3 x^3 + (B^2 b^2 c^2 d + 6 B^2 a b c^2 d + 3 B^2 a^2 c d^2) g^2 i^3 x^2 + (2 B^2 a b c^2 d + 3 B^2 a^2 c^2 d) g^2 i^3 x * \log((b * e * x + a * e) / (d * x + c)) \right)^2, x$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2,x, algorithm="fricas")

[Out] integral(A^2\*b^2\*d^3\*g^2\*i^3\*x^5 + A^2\*a^2\*c^3\*g^2\*i^3 + (3\*A^2\*b^2\*c\*d^2 + 2\*A^2\*a\*b\*d^3)\*g^2\*i^3\*x^4 + (3\*A^2\*b^2\*c^2\*d + 6\*A^2\*a\*b\*c\*d^2 + A^2\*a^2\*d^3)\*g^2\*i^3\*x^3 + (A^2\*b^2\*c^3 + 6\*A^2\*a\*b\*c^2\*d + 3\*A^2\*a^2\*c\*d^2)\*g^2\*i^3\*x^2 + (2\*A^2\*a\*b\*c^3 + 3\*A^2\*a^2\*c^2\*d)\*g^2\*i^3\*x + (B^2\*b^2\*d^3\*g^2\*i^3\*x^5 + B^2\*a^2\*c^3\*g^2\*i^3 + (3\*B^2\*b^2\*c\*d^2 + 2\*B^2\*a\*b\*d^3)\*g^2\*i^3\*x^4 + (3\*B^2\*b^2\*c^2\*d + 6\*B^2\*a\*b\*c\*d^2 + B^2\*a^2\*d^3)\*g^2\*i^3\*x^3 + (B^2\*b^2\*c^2\*d + 6\*B^2\*a\*b\*c^2\*d + 3\*B^2\*a^2\*c\*d^2)\*g^2\*i^3\*x^2 + (2\*B^2\*a\*b\*c^3 + 3\*B^2\*a^2\*c^2\*d)\*g^2\*i^3\*x)\*log((b\*e\*x + a\*e)/(d\*x + c))^2 + 2\*(A\*B\*b^2\*d^3\*g^2\*i^3\*x^5 + A\*B\*a^2\*c^3\*g^2\*i^3 + (3\*A\*B\*b^2\*c\*d^2 + 2\*A\*B\*a\*b\*d^3)\*g^2\*i^3\*x^4 + (3\*A\*B\*b^2\*c^2\*d + 6\*A\*B\*a\*b\*c\*d^2 + A\*B\*a^2\*d^3)\*g^2\*i^3\*x^3 + (A\*B\*b^2\*c^3 + 6\*A\*B\*a\*b\*c^2\*d + 3\*A\*B\*a^2\*c\*d^2)\*g^2\*i^3\*x^2 + (2\*A\*B\*a\*b\*c^3 + 3\*A\*B\*a^2\*c^2\*d)\*g^2\*i^3\*x)\*log((b\*e\*x + a\*e)/(d\*x + c)), x

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*\*2\*(d\*i\*x+c\*i)\*\*3\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))\*\*2,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int (bgx + ag)^2 (dix + ci)^3 \left( B \log\left(\frac{(bx + a)e}{dx + c}\right) + A \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(d*i*x + c*i)^3*(B*log((b*x + a)*e/(d*x + c)) + A)^2, x)
```

$$3.76 \quad \int (ag + bgx)(ci + dix)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx$$

**Optimal.** Leaf size=730

$$\frac{B^2 g i^3 (bc - ad)^5 \text{PolyLog} \left( 2, \frac{d(a+bx)}{b(c+dx)} \right)}{10b^4 d^2} - \frac{B g i^3 (bc - ad)^5 \log \left( \frac{bc-ad}{b(c+dx)} \right) \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A + B \right)}{10b^4 d^2} + \frac{3B g i^3 (c + dx)^2 (bc - ad)}{20b^2 d^2}$$

[Out]  $(B^2*(b*c - a*d)^4*g*i^3*x)/(60*b^3*d) + (B^2*(b*c - a*d)^3*g*i^3*(c + d*x)^2)/(30*b^2*d^2) + (B^2*(b*c - a*d)^2*g*i^3*(c + d*x)^3)/(30*b*d^2) - (B^2*(b*c - a*d)^5*g*i^3*\text{Log}[(a + b*x)/(c + d*x)])/(12*b^4*d^2) - (B*(b*c - a*d)^4*g*i^3*(a + b*x)*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x]]))/(10*b^4*d) - (B*(b*c - a*d)^3*g*i^3*(a + b*x)^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x]]))/(10*b^4) + (3*B*(b*c - a*d)^3*g*i^3*(c + d*x)^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x]]))/(20*b^2*d^2) + (B*(b*c - a*d)^2*g*i^3*(c + d*x)^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x]]))/(30*b*d^2) - (B*(b*c - a*d)*g*i^3*(c + d*x)^4*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x]]))/(10*d^2) + ((b*c - a*d)^3*g*i^3*(a + b*x)^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x]]^2)/(20*b^4) + ((b*c - a*d)^2*g*i^3*(a + b*x)^2*(c + d*x)*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x]]^2)/(10*b^3) + (3*(b*c - a*d)*g*i^3*(a + b*x)^2*(c + d*x)^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x]]^2)/(20*b^2) + (g*i^3*(a + b*x)^2*(c + d*x)^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x]]^2)/(5*b) - (B*(b*c - a*d)^5*g*i^3*\text{Log}[(b*c - a*d)/(b*(c + d*x))]*(A + B + B*\text{Log}[(e*(a + b*x))/(c + d*x]]))/(10*b^4*d^2) - (11*B^2*(b*c - a*d)^5*g*i^3*\text{Log}[c + d*x]/(60*b^4*d^2) - (B^2*(b*c - a*d)^5*g*i^3*\text{PolyLog}[2, (d*(a + b*x))/(b*(c + d*x))])/(10*b^4*d^2)$

**Rubi [A]** time = 1.7813, antiderivative size = 655, normalized size of antiderivative = 0.9, number of steps used = 54, number of rules used = 13, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.325$ , Rules used = {2528, 2525, 12, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 43}

$$\frac{B^2 g i^3 (bc - ad)^5 \text{PolyLog} \left( 2, -\frac{d(a+bx)}{bc-ad} \right)}{10b^4 d^2} + \frac{B g i^3 (bc - ad)^5 \log(a + bx) \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{10b^4 d^2} + \frac{B g i^3 (c + dx)^2 (bc - ad)^3 (B \log \left( \frac{e(a+bx)}{c+dx} \right) + A)}{20b^2 d^2}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[(a*g + b*g*x)*(c*i + d*i*x)^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x]]^2, x]$

[Out]  $(A*B*(b*c - a*d)^4*g*i^3*x)/(10*b^3*d) + (B^2*(b*c - a*d)^4*g*i^3*x)/(60*b^3*d) + (B^2*(b*c - a*d)^3*g*i^3*(c + d*x)^2)/(30*b^2*d^2) + (B^2*(b*c - a*d)^2*g*i^3*(c + d*x)^3)/(30*b*d^2) + (B^2*(b*c - a*d)^5*g*i^3*\text{Log}[a + b*x])/$

$$(60*b^4*d^2) - (B^2*(b*c - a*d)^5*g*i^3*Log[a + b*x]^2)/(20*b^4*d^2) + (B^2*(b*c - a*d)^4*g*i^3*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)]/(10*b^4*d) + (B*(b*c - a*d)^3*g*i^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(20*b^2*d^2) + (B*(b*c - a*d)^2*g*i^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(30*b*d^2) - (B*(b*c - a*d)*g*i^3*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(10*d^2) + (B*(b*c - a*d)^5*g*i^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(10*b^4*d^2) - ((b*c - a*d)*g*i^3*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]^2)/(4*d^2) + (b*g*i^3*(c + d*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]^2)/(5*d^2) - (B^2*(b*c - a*d)^5*g*i^3*Log[c + d*x]/(10*b^4*d^2) + (B^2*(b*c - a*d)^5*g*i^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)]/(10*b^4*d^2) + (B^2*(b*c - a*d)^5*g*i^3*PolyLog[2, -(d*(a + b*x))/(b*c - a*d)]/(10*b^4*d^2)$$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.)]^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s - 1/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

### Rule 31

```
Int[((a_) + (b_.)*(x_))^(n_), x_Symbol] := Simp[Log[RemoveContent[a + b*x,
```

x]]/b, x] /; FreeQ[{a, b}, x]

#### Rule 2524

Int[((a\_.) + Log[(c\_.)\*(Rfx\_)^(p\_.)]\*(b\_.))^(n\_.)/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] :> Simp[(Log[d + e\*x]\*(a + b\*Log[c\*Rfx^p])^n)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[d + e\*x]\*(a + b\*Log[c\*Rfx^p])^(n - 1)\*D[Rfx, x])/Rfx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]

#### Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*(Rfx\_), x\_Symbol] :> With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n])^p, Rfx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[Rfx, x] && IntegerQ[p]

#### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.)\*(x\_))^(q\_.), x\_Symbol] :> Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

#### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] :> Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

#### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :> Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

#### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :> Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

#### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rule 43

```
Int[((a_.) + (b_.)*(x_)^(m_.))*((c_.) + (d_.)*(x_)^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && LeQ[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

### Rubi steps



$$\begin{aligned}
\int (76c + 76dx)^3(ag + bgx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx &= \int \left( \frac{(-bc + ad)g(76c + 76dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d} + \frac{bg(76c + 76dx)^3}{d} \right) dx \\
&= \frac{(bg) \int (76c + 76dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{76d} + \frac{(-bc + ad)g \int (76c + 76dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{76d} \\
&= -\frac{109744(bc - ad)g(c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d^2} + \frac{438976g(c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d^2} \\
&= -\frac{109744(bc - ad)g(c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d^2} + \frac{438976g(c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d^2} \\
&= -\frac{109744(bc - ad)g(c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d^2} + \frac{438976g(c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d^2} \\
&= -\frac{109744(bc - ad)g(c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d^2} + \frac{438976g(c + dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d^2} \\
&= \frac{219488AB(bc - ad)^4gx}{5b^3d} + \frac{109744B(bc - ad)^3g(c + dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{5b^2d^2} \\
&= \frac{219488AB(bc - ad)^4gx}{5b^3d} + \frac{219488B^2(bc - ad)^4g(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{5b^4d} \\
&= \frac{219488AB(bc - ad)^4gx}{5b^3d} + \frac{219488B^2(bc - ad)^4g(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{5b^4d} \\
&= \frac{219488AB(bc - ad)^4gx}{5b^3d} + \frac{109744B^2(bc - ad)^4gx}{15b^3d} + \frac{219488B^2(bc - ad)^4g(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{15b^3d} \\
&= \frac{219488AB(bc - ad)^4gx}{5b^3d} + \frac{109744B^2(bc - ad)^4gx}{15b^3d} + \frac{219488B^2(bc - ad)^4g(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{15b^3d} \\
&= \frac{219488AB(bc - ad)^4gx}{5b^3d} + \frac{109744B^2(bc - ad)^4gx}{15b^3d} + \frac{219488B^2(bc - ad)^4g(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{15b^3d} \\
&= \frac{219488AB(bc - ad)^4gx}{5b^3d} + \frac{109744B^2(bc - ad)^4gx}{15b^3d} + \frac{219488B^2(bc - ad)^4g(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{15b^3d}
\end{aligned}$$

**Mathematica [A]** time = 0.705887, size = 901, normalized size = 1.23

$$g^3 \left( 4b \left( A + B \log \left( \frac{e^{(a+bx)}}{c+dx} \right) \right)^2 (c+dx)^5 - 5(bc-ad) \left( A + B \log \left( \frac{e^{(a+bx)}}{c+dx} \right) \right)^2 (c+dx)^4 + \frac{5B(bc-ad)^2 \left( 6 \log(a+bx) \left( A + B \log \left( \frac{e^{(a+bx)}}{c+dx} \right) \right) \right) (b)}{1} \right)$$

Antiderivative was successfully verified.

[In] Integrate[(a\*g + b\*g\*x)\*(c+i + d\*i\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])^2,x]

[Out] (g\*i^3\*(-5\*(b\*c - a\*d)\*(c + d\*x)^4\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])^2 + 4\*b\*(c + d\*x)^5\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])^2 + (5\*B\*(b\*c - a\*d)^2\*(6\*A\*b\*d\*(b\*c - a\*d)^2\*x - 3\*B\*(b\*c - a\*d)^2\*(b\*d\*x + (b\*c - a\*d)\*Log[a + b\*x]) - B\*(b\*c - a\*d)\*(2\*b\*d\*(b\*c - a\*d)\*x + b^2\*(c + d\*x)^2 + 2\*(b\*c - a\*d)^2\*Log[a + b\*x]) + 6\*B\*d\*(b\*c - a\*d)^2\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x]) + 3\*b^2\*(b\*c - a\*d)\*(c + d\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]) + 2\*b^3\*(c + d\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]) + 6\*(b\*c - a\*d)^3\*Log[a + b\*x]\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]) - 6\*B\*(b\*c - a\*d)^3\*Log[c + d\*x] - 3\*B\*(b\*c - a\*d)^3\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d])) - 2\*PolyLog[2, (d\*(a + b\*x))/(-(b\*c) + a\*d)])))/(3\*b^4) - (B\*(b\*c - a\*d)\*(24\*A\*b\*d\*(b\*c - a\*d)^3\*x - 12\*B\*(b\*c - a\*d)^3\*(b\*d\*x + (b\*c - a\*d)\*Log[a + b\*x]) - 4\*B\*(b\*c - a\*d)^2\*(2\*b\*d\*(b\*c - a\*d)\*x + b^2\*(c + d\*x)^2 + 2\*(b\*c - a\*d)^2\*Log[a + b\*x]) - B\*(b\*c - a\*d)\*(6\*b\*d\*(b\*c - a\*d)^2\*x + 3\*b^2\*(b\*c - a\*d)\*(c + d\*x)^2 + 2\*b^3\*(c + d\*x)^3 + 6\*(b\*c - a\*d)^3\*Log[a + b\*x]) + 24\*B\*d\*(b\*c - a\*d)^3\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x]) + 12\*b^2\*(b\*c - a\*d)^2\*(c + d\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]) + 8\*b^3\*(b\*c - a\*d)\*(c + d\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]) + 6\*b^4\*(c + d\*x)^4\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]) + 24\*(b\*c - a\*d)^4\*Log[a + b\*x]\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]) - 24\*B\*(b\*c - a\*d)^4\*Log[c + d\*x] - 12\*B\*(b\*c - a\*d)^4\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d])) - 2\*PolyLog[2, (d\*(a + b\*x))/(-(b\*c) + a\*d)])))/(3\*b^4)))/(20\*d^2)

**Maple [F]** time = 2.556, size = 0, normalized size = 0.

$$\int (bgx + ag)(dix + ci)^3 \left( A + B \ln \left( \frac{e^{(bx+a)}}{dx+c} \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)^3\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2,x)

```
[Out] int((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

---

**Maxima [B]** time = 2.00911, size = 4344, normalized size = 5.95

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algor
ithm="maxima")
```

```
[Out] 1/5*A^2*b*d^3*g*i^3*x^5 + 3/4*A^2*b*c*d^2*g*i^3*x^4 + 1/4*A^2*a*d^3*g*i^3*x
^4 + A^2*b*c^2*d*g*i^3*x^3 + A^2*a*c*d^2*g*i^3*x^3 + 1/2*A^2*b*c^3*g*i^3*x^
2 + 3/2*A^2*a*c^2*d*g*i^3*x^2 + 2*(x*log(b*e*x/(d*x + c) + a*e/(d*x + c)) +
a*log(b*x + a)/b - c*log(d*x + c)/d)*A*B*a*c^3*g*i^3 + (x^2*log(b*e*x/(d*x
+ c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c
- a*d)*x/(b*d))*A*B*b*c^3*g*i^3 + 3*(x^2*log(b*e*x/(d*x + c) + a*e/(d*x +
c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*
B*a*c^2*d*g*i^3 + (2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b
*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^
2 - a^2*d^2)*x)/(b^2*d^2))*A*B*b*c^2*d*g*i^3 + (2*x^3*log(b*e*x/(d*x + c) +
a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c
*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a*c*d^2*g*i^3 +
1/4*(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 +
6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a
^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*b*c*d^2*g*i^3 + 1/1
2*(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*
c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*
b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*a*d^3*g*i^3 + 1/30*(12
*x^5*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 12*a^5*log(b*x + a)/b^5 - 12*c^
5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*
b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b
^4*d^4))*A*B*b*d^3*g*i^3 + A^2*a*c^3*g*i^3*x - 1/60*(47*a^2*b^2*c^3*d^2*g*i
^3 - 27*a^3*b*c^2*d^3*g*i^3 + 6*a^4*c*d^4*g*i^3 - (6*g*i^3*log(e) - 5*g*i^3
)*b^4*c^5 + (30*g*i^3*log(e) - 31*g*i^3)*a*b^3*c^4*d)*B^2*log(d*x + c)/(b^3
*d^2) + 1/10*(b^5*c^5*g*i^3 - 5*a*b^4*c^4*d*g*i^3 + 10*a^2*b^3*c^3*d^2*g*i^
3 - 10*a^3*b^2*c^2*d^3*g*i^3 + 5*a^4*b*c*d^4*g*i^3 - a^5*d^5*g*i^3)*(log(b*
x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d
)))*B^2/(b^4*d^2) + 1/60*(12*B^2*b^5*d^5*g*i^3*x^5*log(e)^2 + 3*((15*g*i^3*
log(e)^2 - 2*g*i^3*log(e))*b^5*c*d^4 + (5*g*i^3*log(e)^2 + 2*g*i^3*log(e))*
a*b^4*d^5)*B^2*x^4 + 2*((30*g*i^3*log(e)^2 - 11*g*i^3*log(e) + g*i^3)*b^5*c
^2*d^3 + 2*(15*g*i^3*log(e)^2 + 5*g*i^3*log(e) - g*i^3)*a*b^4*c*d^4 + (g*i^
```

$$\begin{aligned}
& 3*\log(e) + g*i^3)*a^2*b^3*d^5)*B^2*x^3 + ((30*g*i^3*\log(e)^2 - 27*g*i^3*\log \\
& (e) + 8*g*i^3)*b^5*c^3*d^2 + 3*(30*g*i^3*\log(e)^2 + 5*g*i^3*\log(e) - 6*g*i^3 \\
& 3)*a*b^4*c^2*d^3 + 3*(5*g*i^3*\log(e) + 4*g*i^3)*a^2*b^3*c*d^4 - (3*g*i^3*\log \\
& (e) + 2*g*i^3)*a^3*b^2*d^5)*B^2*x^2 - ((6*g*i^3*\log(e) - 11*g*i^3)*b^5*c^4 \\
& *d - 2*(30*g*i^3*\log(e)^2 - 15*g*i^3*\log(e) - 14*g*i^3)*a*b^4*c^3*d^2 - 12* \\
& (5*g*i^3*\log(e) + 2*g*i^3)*a^2*b^3*c^2*d^3 + 2*(15*g*i^3*\log(e) + 4*g*i^3)* \\
& a^3*b^2*c*d^4 - (6*g*i^3*\log(e) + g*i^3)*a^4*b*d^5)*B^2*x + 3*(4*B^2*b^5*d^ \\
& 5*g*i^3*x^5 + 20*B^2*a*b^4*c^3*d^2*g*i^3*x + 5*(3*b^5*c*d^4*g*i^3 + a*b^4*d \\
& ^5*g*i^3)*B^2*x^4 + 20*(b^5*c^2*d^3*g*i^3 + a*b^4*c*d^4*g*i^3)*B^2*x^3 + 10 \\
& *(b^5*c^3*d^2*g*i^3 + 3*a*b^4*c^2*d^3*g*i^3)*B^2*x^2 + (10*a^2*b^3*c^3*d^2* \\
& g*i^3 - 10*a^3*b^2*c^2*d^3*g*i^3 + 5*a^4*b*c*d^4*g*i^3 - a^5*d^5*g*i^3)*B^2 \\
& )*\log(b*x + a)^2 + 3*(4*B^2*b^5*d^5*g*i^3*x^5 + 20*B^2*a*b^4*c^3*d^2*g*i^3* \\
& x + 5*(3*b^5*c*d^4*g*i^3 + a*b^4*d^5*g*i^3)*B^2*x^4 + 20*(b^5*c^2*d^3*g*i^3 \\
& + a*b^4*c*d^4*g*i^3)*B^2*x^3 + 10*(b^5*c^3*d^2*g*i^3 + 3*a*b^4*c^2*d^3*g*i \\
& ^3)*B^2*x^2 - (b^5*c^5*g*i^3 - 5*a*b^4*c^4*d*g*i^3)*B^2)*\log(d*x + c)^2 + ( \\
& 24*B^2*b^5*d^5*g*i^3*x^5*\log(e) + 6*((15*g*i^3*\log(e) - g*i^3)*b^5*c*d^4 + \\
& (5*g*i^3*\log(e) + g*i^3)*a*b^4*d^5)*B^2*x^4 + 2*(a^2*b^3*d^5*g*i^3 + (60*g* \\
& i^3*\log(e) - 11*g*i^3)*b^5*c^2*d^3 + 10*(6*g*i^3*\log(e) + g*i^3)*a*b^4*c*d^ \\
& 4)*B^2*x^3 + 3*(5*a^2*b^3*c*d^4*g*i^3 - a^3*b^2*d^5*g*i^3 + (20*g*i^3*\log(e) \\
& ) - 9*g*i^3)*b^5*c^3*d^2 + 5*(12*g*i^3*\log(e) + g*i^3)*a*b^4*c^2*d^3)*B^2*x \\
& ^2 - 6*(b^5*c^4*d*g*i^3 - 10*a^2*b^3*c^2*d^3*g*i^3 + 5*a^3*b^2*c*d^4*g*i^3 \\
& - a^4*b*d^5*g*i^3 - 5*(4*g*i^3*\log(e) - g*i^3)*a*b^4*c^3*d^2)*B^2*x - (6*a* \\
& b^4*c^4*d*g*i^3 - 3*(20*g*i^3*\log(e) - g*i^3)*a^2*b^3*c^3*d^2 + (60*g*i^3*\log \\
& (e) - 23*g*i^3)*a^3*b^2*c^2*d^3 - (30*g*i^3*\log(e) - 19*g*i^3)*a^4*b*c*d^ \\
& 4 + (6*g*i^3*\log(e) - 5*g*i^3)*a^5*d^5)*B^2)*\log(b*x + a) - (24*B^2*b^5*d^5 \\
& *g*i^3*x^5*\log(e) + 6*((15*g*i^3*\log(e) - g*i^3)*b^5*c*d^4 + (5*g*i^3*\log(e) \\
& ) + g*i^3)*a*b^4*d^5)*B^2*x^4 + 2*(a^2*b^3*d^5*g*i^3 + (60*g*i^3*\log(e) - 1 \\
& 1*g*i^3)*b^5*c^2*d^3 + 10*(6*g*i^3*\log(e) + g*i^3)*a*b^4*c*d^4)*B^2*x^3 + 3 \\
& *(5*a^2*b^3*c*d^4*g*i^3 - a^3*b^2*d^5*g*i^3 + (20*g*i^3*\log(e) - 9*g*i^3)*b \\
& ^5*c^3*d^2 + 5*(12*g*i^3*\log(e) + g*i^3)*a*b^4*c^2*d^3)*B^2*x^2 - 6*(b^5*c^ \\
& 4*d*g*i^3 - 10*a^2*b^3*c^2*d^3*g*i^3 + 5*a^3*b^2*c*d^4*g*i^3 - a^4*b*d^5*g* \\
& i^3 - 5*(4*g*i^3*\log(e) - g*i^3)*a*b^4*c^3*d^2)*B^2*x + 6*(4*B^2*b^5*d^5*g* \\
& i^3*x^5 + 20*B^2*a*b^4*c^3*d^2*g*i^3*x + 5*(3*b^5*c*d^4*g*i^3 + a*b^4*d^5*g \\
& *i^3)*B^2*x^4 + 20*(b^5*c^2*d^3*g*i^3 + a*b^4*c*d^4*g*i^3)*B^2*x^3 + 10*(b^ \\
& 5*c^3*d^2*g*i^3 + 3*a*b^4*c^2*d^3*g*i^3)*B^2*x^2 + (10*a^2*b^3*c^3*d^2*g*i^ \\
& 3 - 10*a^3*b^2*c^2*d^3*g*i^3 + 5*a^4*b*c*d^4*g*i^3 - a^5*d^5*g*i^3)*B^2)*\log \\
& (b*x + a))*\log(d*x + c))/(b^4*d^2)
\end{aligned}$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

integral  $\left( A^2 b d^3 g i^3 x^4 + A^2 a c^3 g i^3 + (3 A^2 b c d^2 + A^2 a d^3) g i^3 x^3 + 3 (A^2 b c^2 d + A^2 a c d^2) g i^3 x^2 + (A^2 b c^3 + 3 A^2 a c^2 d) g i^3 x + \right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas")
```

```
[Out] integral(A^2*b*d^3*g*i^3*x^4 + A^2*a*c^3*g*i^3 + (3*A^2*b*c*d^2 + A^2*a*d^3)*g*i^3*x^3 + 3*(A^2*b*c^2*d + A^2*a*c*d^2)*g*i^3*x^2 + (A^2*b*c^3 + 3*A^2*a*c^2*d)*g*i^3*x + (B^2*b*d^3*g*i^3*x^4 + B^2*a*c^3*g*i^3 + (3*B^2*b*c*d^2 + B^2*a*d^3)*g*i^3*x^3 + 3*(B^2*b*c^2*d + B^2*a*c*d^2)*g*i^3*x^2 + (B^2*b*c^3 + 3*B^2*a*c^2*d)*g*i^3*x)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*b*d^3*g*i^3*x^4 + A*B*a*c^3*g*i^3 + (3*A*B*b*c*d^2 + A*B*a*d^3)*g*i^3*x^3 + 3*(A*B*b*c^2*d + A*B*a*c*d^2)*g*i^3*x^2 + (A*B*b*c^3 + 3*A*B*a*c^2*d)*g*i^3*x)*log((b*e*x + a*e)/(d*x + c)), x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int (bgx + ag)(dix + ci)^3 \left( B \log \left( \frac{(bx + a)e}{dx + c} \right) + A \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(d*i*x + c*i)^3*(B*log((b*x + a)*e/(d*x + c)) + A)^2, x)
```

$$3.77 \quad \int (ci + dix)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx$$

**Optimal.** Leaf size=420

$$-\frac{B^2 i^3 (bc - ad)^4 \text{PolyLog} \left( 2, \frac{b(c+dx)}{d(a+bx)} \right)}{2b^4 d} + \frac{Bi^3 (bc - ad)^4 \log \left( 1 - \frac{b(c+dx)}{d(a+bx)} \right) \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{2b^4 d} - \frac{Bi^3 (a + bx)(bc - ad)^3 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{2b^4}$$

[Out] (5\*B^2\*(b\*c - a\*d)^3\*i^3\*x)/(12\*b^3) + (B^2\*(b\*c - a\*d)^2\*i^3\*(c + d\*x)^2)/(12\*b^2\*d) + (5\*B^2\*(b\*c - a\*d)^4\*i^3\*Log[(a + b\*x)/(c + d\*x)]/(12\*b^4\*d) - (B\*(b\*c - a\*d)^3\*i^3\*(a + b\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))/(2\*b^4) - (B\*(b\*c - a\*d)^2\*i^3\*(c + d\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))/(4\*b^2\*d) - (B\*(b\*c - a\*d)\*i^3\*(c + d\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))/(6\*b\*d) + (i^3\*(c + d\*x)^4\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))^2/(4\*d) + (11\*B^2\*(b\*c - a\*d)^4\*i^3\*Log[c + d\*x]/(12\*b^4\*d) + (B\*(b\*c - a\*d)^4\*i^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))\*Log[1 - (b\*(c + d\*x))/(d\*(a + b\*x))])/(2\*b^4\*d) - (B^2\*(b\*c - a\*d)^4\*i^3\*PolyLog[2, (b\*(c + d\*x))/(d\*(a + b\*x))])/(2\*b^4\*d)

**Rubi [A]** time = 0.616502, antiderivative size = 503, normalized size of antiderivative = 1.2, number of steps used = 24, number of rules used = 13, integrand size = 32,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.406$ , Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 43}

$$-\frac{B^2 i^3 (bc - ad)^4 \text{PolyLog} \left( 2, -\frac{d(a+bx)}{bc-ad} \right)}{2b^4 d} - \frac{Bi^3 (bc - ad)^4 \log(a + bx) \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{2b^4 d} - \frac{Bi^3 (c + dx)^2 (bc - ad)^2 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{4b^2 d}$$

Antiderivative was successfully verified.

[In] Int[(c\*i + d\*i\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]])^2,x]

[Out] -(A\*B\*(b\*c - a\*d)^3\*i^3\*x)/(2\*b^3) + (5\*B^2\*(b\*c - a\*d)^3\*i^3\*x)/(12\*b^3) + (B^2\*(b\*c - a\*d)^2\*i^3\*(c + d\*x)^2)/(12\*b^2\*d) + (5\*B^2\*(b\*c - a\*d)^4\*i^3\*Log[a + b\*x]/(12\*b^4\*d) + (B^2\*(b\*c - a\*d)^4\*i^3\*Log[a + b\*x]^2)/(4\*b^4\*d) - (B^2\*(b\*c - a\*d)^3\*i^3\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x)]/(2\*b^4) - (B\*(b\*c - a\*d)^2\*i^3\*(c + d\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))/(4\*b^2\*d) - (B\*(b\*c - a\*d)\*i^3\*(c + d\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))/(6\*b\*d) - (B\*(b\*c - a\*d)^4\*i^3\*Log[a + b\*x]\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))/(2\*b^4\*d) + (i^3\*(c + d\*x)^4\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))^2/(4\*d) + (B^2\*(b\*c - a\*d)^4\*i^3\*Log[c + d\*x]/(2\*b^4\*d) - (B^2\*(b\*c - a\*d)^2\*(b\*c - a\*d)^2\*i^3\*(c + d\*x)^2)/(12\*b^2\*d)

$$d)^{4i^3} \text{Log}[a + b*x] \text{Log}[(b*(c + d*x))/(b*c - a*d)] / (2*b^4*d) - (B^2*(b*c - a*d)^{4i^3} \text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]) / (2*b^4*d)$$

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_) /; FreeQ[b, x]]
```

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_.))^(p_.))*((c_.) + (d_.)*(x_.))^(q_.))^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s - 1)/(c + d*x), x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

### Rule 31

```
Int[((a_) + (b_.)*(x_.))^(n_.), x_Symbol] := Simp[Log[RemoveContent[a + b*x, x]]/b, x] /; FreeQ[{a, b}, x]
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_.)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol]
:> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)
)*(x_)^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)
^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_)^(m_.))*((c_.) + (d_.)*(x_)^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```



Rubi steps

$$\begin{aligned}
\int (77c + 77dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx &= \frac{456533(c+dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{4d} - \frac{B \int \frac{35153041(bc-ad)(c+dx)^3 (A+B \log \left( \frac{e(a+bx)}{c+dx} \right))^2}{a+bx} dx}{154d} \\
&= \frac{456533(c+dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{4d} - \frac{(456533B(bc-ad)) \int \frac{(c+dx)^3}{a+bx} dx}{2d} \\
&= \frac{456533(c+dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{4d} - \frac{(456533B(bc-ad)) \int \left( \frac{d(bc-a)}{a+bx} \right) dx}{2d} \\
&= \frac{456533(c+dx)^4 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{4d} - \frac{(456533B(bc-ad)) \int (c+dx) dx}{2b} \\
&= -\frac{456533AB(bc-ad)^3 x}{2b^3} - \frac{456533B(bc-ad)^2 (c+dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{4b^2 d} \\
&= -\frac{456533AB(bc-ad)^3 x}{2b^3} - \frac{456533B^2(bc-ad)^3 (a+bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{2b^4} \\
&= -\frac{456533AB(bc-ad)^3 x}{2b^3} - \frac{456533B^2(bc-ad)^3 (a+bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{2b^4} \\
&= -\frac{456533AB(bc-ad)^3 x}{2b^3} + \frac{2282665B^2(bc-ad)^3 x}{12b^3} + \frac{456533B^2(bc-ad)^3}{12b^2 d} \\
&= -\frac{456533AB(bc-ad)^3 x}{2b^3} + \frac{2282665B^2(bc-ad)^3 x}{12b^3} + \frac{456533B^2(bc-ad)^3}{12b^2 d} \\
&= -\frac{456533AB(bc-ad)^3 x}{2b^3} + \frac{2282665B^2(bc-ad)^3 x}{12b^3} + \frac{456533B^2(bc-ad)^3}{12b^2 d} \\
&= -\frac{456533AB(bc-ad)^3 x}{2b^3} + \frac{2282665B^2(bc-ad)^3 x}{12b^3} + \frac{456533B^2(bc-ad)^3}{12b^2 d}
\end{aligned}$$

**Mathematica [A]** time = 0.303566, size = 389, normalized size = 0.93

$$i^3 \left( (c+dx)^4 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)^2 - \frac{B(bc-ad) \left( -3B(bc-ad)^3 \left( \log(a+bx) \left( \log(a+bx) - 2 \log \left( \frac{b(c+dx)}{bc-ad} \right) \right) - 2 \text{PolyLog} \left( 2, \frac{d(a+bx)}{ad-bc} \right) \right) + 3b^2 (c+dx)^2 (bc-ad) \right)}{12b^2 d} \right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (i^3*((c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - (B*(b*c - a*d)*
6*A*b*d*(b*c - a*d)^2*x - 3*B*(b*c - a*d)^2*(b*d*x + (b*c - a*d)*Log[a + b*
x]) - B*(b*c - a*d)*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b*c - a*d)^
2*Log[a + b*x]) + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)
] + 3*b^2*(b*c - a*d)*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*
b^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 6*(b*c - a*d)^3*Log[
a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 6*B*(b*c - a*d)^3*Log[c + d
*x] - 3*B*(b*c - a*d)^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(
b*c - a*d)])) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/(3*b^4))/(4*d
)
```

**Maple [F]** time = 2.146, size = 0, normalized size = 0.

$$\int (dix + ci)^3 \left( A + B \ln \left( \frac{e^{(bx+a)}}{dx+c} \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

**Maxima [B]** time = 1.87103, size = 2415, normalized size = 5.75

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima
")
```

```
[Out] 1/4*A^2*d^3*i^3*x^4 + A^2*c*d^2*i^3*x^3 + 3/2*A^2*c^2*d*i^3*x^2 + 2*(x*log(
b*e*x/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)*A*B
*c^3*i^3 + 3*(x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b
^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*c^2*d*i^3 + (2*x^3*log
```

$$\begin{aligned}
& (bex/(dx + c) + ae/(dx + c)) + 2a^3 \log(bx + a)/b^3 - 2c^3 \log(dx + c)/d^3 - ((b^2cd - ab^2d^2)x^2 - 2(b^2c^2 - a^2d^2)x)/(b^2d^2)) * A \\
& * B^2cd^2i^3 + 1/12(6x^4 \log(bex/(dx + c) + ae/(dx + c)) - 6a^4 \log(bx + a)/b^4 + 6c^4 \log(dx + c)/d^4 - (2(b^3cd^2 - ab^2d^3)x^3 - 3 \\
& *(b^3c^2d - a^2bd^3)x^2 + 6(b^3c^3 - a^3d^3)x)/(b^3d^3)) * A * B^2d^3i^3 + A^2c^3i^3x - 1/12(26ab^2c^3d^2i^3 - 21a^2b^2c^2d^2i^3 + 6a^3c^2d^3i^3 + (6i^3 \log(e) - 11i^3) * b^3c^4) * B^2 \log(dx + c)/(b^3d) - \\
& 1/2(b^4c^4i^3 - 4ab^3c^3d^2i^3 + 6a^2b^2c^2d^2i^3 - 4a^3b^2c^2d^3i^3 + a^4d^4i^3) * (\log(bx + a) * \log((b^2dx + ad)/(bc - ad) + 1) + \log(-(b^2dx + ad)/(bc - ad))) * B^2/(b^4d) + 1/12(3B^2b^4d^4i^3x^4 * \log(e)^2 + 2(ab^3d^4i^3 \log(e) + (6i^3 \log(e)^2 - i^3 \log(e)) * b^4cd^3) * B^2x^3 + ((18i^3 \log(e)^2 - 9i^3 \log(e) + i^3) * b^4c^2d^2 + 2(6i^3 \log(e) - i^3) * ab^3cd^3 - (3i^3 \log(e) - i^3) * a^2b^2d^4) * B^2x^2 + ((12i^3 \log(e)^2 - 18i^3 \log(e) + 7i^3) * b^4c^3d + (36i^3 \log(e) - 19i^3) * ab^3c^2d^2 - (24i^3 \log(e) - 17i^3) * a^2b^2cd^3 + (6i^3 \log(e) - 5i^3) * a^3bd^4) * B^2x + 3(B^2b^4d^4i^3x^4 + 4B^2b^4cd^3i^3x^3 + 6B^2b^4c^2d^2i^3x^2 + 4B^2b^4c^3di^3x + B^2b^4c^4i^3) * \log(dx + c)^2 + (6B^2b^4d^4i^3x^4 * \log(e) + 2(ab^3d^4i^3 + (12i^3 \log(e) - i^3) * b^4cd^3) * B^2x^3 + 3(4ab^3cd^3i^3 - a^2b^2d^4i^3 + 3(4i^3 \log(e) - i^3) * b^4c^2d^2) * B^2x^2 + 6(6ab^3c^2d^2i^3 - 4a^2b^2cd^3i^3 + a^3bd^4i^3 + (4i^3 \log(e) - 3i^3) * b^4c^3d) * B^2x + (6(4i^3 \log(e) - 3i^3) * ab^3c^3d - 9(4i^3 \log(e) - 5i^3) * a^2b^2c^2d^2 + 2(12i^3 \log(e) - 19i^3) * a^3b^2cd^3 - (6i^3 \log(e) - 11i^3) * a^4d^4) * B^2) * \log(bx + a) - (6B^2b^4d^4i^3x^4 * \log(e) + 2(ab^3d^4i^3 + (12i^3 \log(e) - i^3) * b^4cd^3) * B^2x^3 + 3(4ab^3cd^3i^3 - a^2b^2d^4i^3 + 3(4i^3 \log(e) - i^3) * b^4c^2d^2) * B^2x^2 + 6(6ab^3c^2d^2i^3 - 4a^2b^2cd^3i^3 + a^3bd^4i^3 + (4i^3 \log(e) - 3i^3) * b^4c^3d) * B^2x + 6(B^2b^4d^4i^3x^4 + 4B^2b^4cd^3i^3x^3 + 6B^2b^4c^2d^2i^3x^2 + 4B^2b^4c^3di^3x + (4ab^3c^3di^3 - 6a^2b^2c^2d^2i^3 + 4a^3b^2cd^3i^3 - a^4d^4i^3) * B^2) * \log(bx + a)) / (b^4d)
\end{aligned}$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

integral  $\left( A^2 d^3 i^3 x^3 + 3 A^2 c d^2 i^3 x^2 + 3 A^2 c^2 d i^3 x + A^2 c^3 i^3 + (B^2 d^3 i^3 x^3 + 3 B^2 c d^2 i^3 x^2 + 3 B^2 c^2 d i^3 x + B^2 c^3 i^3) \log\left(\frac{bex + a}{dx + c}\right) \right)$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2,x, algorithm="fricas")

```
[Out] integral(A^2*d^3*i^3*x^3 + 3*A^2*c*d^2*i^3*x^2 + 3*A^2*c^2*d*i^3*x + A^2*c^3*i^3 + (B^2*d^3*i^3*x^3 + 3*B^2*c*d^2*i^3*x^2 + 3*B^2*c^2*d*i^3*x + B^2*c^3*i^3)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*d^3*i^3*x^3 + 3*A*B*c*d^2*i^3*x^2 + 3*A*B*c^2*d*i^3*x + A*B*c^3*i^3)*log((b*e*x + a*e)/(d*x + c)), x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c))))**2,x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int (dix + ci)^3 \left( B \log \left( \frac{(bx + a)e}{dx + c} \right) + A \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log((b*x + a)*e/(d*x + c)) + A)^2, x)
```

$$3.78 \quad \int \frac{(ci+dx)^3 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)^2}{ag+bgx} dx$$

**Optimal.** Leaf size=712

$$\frac{2Bi^3(bc-ad)^3 \text{PolyLog}\left(2, \frac{b(c+dx)}{d(a+bx)}\right) \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{b^4g} + \frac{2B^2i^3(bc-ad)^3 \text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)}{b^4g} - \frac{5B^2i^3(bc-ad)^3 \text{PolyLog}\left(3, \frac{b(c+dx)}{d(a+bx)}\right)}{3b^4g}$$

```
[Out] (B^2*d*(b*c - a*d)^2*i^3*x)/(3*b^3*g) + (B^2*(b*c - a*d)^3*i^3*Log[(a + b*x)/(c + d*x)])/(3*b^4*g) - (5*B*d*(b*c - a*d)^2*i^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b^4*g) - (B*(b*c - a*d)*i^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b^2*g) + (2*B*(b*c - a*d)^3*i^3*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^4*g) + (d*(b*c - a*d)^2*i^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2)/(b^4*g) + ((b*c - a*d)*i^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2)/(2*b^2*g) + (i^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2)/(3*b*g) + (2*B^2*(b*c - a*d)^3*i^3*Log[c + d*x])/(b^4*g) + (5*B*(b*c - a*d)^3*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x]])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(3*b^4*g) - ((b*c - a*d)^3*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^4*g) + (2*B^2*(b*c - a*d)^3*i^3*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b^4*g) - (5*B^2*(b*c - a*d)^3*i^3*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(3*b^4*g) + (2*B*(b*c - a*d)^3*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x]])*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g) + (2*B^2*(b*c - a*d)^3*i^3*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g)
```

**Rubi [B]** time = 5.68693, antiderivative size = 1868, normalized size of antiderivative = 2.62, number of steps used = 106, number of rules used = 28, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.667$ , Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2500, 2440, 2434, 2433, 2375, 2317, 2374, 6589, 2499, 2302, 30, 2396, 2525, 2486, 31, 43}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2)/(a*g + b*g*x), x]
```

```
[Out] (-5*A*B*d*(b*c - a*d)^2*i^3*x)/(3*b^3*g) + (B^2*d*(b*c - a*d)^2*i^3*x)/(3*b^3*g) + (B^2*(b*c - a*d)^3*i^3*Log[a + b*x])/(3*b^4*g) - (a*B^2*d*(b*c - a*d)^2*i^3*x)/(3*b^3*g)
```

$$\begin{aligned}
& d)^2 i^3 \text{Log}[a + b*x]^2 / (b^4 * g) + (5 * B^2 * (b*c - a*d)^3 i^3 \text{Log}[a + b*x]^2) / (6 * b^4 * g) - (A * B * (b*c - a*d)^3 i^3 \text{Log}[g * (a + b*x)]^2) / (b^4 * g) + (B^2 * (b*c - a*d)^3 i^3 \text{Log}[g * (a + b*x)]^3) / (3 * b^4 * g) - (B^2 * (b*c - a*d)^3 i^3 \text{Log}[a + b*x]^2 \text{Log}[-c - d*x]) / (b^4 * g) + (2 * B^2 * (b*c - a*d)^3 i^3 \text{Log}[a + b*x] * \text{Log}[g * (a + b*x)] * \text{Log}[-c - d*x]) / (b^4 * g) - (B^2 * (b*c - a*d)^3 i^3 \text{Log}[g * (a + b*x)]^2 \text{Log}[-c - d*x]) / (b^4 * g) + (B^2 * (b*c - a*d)^3 i^3 \text{Log}[-((d * (a + b*x)) / (b*c - a*d))] * \text{Log}[(c + d*x)^{-1}]^2) / (b^4 * g) - (B^2 * (b*c - a*d)^3 i^3 \text{Log}[g * (a + b*x)] * \text{Log}[(c + d*x)^{-1}]^2) / (b^4 * g) - (5 * B^2 * d * (b*c - a*d)^2 i^3 * (a + b*x) * \text{Log}[(e * (a + b*x)) / (c + d*x)]) / (3 * b^4 * g) - (B * (b*c - a*d) * i^3 * (c + d*x)^2 * (A + B * \text{Log}[(e * (a + b*x)) / (c + d*x)])) / (3 * b^2 * g) + (2 * a * B * d * (b*c - a*d)^2 i^3 * \text{Log}[a + b*x] * (A + B * \text{Log}[(e * (a + b*x)) / (c + d*x)])) / (b^4 * g) - (5 * B * (b*c - a*d)^3 i^3 \text{Log}[a + b*x] * (A + B * \text{Log}[(e * (a + b*x)) / (c + d*x)])) / (3 * b^4 * g) + (d * (b*c - a*d)^2 i^3 * x * (A + B * \text{Log}[(e * (a + b*x)) / (c + d*x)]^2) / (b^3 * g) + ((b*c - a*d) * i^3 * (c + d*x)^2 * (A + B * \text{Log}[(e * (a + b*x)) / (c + d*x)]^2) / (2 * b^2 * g) + (i^3 * (c + d*x)^3 * (A + B * \text{Log}[(e * (a + b*x)) / (c + d*x)]^2) / (3 * b * g) + (5 * B^2 * (b*c - a*d)^3 i^3 \text{Log}[c + d*x]) / (3 * b^4 * g) + (2 * B^2 * c * (b*c - a*d)^2 i^3 \text{Log}[-((d * (a + b*x)) / (b*c - a*d))] * \text{Log}[c + d*x]) / (b^3 * g) - (2 * B * c * (b*c - a*d)^2 i^3 * (A + B * \text{Log}[(e * (a + b*x)) / (c + d*x)]) * \text{Log}[c + d*x]) / (b^3 * g) - (B^2 * c * (b*c - a*d)^2 i^3 \text{Log}[c + d*x]^2) / (b^3 * g) + (2 * a * B^2 * d * (b*c - a*d)^2 i^3 * \text{Log}[a + b*x] * \text{Log}[(b * (c + d*x)) / (b*c - a*d)]) / (b^4 * g) - (5 * B^2 * (b*c - a*d)^3 i^3 \text{Log}[a + b*x] * \text{Log}[(b * (c + d*x)) / (b*c - a*d)]) / (3 * b^4 * g) + (B^2 * (b*c - a*d)^3 i^3 \text{Log}[a + b*x]^2 * \text{Log}[(b * (c + d*x)) / (b*c - a*d)]) / (b^4 * g) + (B^2 * (b*c - a*d)^3 i^3 \text{Log}[g * (a + b*x)]^2 * \text{Log}[(b * (c + d*x)) / (b*c - a*d)]) / (b^4 * g) + ((b*c - a*d)^3 i^3 * (A + B * \text{Log}[(e * (a + b*x)) / (c + d*x)]^2 * \text{Log}[a * g + b * g * x]) / (b^4 * g) + (2 * A * B * (b*c - a*d)^3 i^3 \text{Log}[(b * (c + d*x)) / (b*c - a*d)] * \text{Log}[a * g + b * g * x]) / (b^4 * g) - (2 * B^2 * (b*c - a*d)^3 i^3 * (\text{Log}[a + b*x] + \text{Log}[(c + d*x)^{-1}]) - \text{Log}[(e * (a + b*x)) / (c + d*x)]) * \text{Log}[(b * (c + d*x)) / (b*c - a*d)] * \text{Log}[a * g + b * g * x]) / (b^4 * g) - (B^2 * (b*c - a*d)^3 i^3 \text{Log}[(e * (a + b*x)) / (c + d*x)] * \text{Log}[a * g + b * g * x]^2) / (b^4 * g) - (B^2 * (b*c - a*d)^3 i^3 \text{Log}[(b * (c + d*x)) / (b*c - a*d)] * \text{Log}[a * g + b * g * x]^2) / (b^4 * g) + (2 * a * B^2 * d * (b*c - a*d)^2 i^3 * \text{PolyLog}[2, -((d * (a + b*x)) / (b*c - a*d))]) / (b^4 * g) + (2 * A * B * (b*c - a*d)^3 i^3 * \text{PolyLog}[2, -((d * (a + b*x)) / (b*c - a*d))]) / (b^4 * g) - (5 * B^2 * (b*c - a*d)^3 i^3 * \text{PolyLog}[2, -((d * (a + b*x)) / (b*c - a*d))]) / (3 * b^4 * g) + (2 * B^2 * (b*c - a*d)^3 i^3 \text{Log}[a + b*x] * \text{PolyLog}[2, -((d * (a + b*x)) / (b*c - a*d))]) / (b^4 * g) - (2 * B^2 * (b*c - a*d)^3 i^3 * (\text{Log}[a + b*x] + \text{Log}[(c + d*x)^{-1}] - \text{Log}[(e * (a + b*x)) / (c + d*x)])) * \text{PolyLog}[2, -((d * (a + b*x)) / (b*c - a*d))]) / (b^4 * g) + (2 * B^2 * c * (b*c - a*d)^2 i^3 * \text{PolyLog}[2, (b * (c + d*x)) / (b*c - a*d)]) / (b^3 * g) - (2 * B^2 * (b*c - a*d)^3 i^3 \text{Log}[(c + d*x)^{-1}] * \text{PolyLog}[2, (b * (c + d*x)) / (b*c - a*d)]) / (b^4 * g) - (2 * B^2 * (b*c - a*d)^3 i^3 * \text{PolyLog}[3, -((d * (a + b*x)) / (b*c - a*d))]) / (b^4 * g) - (2 * B^2 * (b*c - a*d)^3 i^3 * \text{PolyLog}[3, (b * (c + d*x)) / (b*c - a*d)]) / (b^4 * g)
\end{aligned}$$

### Rule 2528

$\text{Int}(((a_.) + \text{Log}[(c_.) * (\text{RFx}_.)^{(p_.)}] * (b_.))^{(n_.)} * (\text{RGx}_.), x\_Symbol] \text{ :> With}$

```
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] := Simp[x*(a + b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rule 6688

```
Int[u_, x_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplerIntegrandQ[v, u, x]]
```

### Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]
```

### Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.))]^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))/((j_.) + (k_.)*(x_)), x_Symbol] := Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a + b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x), x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ[b*c - a*d, 0]
```

### Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Symbol] := Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*1)/l) + (e*x)/l)^n])*(f + g*Log[h*(-((j*k - i*1)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
```



b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]

#### Rule 2434

Int[(((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))\*((f\_.) + Log[(h\_.)\*((i\_.) + (j\_.)\*(x\_))^(m\_.)]\*(g\_.)))/(x\_), x\_Symbol] := Simp[Log[x]\*(a + b\*Log[c\*(d + e\*x)^n])\*(f + g\*Log[h\*(i + j\*x)^m]), x] + (-Dist[e\*g\*m, Int[(Log[x]\*(a + b\*Log[c\*(d + e\*x)^n]))/(d + e\*x), x], x] - Dist[b\*j\*n, Int[(Log[x]\*(f + g\*Log[h\*(i + j\*x)^m))]/(i + j\*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, m, n}, x] && EqQ[e\*i - d\*j, 0]

#### Rule 2433

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_.) + Log[(h\_.)\*((i\_.) + (j\_.)\*(x\_))^(m\_.)]\*(g\_.))\*((k\_.) + (l\_.)\*(x\_))^(r\_.), x\_Symbol] := Dist[1/e, Subst[Int[((k\*x)/d)^r\*(a + b\*Log[c\*x^n])^p\*(f + g\*Log[h\*(e\*i - d\*j)/e + (j\*x)/e]^m)], x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e\*k - d\*l, 0]

#### Rule 2375

Int[(Log[(d\_.)\*((e\_) + (f\_.)\*(x\_))^(m\_.))]^(r\_.)\*((a\_.) + Log[(c\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)/(x\_), x\_Symbol] := Simp[(Log[d\*(e + f\*x^m)^r]\*(a + b\*Log[c\*x^n])^(p + 1))/(b\*n\*(p + 1)), x] - Dist[(f\*m\*r)/(b\*n\*(p + 1)), Int[(x^(m - 1)\*(a + b\*Log[c\*x^n])^(p + 1))/(e + f\*x^m), x], x] /; FreeQ[{a, b, c, d, e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d\*e, 1]

#### Rule 2317

Int[((a\_.) + Log[(c\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)/((d\_) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^p)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

#### Rule 2374

Int[(Log[(d\_.)\*((e\_) + (f\_.)\*(x\_))^(m\_.))]\*(a\_.) + Log[(c\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)/(x\_), x\_Symbol] := -Simp[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^p)/m, x] + Dist[(b\*n\*p)/m, Int[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0] && EqQ[d\*e, 1]

#### Rule 6589

Int[PolyLog[n\_, (c\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)]/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] := Simp[PolyLog[n + 1, c\*(a + b\*x)^p]/(e\*p), x] /; FreeQ[{a, b, c, d, e, n, p}, x] && EqQ[b\*d, a\*e]

### Rule 2499

Int[(Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.)]^(r\_.)]\*((s\_.) + Log[(i\_.)\*((g\_.) + (h\_.)\*(x\_))^(n\_.)]\*(t\_.))^(m\_.)]/((j\_.) + (k\_.)\*(x\_)), x\_Symbol] := Simp[((s + t\*Log[i\*(g + h\*x)^n])^(m + 1)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r)]/(k\*n\*t\*(m + 1)), x] + (-Dist[(b\*p\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(a + b\*x), x], x] - Dist[(d\*q\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(c + d\*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0] && EqQ[h\*j - g\*k, 0] && IGtQ[m, 0]

### Rule 2302

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/(x\_), x\_Symbol] := Dist[1/(b\*n), Subst[Int[x^p, x], x, a + b\*Log[c\*x^n]], x] /; FreeQ[{a, b, c, n, p}, x]

### Rule 30

Int[(x\_)^(m\_.), x\_Symbol] := Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && NeQ[m, -1]

### Rule 2396

Int[((a\_.) + Log[(c\_.)\*((d\_.) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])^p)/g, x] - Dist[(b\*e\*n\*p)/g, Int[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])^(p - 1))/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p}, x] && NeQ[e\*f - d\*g, 0] && IGtQ[p, 1]

### Rule 2525

Int[((a\_.) + Log[(c\_.)\*(RFX\_)^(p\_.)]\*(b\_.))^(n\_.)\*((d\_.) + (e\_.)\*(x\_))^(m\_.), x\_Symbol] := Simp[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFX^p])^n)/(e\*(m + 1)), x] - Dist[(b\*n\*p)/(e\*(m + 1)), Int[SimplifyIntegrand[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFX^p])^(n - 1)\*D[RFX, x])/RFX, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

### Rule 2486

```

Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q]^r]^s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]

```

### Rule 31

```

Int[((a_.) + (b_.)*(x_))^(n_.), x_Symbol] := Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]

```

### Rule 43

```

Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])

```

### Rubi steps

$$\begin{aligned}
\int \frac{(78c + 78dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{ag + bgx} dx &= \int \left( \frac{474552d(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3g} + \frac{6084d(bc - ad)(78c + 78dx)}{b^2g} \right) dx \\
&= \frac{(474552(bc - ad)^3) \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{ag+bgx} dx}{b^3} + \frac{(78d) \int (78c + 78dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{bg} \\
&= \frac{474552d(bc - ad)^2 x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3g} + \frac{237276(bc - ad)(c + dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g} \\
&= \frac{474552d(bc - ad)^2 x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3g} + \frac{237276(bc - ad)(c + dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g} \\
&= \frac{474552d(bc - ad)^2 x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3g} + \frac{237276(bc - ad)(c + dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g} \\
&= \frac{474552d(bc - ad)^2 x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3g} + \frac{237276(bc - ad)(c + dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g} \\
&= -\frac{790920ABd(bc - ad)^2 x}{b^3g} - \frac{158184B(bc - ad)(c + dx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g} \\
&= -\frac{790920ABd(bc - ad)^2 x}{b^3g} - \frac{790920B^2d(bc - ad)^2(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^4g} - \frac{158184B^2d(bc - ad)^2(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^4g} \\
&= -\frac{790920ABd(bc - ad)^2 x}{b^3g} - \frac{790920B^2d(bc - ad)^2(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^4g} - \frac{158184B^2d(bc - ad)^2(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^4g} \\
&= -\frac{790920ABd(bc - ad)^2 x}{b^3g} + \frac{158184B^2d(bc - ad)^2 x}{b^3g} + \frac{158184B^2(bc - ad)^3 \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^4g} \\
&= -\frac{790920ABd(bc - ad)^2 x}{b^3g} + \frac{158184B^2d(bc - ad)^2 x}{b^3g} + \frac{158184B^2(bc - ad)^3 \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^4g} \\
&= -\frac{790920ABd(bc - ad)^2 x}{b^3g} + \frac{158184B^2d(bc - ad)^2 x}{b^3g} + \frac{158184B^2(bc - ad)^3 \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^4g} \\
&= -\frac{790920ABd(bc - ad)^2 x}{b^3g} + \frac{158184B^2d(bc - ad)^2 x}{b^3g} + \frac{158184B^2(bc - ad)^3 \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^4g}
\end{aligned}$$

**Mathematica [B]** time = 3.92239, size = 3984, normalized size = 5.6

Result too large to show

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))^2)/(a\*g + b\*g\*x), x]

[Out]  $(i^3*(108*A*b^3*B*c^3 - 216*a*A*b^2*B*c^2*d - 12*a*b^2*B^2*c^2*d + 144*a^2*A*b*B*c*d^2 - 18*a^2*b*B^2*c*d^2 - 36*a^3*A*B*d^3 - 36*a^3*B^2*d^3 + 54*A^2*b^3*c^2*d*x - 42*A*b^3*B*c^2*d*x + 6*b^3*B^2*c^2*d*x - 54*a*A^2*b^2*c*d^2*x + 72*a*A*b^2*B*c*d^2*x - 12*a*b^2*B^2*c*d^2*x + 18*a^2*A^2*b*d^3*x - 30*a^2*A*b*B*d^3*x + 6*a^2*b*B^2*d^3*x + 27*A^2*b^3*c*d^2*x^2 - 6*A*b^3*B*c*d^2*x^2 - 9*a*A^2*b^2*d^3*x^2 + 6*a*A*b^2*B*d^3*x^2 + 6*A^2*b^3*d^3*x^3 + 108*a*A*b^2*B*c^2*d*Log[a/b + x] + 12*a*b^2*B^2*c^2*d*Log[a/b + x] - 108*a^2*A*b*B*c*d^2*Log[a/b + x] - 18*a^2*b*B^2*c*d^2*Log[a/b + x] + 36*a^3*A*B*d^3*Log[a/b + x] - 13*a^3*B^2*d^3*Log[a/b + x] + 18*A*b^3*B*c^3*Log[a/b + x]^2 - 54*a*A*b^2*B*c^2*d*Log[a/b + x]^2 + 54*a^2*A*b*B*c*d^2*Log[a/b + x]^2 - 18*a^3*A*B*d^3*Log[a/b + x]^2 - 3*a^3*B^2*d^3*Log[a/b + x]^2 + 12*a^3*B^2*d^3*Log[a/b + x]^3 - 108*A*b^3*B*c^3*Log[c/d + x] - 22*b^3*B^2*c^3*Log[c/d + x] + 108*a*A*b^2*B*c^2*d*Log[c/d + x] - 27*a*b^2*B^2*c^2*d*Log[c/d + x] - 36*a^2*A*b*B*c*d^2*Log[c/d + x] - 36*a^3*B^2*d^3*Log[c/d + x] + 36*a^2*b*B^2*c*d^2*Log[a/b + x]*Log[c/d + x] - 30*a^3*B^2*d^3*Log[a/b + x]*Log[c/d + x] + 6*b^3*B^2*c^3*Log[c/d + x]^2 + 9*a*b^2*B^2*c^2*d*Log[c/d + x]^2 - 18*a^2*b*B^2*c*d^2*Log[c/d + x]^2 + 18*A^2*b^3*c^3*Log[a + b*x] - 54*a*A^2*b^2*c^2*d*Log[a + b*x] + 54*a^2*A^2*b*c*d^2*Log[a + b*x] - 54*a^2*A*b*B*c*d^2*Log[a + b*x] + 6*a^2*b*B^2*c*d^2*Log[a + b*x] - 18*a^3*A^2*d^3*Log[a + b*x] + 30*a^3*A*B*d^3*Log[a + b*x] + 13*a^3*B^2*d^3*Log[a + b*x] - 36*A*b^3*B*c^3*Log[a/b + x]*Log[a + b*x] + 108*a*A*b^2*B*c^2*d*Log[a/b + x]*Log[a + b*x] - 108*a^2*A*b*B*c*d^2*Log[a/b + x]*Log[a + b*x] + 36*a^3*A*B*d^3*Log[a/b + x]*Log[a + b*x] - 30*a^3*B^2*d^3*Log[a/b + x]*Log[a + b*x] - 18*a^3*B^2*d^3*Log[a/b + x]^2*Log[a + b*x] + 36*A*b^3*B*c^3*Log[c/d + x]*Log[a + b*x] - 108*a*A*b^2*B*c^2*d*Log[c/d + x]*Log[a + b*x] + 108*a^2*A*b*B*c*d^2*Log[c/d + x]*Log[a + b*x] - 36*a^3*A*B*d^3*Log[c/d + x]*Log[a + b*x] + 30*a^3*B^2*d^3*Log[c/d + x]*Log[a + b*x] + 36*a^3*B^2*d^3*Log[a/b + x]*Log[c/d + x]*Log[a + b*x] - 18*a^3*B^2*d^3*Log[c/d + x]^2*Log[a + b*x] - 36*A*b^3*B*c^3*Log[c/d + x]*Log[(d*(a + b*x))/(-b*c) + a*d] + 108*a*A*b^2*B*c^2*d*Log[c/d + x]*Log[(d*(a + b*x))/(-b*c) + a*d] - 108*a^2*A*b*B*c*d^2*Log[c/d + x]*Log[(d*(a + b*x))/(-b*c) + a*d] + 36*a^3*A*B*d^3*Log[c/d + x]*Log[(d*(a + b*x))/(-b*c) + a*d] - 36*a^3*B^2*d^3*Log[a/b + x]*Log[c/d + x]*Log[(d*(a + b*x))/(-b*c) + a*d] + 18*a^3*B^2*d^3*Log[c/d + x]^2*Log[(d*(a + b*x))/(-b*c) + a*d] - 54*b^3*B^2*c^3*Log[((b*c - a*d)*e)/(c + d*x)] + 108*a*b^2*B^2*c^2*d*Log[((b*c - a*d)*e)/(c + d*x)] - 54*a^2*b*B^2*c*d^2*Log[((b*c - a*d)*e)/(c + d*x)]$

$$\begin{aligned}
& *e)/(c + d*x)] - 54*a*b^2*B^2*c^2*d*Log[(e*(a + b*x))/(c + d*x)] + 90*a^2*b \\
& *B^2*c*d^2*Log[(e*(a + b*x))/(c + d*x)] - 36*a^3*B^2*d^3*Log[(e*(a + b*x))/ \\
& (c + d*x)] + 108*A*b^3*B*c^2*d*x*Log[(e*(a + b*x))/(c + d*x)] - 42*b^3*B^2* \\
& c^2*d*x*Log[(e*(a + b*x))/(c + d*x)] - 108*a*A*b^2*B*c*d^2*x*Log[(e*(a + b* \\
& x))/(c + d*x)] + 72*a*b^2*B^2*c*d^2*x*Log[(e*(a + b*x))/(c + d*x)] + 36*a^2 \\
& *A*b*B*d^3*x*Log[(e*(a + b*x))/(c + d*x)] - 30*a^2*b*B^2*d^3*x*Log[(e*(a + \\
& b*x))/(c + d*x)] + 54*A*b^3*B*c*d^2*x^2*Log[(e*(a + b*x))/(c + d*x)] - 6*b^ \\
& 3*B^2*c*d^2*x^2*Log[(e*(a + b*x))/(c + d*x)] - 18*a*A*b^2*B*d^3*x^2*Log[(e* \\
& (a + b*x))/(c + d*x)] + 6*a*b^2*B^2*d^3*x^2*Log[(e*(a + b*x))/(c + d*x)] + \\
& 12*A*b^3*B*d^3*x^3*Log[(e*(a + b*x))/(c + d*x)] + 36*a^3*B^2*d^3*Log[a/b + \\
& x]*Log[(e*(a + b*x))/(c + d*x)] - 18*a^3*B^2*d^3*Log[a/b + x]^2*Log[(e*(a + \\
& b*x))/(c + d*x)] - 36*a^2*b*B^2*c*d^2*Log[c/d + x]*Log[(e*(a + b*x))/(c + \\
& d*x)] + 36*A*b^3*B*c^3*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] - 108*a*A* \\
& b^2*B*c^2*d*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] + 108*a^2*A*b*B*c*d^2 \\
& *Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] - 36*a^3*A*B*d^3*Log[a + b*x]*Lo \\
& g[(e*(a + b*x))/(c + d*x)] + 30*a^3*B^2*d^3*Log[a + b*x]*Log[(e*(a + b*x))/ \\
& (c + d*x)] + 36*a^3*B^2*d^3*Log[a/b + x]*Log[a + b*x]*Log[(e*(a + b*x))/(c \\
& + d*x)] - 36*a^3*B^2*d^3*Log[c/d + x]*Log[a + b*x]*Log[(e*(a + b*x))/(c + \\
& d*x)] + 36*a^3*B^2*d^3*Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[(e \\
& *(a + b*x))/(c + d*x)] + 54*a*b^2*B^2*c^2*d*Log[(e*(a + b*x))/(c + d*x)]^2 \\
& - 81*a^2*b*B^2*c*d^2*Log[(e*(a + b*x))/(c + d*x)]^2 + 54*b^3*B^2*c^2*d*x*Lo \\
& g[(e*(a + b*x))/(c + d*x)]^2 - 54*a*b^2*B^2*c*d^2*x*Log[(e*(a + b*x))/(c + \\
& d*x)]^2 + 18*a^2*b*B^2*d^3*x*Log[(e*(a + b*x))/(c + d*x)]^2 + 27*b^3*B^2*c* \\
& d^2*x^2*Log[(e*(a + b*x))/(c + d*x)]^2 - 9*a*b^2*B^2*d^3*x^2*Log[(e*(a + b* \\
& x))/(c + d*x)]^2 + 6*b^3*B^2*d^3*x^3*Log[(e*(a + b*x))/(c + d*x)]^2 - 18*b^ \\
& 3*B^2*c^3*Log[-(b*c) + a*d]/(d*(a + b*x))*Log[(e*(a + b*x))/(c + d*x)]^2 \\
& - 18*a^3*B^2*d^3*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)]^2 - 18*a*b^2*B^2 \\
& *c^2*d*Log[(e*(a + b*x))/(c + d*x)]^3 + 18*a^2*b*B^2*c*d^2*Log[(e*(a + b*x) \\
& )/(c + d*x)]^3 + 42*A*b^3*B*c^3*Log[c + d*x] + 4*b^3*B^2*c^3*Log[c + d*x] - \\
& 18*a*A*b^2*B*c^2*d*Log[c + d*x] + 15*a*b^2*B^2*c^2*d*Log[c + d*x] + 66*a^2 \\
& *b*B^2*c*d^2*Log[c + d*x] + 12*b^3*B^2*c^3*Log[a/b + x]*Log[c + d*x] + 18*a \\
& *b^2*B^2*c^2*d*Log[a/b + x]*Log[c + d*x] - 12*b^3*B^2*c^3*Log[c/d + x]*Log[ \\
& c + d*x] - 18*a*b^2*B^2*c^2*d*Log[c/d + x]*Log[c + d*x] - 12*b^3*B^2*c^3*Lo \\
& g[(e*(a + b*x))/(c + d*x)]*Log[c + d*x] - 18*a*b^2*B^2*c^2*d*Log[(e*(a + b* \\
& x))/(c + d*x)]*Log[c + d*x] - 12*b^3*B^2*c^3*Log[a/b + x]*Log[(b*(c + d*x)) \\
& / (b*c - a*d)] - 18*a*b^2*B^2*c^2*d*Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a* \\
& d)] - 36*a^2*b*B^2*c*d^2*Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] + 66*a \\
& ^3*B^2*d^3*Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] - 18*a^3*B^2*d^3*Log \\
& [a/b + x]^2*Log[(b*(c + d*x))/(b*c - a*d)] + 54*b^3*B^2*c^3*Log[(e*(a + b*x) \\
& )/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] - 216*a*b^2*B^2*c^2*d*Log[(e*( \\
& a + b*x))/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + 162*a^2*b*B^2*c*d^2*L \\
& og[(e*(a + b*x))/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + 54*a*b^2*B^2*c \\
& ^2*d*Log[(e*(a + b*x))/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] - 54*a^2 \\
& *b*B^2*c*d^2*Log[(e*(a + b*x))/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] \\
& - 6*B^2*(2*b^3*c^3 + 3*a*b^2*c^2*d + 6*a^2*b*c*d^2 - 11*a^3*d^3 + 6*a^3*d^3
\end{aligned}$$

\*Log[a/b + x])\*PolyLog[2, (d\*(a + b\*x))/(-(b\*c) + a\*d)] + 54\*b\*B^2\*c\*(b\*c - a\*d)\*(b\*c - 3\*a\*d + 2\*a\*d\*Log[(e\*(a + b\*x))/(c + d\*x)])\*PolyLog[2, (d\*(a + b\*x))/(b\*(c + d\*x))] - 36\*A\*b^3\*B\*c^3\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)] + 108\*a\*A\*b^2\*B\*c^2\*d\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)] - 108\*a^2\*A\*b\*B\*c\*d^2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)] + 36\*a^3\*A\*B\*d^3\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)] - 36\*a^3\*B^2\*d^3\*Log[a/b + x]\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)] + 36\*a^3\*B^2\*d^3\*Log[(e\*(a + b\*x))/(c + d\*x)]\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)] + 36\*b^3\*B^2\*c^3\*Log[(e\*(a + b\*x))/(c + d\*x)]\*PolyLog[2, (b\*(c + d\*x))/(d\*(a + b\*x))] + 36\*a^3\*B^2\*d^3\*PolyLog[3, (d\*(a + b\*x))/(-(b\*c) + a\*d)] - 108\*a\*b^2\*B^2\*c^2\*d\*PolyLog[3, (d\*(a + b\*x))/(b\*(c + d\*x))] + 108\*a^2\*b\*B^2\*c\*d^2\*PolyLog[3, (d\*(a + b\*x))/(b\*(c + d\*x))] + 36\*a^3\*B^2\*d^3\*PolyLog[3, (b\*(c + d\*x))/(b\*c - a\*d)] + 36\*b^3\*B^2\*c^3\*PolyLog[3, (b\*(c + d\*x))/(d\*(a + b\*x))])/(18\*b^4\*g)

**Maple [F]** time = 3.243, size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3}{bgx + ag} \left( A + B \ln \left( \frac{e(bx + a)}{dx + c} \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*i\*x+c\*i)^3\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g),x)

[Out] int((d\*i\*x+c\*i)^3\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g),x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g),x, algorithm="maxima")

[Out] 3\*A^2\*c^2\*d\*i^3\*(x/(b\*g) - a\*log(b\*x + a)/(b^2\*g)) - 1/6\*A^2\*d^3\*i^3\*(6\*a^3\*log(b\*x + a)/(b^4\*g) - (2\*b^2\*x^3 - 3\*a\*b\*x^2 + 6\*a^2\*x)/(b^3\*g)) + 3/2\*A^2\*c\*d^2\*i^3\*(2\*a^2\*log(b\*x + a)/(b^3\*g) + (b\*x^2 - 2\*a\*x)/(b^2\*g)) + A^2\*c^3\*i^3\*log(b\*g\*x + a\*g)/(b\*g) + 1/6\*(2\*B^2\*b^3\*d^3\*i^3\*x^3 + 3\*(3\*b^3\*c\*d^2\*i^3 - a\*b^2\*d^3\*i^3)\*B^2\*x^2 + 6\*(3\*b^3\*c^2\*d\*i^3 - 3\*a\*b^2\*c\*d^2\*i^3 + a^2

```

*b*d^3*i^3)*B^2*x + 6*(b^3*c^3*i^3 - 3*a*b^2*c^2*d*i^3 + 3*a^2*b*c*d^2*i^3
- a^3*d^3*i^3)*B^2*log(b*x + a)*log(d*x + c)^2/(b^4*g) - integrate(-1/3*(3
*B^2*b^4*c^4*i^3*log(e)^2 + 6*A*B*b^4*c^4*i^3*log(e) + 3*(B^2*b^4*d^4*i^3*1
og(e)^2 + 2*A*B*b^4*d^4*i^3*log(e))*x^4 + 12*(B^2*b^4*c*d^3*i^3*log(e)^2 +
2*A*B*b^4*c*d^3*i^3*log(e))*x^3 + 18*(B^2*b^4*c^2*d^2*i^3*log(e)^2 + 2*A*B*
b^4*c^2*d^2*i^3*log(e))*x^2 + 3*(B^2*b^4*d^4*i^3*x^4 + 4*B^2*b^4*c*d^3*i^3*
x^3 + 6*B^2*b^4*c^2*d^2*i^3*x^2 + 4*B^2*b^4*c^3*d*i^3*x + B^2*b^4*c^4*i^3)*
log(b*x + a)^2 + 12*(B^2*b^4*c^3*d*i^3*log(e)^2 + 2*A*B*b^4*c^3*d*i^3*log(e
))*x + 6*(B^2*b^4*c^4*i^3*log(e) + A*B*b^4*c^4*i^3 + (B^2*b^4*d^4*i^3*log(e
) + A*B*b^4*d^4*i^3))*x^4 + 4*(B^2*b^4*c*d^3*i^3*log(e) + A*B*b^4*c*d^3*i^3)
*x^3 + 6*(B^2*b^4*c^2*d^2*i^3*log(e) + A*B*b^4*c^2*d^2*i^3)*x^2 + 4*(B^2*b^
4*c^3*d*i^3*log(e) + A*B*b^4*c^3*d*i^3)*x)*log(b*x + a) - (6*B^2*b^4*c^4*i^
3*log(e) + 6*A*B*b^4*c^4*i^3 + 2*(3*A*B*b^4*d^4*i^3 + (3*i^3*log(e) + i^3)*
B^2*b^4*d^4)*x^4 + (24*A*B*b^4*c*d^3*i^3 - (a*b^3*d^4*i^3 - 3*(8*i^3*log(e)
+ 3*i^3)*b^4*c*d^3)*B^2)*x^3 + 3*(12*A*B*b^4*c^2*d^2*i^3 - (3*a*b^3*c*d^3*
i^3 - a^2*b^2*d^4*i^3 - 6*(2*i^3*log(e) + i^3)*b^4*c^2*d^2)*B^2)*x^2 + 6*(4
*A*B*b^4*c^3*d*i^3 + (4*b^4*c^3*d*i^3*log(e) + 3*a*b^3*c^2*d^2*i^3 - 3*a^2*
b^2*c*d^3*i^3 + a^3*b*d^4*i^3)*B^2)*x + 6*(B^2*b^4*d^4*i^3*x^4 + 4*B^2*b^4*
c*d^3*i^3*x^3 + 6*B^2*b^4*c^2*d^2*i^3*x^2 + (5*b^4*c^3*d*i^3 - 3*a*b^3*c^2*
d^2*i^3 + 3*a^2*b^2*c*d^3*i^3 - a^3*b*d^4*i^3)*B^2*x + (b^4*c^4*i^3 + a*b^3
*c^3*d*i^3 - 3*a^2*b^2*c^2*d^2*i^3 + 3*a^3*b*c*d^3*i^3 - a^4*d^4*i^3)*B^2)*
log(b*x + a)*log(d*x + c))/(b^5*d*g*x^2 + a*b^4*c*g + (b^5*c*g + a*b^4*d*g
)*x), x)

```

---

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{A^2 d^3 i^3 x^3 + 3 A^2 c d^2 i^3 x^2 + 3 A^2 c^2 d i^3 x + A^2 c^3 i^3 + \left( B^2 d^3 i^3 x^3 + 3 B^2 c d^2 i^3 x^2 + 3 B^2 c^2 d i^3 x + B^2 c^3 i^3 \right) \log \left( \frac{bex+ae}{dx+c} \right)^2}{bgx + ag} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```

[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x, algor
ithm="fricas")

```

```

[Out] integral((A^2*d^3*i^3*x^3 + 3*A^2*c*d^2*i^3*x^2 + 3*A^2*c^2*d*i^3*x + A^2*c
^3*i^3 + (B^2*d^3*i^3*x^3 + 3*B^2*c*d^2*i^3*x^2 + 3*B^2*c^2*d*i^3*x + B^2*c
^3*i^3)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*d^3*i^3*x^3 + 3*A*B*c*d^2*
i^3*x^2 + 3*A*B*c^2*d*i^3*x + A*B*c^3*i^3)*log((b*e*x + a*e)/(d*x + c)))/(b*
g*x + a*g), x)

```



---

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*\*3\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))\*\*2/(b\*g\*x+a\*g),x)

[Out] Timed out

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx + ci)^3 \left( B \log \left( \frac{(bx+a)e}{dx+c} \right) + A \right)^2}{bgx + ag} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g),x, algorithm="giac")

[Out] integrate((d\*i\*x + c\*i)^3\*(B\*log((b\*x + a)\*e/(d\*x + c)) + A)^2/(b\*g\*x + a\*g), x)

$$3.79 \quad \int \frac{(ci+dx)^3 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)^2}{(ag+bgx)^2} dx$$

**Optimal.** Leaf size=692

$$\frac{6Bdi^3(bc-ad)^2 \text{PolyLog}\left(2, \frac{b(c+dx)}{d(a+bx)}\right) \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{b^4g^2} + \frac{4B^2di^3(bc-ad)^2 \text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)}{b^4g^2} - \frac{B^2di^3(bc-ad)^2 \text{PolyLog}\left(3, \frac{b(c+dx)}{d(a+bx)}\right)}{b^4g^2}$$

```
[Out] (-2*B^2*(b*c - a*d)^2*i^3*(c + d*x))/(b^3*g^2*(a + b*x)) - (B*d^2*(b*c - a*d)*i^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^4*g^2) - (2*B*(b*c - a*d)^2*i^3*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^3*g^2*(a + b*x)) + (4*B*d*(b*c - a*d)^2*i^3*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^4*g^2) + (2*d^2*(b*c - a*d)*i^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]^2)/(b^4*g^2) - ((b*c - a*d)^2*i^3*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]^2)/(b^3*g^2*(a + b*x)) + (d*i^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]^2)/(2*b^2*g^2) + (B^2*d*(b*c - a*d)^2*i^3*Log[c + d*x])/(b^4*g^2) + (B*d*(b*c - a*d)^2*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^2) - (3*d*(b*c - a*d)^2*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]^2*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^2) + (4*B^2*d*(b*c - a*d)^2*i^3*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b^4*g^2) - (B^2*d*(b*c - a*d)^2*i^3*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^2) + (6*B*d*(b*c - a*d)^2*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^2) + (6*B^2*d*(b*c - a*d)^2*i^3*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^2)
```

**Rubi [B]** time = 4.81588, antiderivative size = 1751, normalized size of antiderivative = 2.53, number of steps used = 90, number of rules used = 23, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.548$ , Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 2486, 31, 44, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]^2)/(a*g + b*g*x)^2,x]
```

```
[Out] -((A*B*d^2*(b*c - a*d)*i^3*x)/(b^3*g^2)) - (2*B^2*(b*c - a*d)^3*i^3)/(b^4*g^2*(a + b*x)) - (2*B^2*d*(b*c - a*d)^2*i^3*Log[a + b*x])/(b^4*g^2) + (a^2*B
```

$$\begin{aligned}
& 2d^3i^3 \text{Log}[a + bx]^2 / (2b^4g^2) - (aB^2d^2(3bc - 2ad)i^3 \text{Log}[a + bx]^2) / (b^4g^2) - (3ABd^2(b^2c - a^2d)i^3 \text{Log}[a + bx]^2) / (b^4g^2) \\
& + (B^2d^2(b^2c - a^2d)i^3 \text{Log}[a + bx]^2) / (b^4g^2) - (B^2d^2(b^2c - a^2d)i^3(a + bx) \text{Log}[(e(a + bx))/(c + dx)]) / (b^4g^2) - (3B^2d^2(b^2c - a^2d)i^3 \text{Log}[-((b^2c - a^2d)/(d(a + bx)))] * \text{Log}[(e(a + bx))/(c + dx)])^2) / (b^4g^2) \\
& - (3B^2d^2(b^2c - a^2d)i^3 \text{Log}[a + bx] * \text{Log}[(e(a + bx))/(c + dx)]^2) / (b^4g^2) - (2B(b^2c - a^2d)^3i^3(A + B \text{Log}[(e(a + bx))/(c + dx)])) / (b^4g^2(a + bx)) - (a^2Bd^3i^3 \text{Log}[a + bx] * (A + B \text{Log}[(e(a + bx))/(c + dx)])) / (b^4g^2) \\
& + (2aBd^2(3bc - 2ad)i^3 \text{Log}[a + bx] * (A + B \text{Log}[(e(a + bx))/(c + dx)])) / (b^4g^2) - (2Bd^2(b^2c - a^2d)i^3 \text{Log}[a + bx] * (A + B \text{Log}[(e(a + bx))/(c + dx)])) / (b^4g^2) + (d^2(3bc - 2ad)i^3 * x * (A + B \text{Log}[(e(a + bx))/(c + dx)]^2) / (b^3g^2) + (d^3i^3 * x^2 * (A + B \text{Log}[(e(a + bx))/(c + dx)]^2) / (2b^2g^2) - ((b^2c - a^2d)^3i^3 * (A + B \text{Log}[(e(a + bx))/(c + dx)]^2) / (b^4g^2(a + bx)) + (3d * (b^2c - a^2d)^2i^3 \text{Log}[a + bx] * (A + B \text{Log}[(e(a + bx))/(c + dx)]^2) / (b^4g^2) + (3B^2d^2(b^2c - a^2d)i^3 \text{Log}[c + dx]) / (b^4g^2) - (B^2c^2d^2i^3 \text{Log}[-((d(a + bx))/(b^2c - a^2d))] * \text{Log}[c + dx]) / (b^2g^2) + (2B^2c^2d^2(3bc - 2ad)i^3 \text{Log}[-((d(a + bx))/(b^2c - a^2d))] * \text{Log}[c + dx]) / (b^3g^2) - (2B^2d^2(b^2c - a^2d)i^3 \text{Log}[-((d(a + bx))/(b^2c - a^2d))] * \text{Log}[c + dx]) / (b^4g^2) + (B^2c^2d^2i^3 * (A + B \text{Log}[(e(a + bx))/(c + dx)] * \text{Log}[c + dx]) / (b^2g^2) - (2B^2c^2d^2(3bc - 2ad)i^3 * (A + B \text{Log}[(e(a + bx))/(c + dx)] * \text{Log}[c + dx]) / (b^3g^2) + (2Bd^2(b^2c - a^2d)i^3 * (A + B \text{Log}[(e(a + bx))/(c + dx)] * \text{Log}[c + dx]) / (b^4g^2) + (B^2c^2d^2i^3 \text{Log}[c + dx]^2) / (2b^2g^2) - (B^2c^2d^2(3bc - 2ad)i^3 \text{Log}[c + dx]^2) / (b^3g^2) + (B^2d^2(b^2c - a^2d)i^3 \text{Log}[c + dx]^2) / (b^4g^2) - (a^2B^2d^3i^3 \text{Log}[a + bx] * \text{Log}[(b(c + dx))/(b^2c - a^2d)]) / (b^4g^2) + (2aB^2d^2(3bc - 2ad)i^3 \text{Log}[a + bx] * \text{Log}[(b(c + dx))/(b^2c - a^2d)]) / (b^4g^2) + (6ABd^2(b^2c - a^2d)i^3 \text{Log}[a + bx] * \text{Log}[(b(c + dx))/(b^2c - a^2d)]) / (b^4g^2) - (2B^2d^2(b^2c - a^2d)i^3 \text{Log}[a + bx] * \text{Log}[(b(c + dx))/(b^2c - a^2d)]) / (b^4g^2) - (a^2B^2d^3i^3 \text{PolyLog}[2, -((d(a + bx))/(b^2c - a^2d))]) / (b^4g^2) + (2aB^2d^2(3bc - 2ad)i^3 \text{PolyLog}[2, -((d(a + bx))/(b^2c - a^2d))]) / (b^4g^2) + (6ABd^2(b^2c - a^2d)i^3 \text{PolyLog}[2, -((d(a + bx))/(b^2c - a^2d))]) / (b^4g^2) - (2B^2d^2(b^2c - a^2d)i^3 \text{PolyLog}[2, -((d(a + bx))/(b^2c - a^2d))]) / (b^4g^2) - (B^2c^2d^2i^3 \text{PolyLog}[2, (b(c + dx))/(b^2c - a^2d)]) / (b^2g^2) + (2B^2c^2d^2(3bc - 2ad)i^3 \text{PolyLog}[2, (b(c + dx))/(b^2c - a^2d)]) / (b^3g^2) - (2B^2d^2(b^2c - a^2d)i^3 \text{PolyLog}[2, (b(c + dx))/(b^2c - a^2d)]) / (b^4g^2) + (6B^2d^2(b^2c - a^2d)i^3 \text{Log}[(e(a + bx))/(c + dx)] * \text{PolyLog}[2, 1 + (b^2c - a^2d)/(d(a + bx))]) / (b^4g^2) + (6B^2d^2(b^2c - a^2d)i^3 \text{PolyLog}[3, 1 + (b^2c - a^2d)/(d(a + bx))]) / (b^4g^2)
\end{aligned}$$

### Rule 2528

$\text{Int}[(a_.) + \text{Log}[(c_.)(\text{RFX}_.)^{(p_.)}](b_.)^{(n_.)}(\text{RGx}_.), x\_Symbol] \text{ :> With} \\
\{ \{u = \text{ExpandIntegrand}[(a + b \text{Log}[c \text{RFX}^p])^n, \text{RGx}, x] \}, \text{Int}[u, x] /; \text{SumQ}[u] \\
/; \text{FreeQ}\{a, b, c, p\}, x\} \&\& \text{RationalFunctionQ}[\text{RFX}, x] \&\& \text{RationalFunctionQ}[\text{RGx}, x]$

onQ[RGx, x] && IGtQ[n, 0]

### Rule 2523

Int[((a\_.) + Log[(c\_.)\*(Rfx\_)^(p\_.)]\*(b\_.))^(n\_.), x\_Symbol] := Simp[x\*(a + b\*Log[c\*Rfx^p])^n, x] - Dist[b\*n\*p, Int[SimplifyIntegrand[(x\*(a + b\*Log[c\*Rfx^p])^(n - 1)\*D[Rfx, x])/Rfx, x], x] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]

### Rule 12

Int[(a\_)\*(u\_), x\_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b\_)\*(v\_)] /; FreeQ[b, x]

### Rule 2524

Int[((a\_.) + Log[(c\_.)\*(Rfx\_)^(p\_.)]\*(b\_.))^(n\_.)/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[d + e\*x]\*(a + b\*Log[c\*Rfx^p])^n)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[d + e\*x]\*(a + b\*Log[c\*Rfx^p])^(n - 1)\*D[Rfx, x])/Rfx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]

### Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*(Rfx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n])^p, Rfx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[Rfx, x] && IntegerQ[p]

### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.)\*(x\_))^(q\_.), x\_Symbol] := Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] := Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x)

, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] := -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rule 2525

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*((d\_.) + (e\_.)\*(x\_))^(m\_.), x\_Symbol] := Simp[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^n)/(e\*(m + 1)), x] - Dist[(b\*n\*p)/(e\*(m + 1)), Int[SimplifyIntegrand[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

### Rule 2486

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.), x\_Symbol] := Simp[((a + b\*x)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/b, x] + Dist[(q\*r\*s\*(b\*c - a\*d))/b, Int[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1)/(c + d\*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]

### Rule 31

Int[((a\_) + (b\_.)\*(x\_))^(n\_.), x\_Symbol] := Simp[Log[RemoveContent[a + b\*x, x]]/b, x] /; FreeQ[{a, b}, x]

### Rule 44

Int[((a\_) + (b\_.)\*(x\_))^(m\_.)\*((c\_.) + (d\_.)\*(x\_))^(n\_.), x\_Symbol] := Int[ExpandIntegrand[(a + b\*x)^m\*(c + d\*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b\*c - a\*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])

### Rule 6688

```
Int[u_, x_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifyIntegrandQ[v, u, x]]
```

### Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]
```

### Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] := Dist[1/e, Subst[Int[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

### Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_Symbol] := Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]
```

### Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol] := Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e, Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]
```

### Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_Symbol] := With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g + h*x)^t]^u)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s + 1))/(p*r*(s + 1)*(b*c - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[s, -1]
```

### Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] := -Simp[(Log[-((b*c - a*d)/
```

```
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s - 1)/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ[b*g - a*h, 0] && IGtQ[s, 0]
```

### Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))^r_.]^s_.*(u_), x_Symbol] := With[{g = Simplify[((v - 1)*(c + d*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s - 1)/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

### Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] := With[{w = DerivativeDivides[v, u*v, x]}, Simp[w*PolyLog[n + 1, v], x] /; !FalseQ[w]] /; FreeQ[n, x]
```

### Rubi steps

$$\begin{aligned}
\int \frac{(79c + 79dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(ag + bgx)^2} dx &= \int \left( \frac{493039d^2(3bc - 2ad) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3g^2} + \frac{493039d^3x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^2g^2} \right) dx \\
&= \frac{(493039d^3) \int x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{b^2g^2} + \frac{(493039d^2(3bc - 2ad)) \int \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{b^3g^2} \\
&= \frac{493039d^2(3bc - 2ad)x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3g^2} + \frac{493039d^3x^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{2b^2g^2} \\
&= \frac{493039d^2(3bc - 2ad)x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3g^2} + \frac{493039d^3x^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{2b^2g^2} \\
&= \frac{493039d^2(3bc - 2ad)x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3g^2} + \frac{493039d^3x^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{2b^2g^2} \\
&= \frac{493039d^2(3bc - 2ad)x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3g^2} + \frac{493039d^3x^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{2b^2g^2} \\
&= -\frac{493039ABd^2(bc - ad)x}{b^3g^2} - \frac{986078B(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^4g^2(a + bx)} - \frac{493039d^3x^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{2b^2g^2} \\
&= -\frac{493039ABd^2(bc - ad)x}{b^3g^2} - \frac{493039B^2d^2(bc - ad)(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^4g^2} - \frac{493039d^3x^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{2b^2g^2} \\
&= -\frac{493039ABd^2(bc - ad)x}{b^3g^2} - \frac{493039B^2d^2(bc - ad)(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^4g^2} - \frac{1493039d^3x^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{2b^2g^2} \\
&= -\frac{493039ABd^2(bc - ad)x}{b^3g^2} - \frac{986078B^2(bc - ad)^3}{b^4g^2(a + bx)} - \frac{986078B^2d(bc - ad)^2 \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^4g^2} \\
&= -\frac{493039ABd^2(bc - ad)x}{b^3g^2} - \frac{986078B^2(bc - ad)^3}{b^4g^2(a + bx)} - \frac{986078B^2d(bc - ad)^2 \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^4g^2} \\
&= -\frac{493039ABd^2(bc - ad)x}{b^3g^2} - \frac{986078B^2(bc - ad)^3}{b^4g^2(a + bx)} - \frac{986078B^2d(bc - ad)^2 \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^4g^2} \\
&= -\frac{493039ABd^2(bc - ad)x}{b^3g^2} - \frac{986078B^2(bc - ad)^3}{b^4g^2(a + bx)} - \frac{986078B^2d(bc - ad)^2 \log \left( \frac{e(a+bx)}{c+dx} \right)}{b^4g^2}
\end{aligned}$$



**Mathematica [B]** time = 17.1514, size = 5108, normalized size = 7.38

Result too large to show

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2)/(a\*g + b\*g\*x)^2,x]

[Out] Result too large to show

**Maple [F]** time = 3.813, size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3}{(bgx + ag)^2} \left( A + B \ln \left( \frac{e(bx + a)}{dx + c} \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*i\*x+c\*i)^3\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^2,x)

[Out] int((d\*i\*x+c\*i)^3\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^2,x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^2,x, algorithm="maxima")

[Out]  $-3*A^2*(a^2/(b^4*g^2*x + a*b^3*g^2) - x/(b^2*g^2) + 2*a*\log(b*x + a)/(b^3*g^2))*c*d^2*i^3 + 1/2*(2*a^3/(b^5*g^2*x + a*b^4*g^2) + 6*a^2*\log(b*x + a)/(b^4*g^2) + (b*x^2 - 4*a*x)/(b^3*g^2))*A^2*d^3*i^3 + 3*A^2*c^2*d*i^3*(a/(b^3*g^2*x + a*b^2*g^2) + \log(b*x + a)/(b^2*g^2)) - 2*A*B*c^3*i^3*(\log(b*e*x/(d*x + c) + a*e/(d*x + c)))/(b^2*g^2*x + a*b*g^2) + 1/(b^2*g^2*x + a*b*g^2) + d*\log(b*x + a)/((b^2*c - a*b*d)*g^2) - d*\log(d*x + c)/((b^2*c - a*b*d)*g^2) - A^2*c^3*i^3/(b^2*g^2*x + a*b*g^2) + 1/2*(B^2*b^3*d^3*i^3*x^3 + 3*(2*b^3*$

```

c*d^2*i^3 - a*b^2*d^3*i^3)*B^2*x^2 + 2*(3*a*b^2*c*d^2*i^3 - 2*a^2*b*d^3*i^3
)*B^2*x - 2*(b^3*c^3*i^3 - 3*a*b^2*c^2*d*i^3 + 3*a^2*b*c*d^2*i^3 - a^3*d^3*
i^3)*B^2 + 6*((b^3*c^2*d*i^3 - 2*a*b^2*c*d^2*i^3 + a^2*b*d^3*i^3)*B^2*x + (
a*b^2*c^2*d*i^3 - 2*a^2*b*c*d^2*i^3 + a^3*d^3*i^3)*B^2)*log(b*x + a))*log(d
*x + c)^2/(b^5*g^2*x + a*b^4*g^2) - integrate(-(B^2*b^4*c^4*i^3*log(e)^2 +
(B^2*b^4*d^4*i^3*log(e)^2 + 2*A*B*b^4*d^4*i^3*log(e))*x^4 + 4*(B^2*b^4*c*d^
3*i^3*log(e)^2 + 2*A*B*b^4*c*d^3*i^3*log(e))*x^3 + 6*(B^2*b^4*c^2*d^2*i^3*l
og(e)^2 + 2*A*B*b^4*c^2*d^2*i^3*log(e))*x^2 + (B^2*b^4*d^4*i^3*x^4 + 4*B^2*
b^4*c*d^3*i^3*x^3 + 6*B^2*b^4*c^2*d^2*i^3*x^2 + 4*B^2*b^4*c^3*d*i^3*x + B^2
*b^4*c^4*i^3)*log(b*x + a)^2 + 2*(2*B^2*b^4*c^3*d*i^3*log(e)^2 + 3*A*B*b^4*
c^3*d*i^3*log(e))*x + 2*(B^2*b^4*c^4*i^3*log(e) + (B^2*b^4*d^4*i^3*log(e) +
A*B*b^4*d^4*i^3)*x^4 + 4*(B^2*b^4*c*d^3*i^3*log(e) + A*B*b^4*c*d^3*i^3)*x^
3 + 6*(B^2*b^4*c^2*d^2*i^3*log(e) + A*B*b^4*c^2*d^2*i^3)*x^2 + (4*B^2*b^4*c
^3*d*i^3*log(e) + 3*A*B*b^4*c^3*d*i^3)*x)*log(b*x + a) - ((2*A*B*b^4*d^4*i^
3 + (2*i^3*log(e) + i^3)*B^2*b^4*d^4)*x^4 + 2*(4*A*B*b^4*c*d^3*i^3 - (a*b^3
*d^4*i^3 - (4*i^3*log(e) + 3*i^3)*b^4*c*d^3)*B^2)*x^3 + 2*(b^4*c^4*i^3*log(
e) - a*b^3*c^3*d*i^3 + 3*a^2*b^2*c^2*d^2*i^3 - 3*a^3*b*c*d^3*i^3 + a^4*d^4*
i^3)*B^2 + (12*A*B*b^4*c^2*d^2*i^3 + (12*b^4*c^2*d^2*i^3*log(e) + 12*a*b^3*
c*d^3*i^3 - 7*a^2*b^2*d^4*i^3)*B^2)*x^2 + 2*(3*A*B*b^4*c^3*d*i^3 + (3*a*b^3
*c^2*d^2*i^3 - a^3*b*d^4*i^3 + (4*i^3*log(e) - i^3)*b^4*c^3*d)*B^2)*x + 2*(
B^2*b^4*d^4*i^3*x^4 + 4*B^2*b^4*c*d^3*i^3*x^3 + 3*(3*b^4*c^2*d^2*i^3 - 2*a*
b^3*c*d^3*i^3 + a^2*b^2*d^4*i^3)*B^2*x^2 + 2*(2*b^4*c^3*d*i^3 + 3*a*b^3*c^2
*d^2*i^3 - 6*a^2*b^2*c*d^3*i^3 + 3*a^3*b*d^4*i^3)*B^2*x + (b^4*c^4*i^3 + 3*
a^2*b^2*c^2*d^2*i^3 - 6*a^3*b*c*d^3*i^3 + 3*a^4*d^4*i^3)*B^2)*log(b*x + a)
)*log(d*x + c))/(b^6*d*g^2*x^3 + a^2*b^4*c*g^2 + (b^6*c*g^2 + 2*a*b^5*d*g^2)
*x^2 + (2*a*b^5*c*g^2 + a^2*b^4*d*g^2)*x), x)

```

---

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{A^2 d^3 i^3 x^3 + 3 A^2 c d^2 i^3 x^2 + 3 A^2 c^2 d i^3 x + A^2 c^3 i^3 + (B^2 d^3 i^3 x^3 + 3 B^2 c d^2 i^3 x^2 + 3 B^2 c^2 d i^3 x + B^2 c^3 i^3) \log\left(\frac{bex+ae}{dx+c}\right)^2}{b^2 g^2 x^2 + 2 a b g^2 x + a^2 g^2} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^2,x, algorithm="fricas")

[Out] integral((A^2\*d^3\*i^3\*x^3 + 3\*A^2\*c\*d^2\*i^3\*x^2 + 3\*A^2\*c^2\*d\*i^3\*x + A^2\*c^3\*i^3 + (B^2\*d^3\*i^3\*x^3 + 3\*B^2\*c\*d^2\*i^3\*x^2 + 3\*B^2\*c^2\*d\*i^3\*x + B^2\*c^3\*i^3)\*log((b\*e\*x + a\*e)/(d\*x + c))^2 + 2\*(A\*B\*d^3\*i^3\*x^3 + 3\*A\*B\*c\*d^2\*i^3\*x^2 + 3\*A\*B\*c^2\*d\*i^3\*x + A\*B\*c^3\*i^3)\*log((b\*e\*x + a\*e)/(d\*x + c)))/(b^

$2*g^2*x^2 + 2*a*b*g^2*x + a^2*g^2), x)$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*\*3\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))\*\*2/(b\*g\*x+a\*g)\*\*2,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3 \left( B \log \left( \frac{(bx+a)e}{dx+c} \right) + A \right)^2}{(bgx + ag)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^2,x, algorithm="giac")

[Out] integrate((d\*i\*x + c\*i)^3\*(B\*log((b\*x + a)\*e/(d\*x + c)) + A)^2/(b\*g\*x + a\*g)^2, x)

$$3.80 \quad \int \frac{(ci+dx)^3 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)^2}{(ag+bgx)^3} dx$$

**Optimal.** Leaf size=604

$$\frac{6Bd^2i^3(bc-ad)\text{PolyLog}\left(2, \frac{b(c+dx)}{d(a+bx)}\right)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{b^4g^3} + \frac{2B^2d^2i^3(bc-ad)\text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)}{b^4g^3} + \frac{6B^2d^2i^3(bc-ad)\text{PolyLog}\left(3, \frac{b(c+dx)}{d(a+bx)}\right)}{b^4g^3}$$

[Out]  $(-4*B^2*d*(b*c - a*d)*i^3*(c + d*x))/(b^3*g^3*(a + b*x)) - (B^2*(b*c - a*d)*i^3*(c + d*x)^2)/(4*b^2*g^3*(a + b*x)^2) - (4*B*d*(b*c - a*d)*i^3*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x]))/(b^3*g^3*(a + b*x)) - (B*(b*c - a*d)*i^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x]))/(2*b^2*g^3*(a + b*x)^2) + (2*B*d^2*(b*c - a*d)*i^3*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x]))/(b^4*g^3) + (d^3*i^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x]))^2)/(b^4*g^3) - (2*d*(b*c - a*d)*i^3*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x]))^2)/(b^3*g^3*(a + b*x)) - ((b*c - a*d)*i^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x]))^2)/(2*b^2*g^3*(a + b*x)^2) - (3*d^2*(b*c - a*d)*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x]))^2*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^3) + (2*B^2*d^2*(b*c - a*d)*i^3*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b^4*g^3) + (6*B*d^2*(b*c - a*d)*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^3) + (6*B^2*d^2*(b*c - a*d)*i^3*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^3)$

**Rubi [B]** time = 4.9264, antiderivative size = 1412, normalized size of antiderivative = 2.34, number of steps used = 95, number of rules used = 21, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.5$ , Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 44, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610}

$$-\frac{aB^2d^3 \log^2(a+bx)i^3}{b^4g^3} + \frac{5B^2d^2(bc-ad) \log^2(a+bx)i^3}{2b^4g^3} - \frac{3ABd^2(bc-ad) \log^2(a+bx)i^3}{b^4g^3} - \frac{3B^2d^2(bc-ad) \log\left(-\frac{bc-ad}{d(a+bx)}\right)}{b^4g^3}$$

Antiderivative was successfully verified.

[In] Int[((c\*i + d\*i\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))^2)/(a\*g + b\*g\*x)^3, x]

[Out]  $(-B^2*(b*c - a*d)^3*i^3)/(4*b^4*g^3*(a + b*x)^2) - (9*B^2*d*(b*c - a*d)^2*i^3)/(2*b^4*g^3*(a + b*x)) - (9*B^2*d^2*(b*c - a*d)*i^3*Log[a + b*x])/(2*b^4$

$$\begin{aligned}
& *g^3) - (a*B^2*d^3*i^3*Log[a + b*x]^2)/(b^4*g^3) - (3*A*B*d^2*(b*c - a*d)*i^3*Log[a + b*x]^2)/(b^4*g^3) + (5*B^2*d^2*(b*c - a*d)*i^3*Log[a + b*x]^2)/(2*b^4*g^3) - (3*B^2*d^2*(b*c - a*d)*i^3*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a + b*x))/(c + d*x)]^2)/(b^4*g^3) - (3*B^2*d^2*(b*c - a*d)*i^3*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)]^2)/(b^4*g^3) - (B*(b*c - a*d)^3*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*b^4*g^3*(a + b*x)^2) - (5*B*d*(b*c - a*d)^2*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^4*g^3*(a + b*x)) + (2*a*B*d^3*i^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^4*g^3) - (5*B*d^2*(b*c - a*d)*i^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^4*g^3) + (d^3*i^3*x*(A + B*Log[(e*(a + b*x))/(c + d*x)]^2)/(b^3*g^3) - ((b*c - a*d)^3*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]^2)/(2*b^4*g^3*(a + b*x)^2) - (3*d*(b*c - a*d)^2*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]^2)/(b^4*g^3*(a + b*x)) + (3*d^2*(b*c - a*d)*i^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]^2)/(b^4*g^3) + (9*B^2*d^2*(b*c - a*d)*i^3*Log[c + d*x])/(2*b^4*g^3) + (2*B^2*c*d^2*i^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b^3*g^3) - (5*B^2*d^2*(b*c - a*d)*i^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b^4*g^3) - (2*B*c*d^2*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(b^3*g^3) + (5*B*d^2*(b*c - a*d)*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(b^4*g^3) - (B^2*c*d^2*i^3*Log[c + d*x]^2)/(b^3*g^3) + (5*B^2*d^2*(b*c - a*d)*i^3*Log[c + d*x]^2)/(2*b^4*g^3) + (2*a*B^2*d^3*i^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)]/(b^4*g^3) + (6*A*B*d^2*(b*c - a*d)*i^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)]/(b^4*g^3) - (5*B^2*d^2*(b*c - a*d)*i^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)]/(b^4*g^3) + (2*a*B^2*d^3*i^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))]/(b^4*g^3) + (6*A*B*d^2*(b*c - a*d)*i^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))]/(b^4*g^3) - (5*B^2*d^2*(b*c - a*d)*i^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))]/(b^4*g^3) + (2*B^2*c*d^2*i^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]/(b^3*g^3) - (5*B^2*d^2*(b*c - a*d)*i^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]/(b^4*g^3) + (6*B^2*d^2*(b*c - a*d)*i^3*Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))]/(b^4*g^3) + (6*B^2*d^2*(b*c - a*d)*i^3*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))]/(b^4*g^3)
\end{aligned}$$

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

```

### Rule 2523

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] := Simp[x*(a + b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFX^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFX_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFX, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFX, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x
), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
```

$(e*f - d*g), 0]$

### Rule 2391

$\text{Int}[\text{Log}[(c\_.) * ((d\_.) + (e\_.) * (x\_.)^{(n\_.)})] / (x\_.), x\_Symbol] \text{ :> } -\text{Simp}[\text{PolyLog}[2, -(c * e * x^n)] / n, x] \text{ /; FreeQ}\{c, d, e, n, x\} \ \&\& \ \text{EqQ}[c * d, 1]$

### Rule 2525

$\text{Int}[(a\_.) + \text{Log}[(c\_.) * (\text{RFX}\_.)^{(p\_.)}] * (b\_.)^{(n\_.)} * ((d\_.) + (e\_.) * (x\_.)^{(m\_.)}), x\_Symbol] \text{ :> } \text{Simp}[(d + e * x)^{(m + 1)} * (a + b * \text{Log}[c * \text{RFX}^p])^n / (e * (m + 1)), x] - \text{Dist}[(b * n * p) / (e * (m + 1)), \text{Int}[\text{SimplifyIntegrand}[(d + e * x)^{(m + 1)} * (a + b * \text{Log}[c * \text{RFX}^p])^{(n - 1)} * D[\text{RFX}, x]) / \text{RFX}, x], x], x] \text{ /; FreeQ}\{a, b, c, d, e, m, p\}, x\} \ \&\& \ \text{RationalFunctionQ}[\text{RFX}, x] \ \&\& \ \text{IGtQ}[n, 0] \ \&\& \ (\text{EqQ}[n, 1] \ || \ \text{IntegerQ}[m]) \ \&\& \ \text{NeQ}[m, -1]$

### Rule 44

$\text{Int}[(a\_.) + (b\_.) * (x\_.)^{(m\_.)} * ((c\_.) + (d\_.) * (x\_.)^{(n\_.)}), x\_Symbol] \text{ :> } \text{Int}[\text{ExpandIntegrand}[(a + b * x)^m * (c + d * x)^n, x], x] \text{ /; FreeQ}\{a, b, c, d\}, x\} \ \&\& \ \text{NeQ}[b * c - a * d, 0] \ \&\& \ \text{ILtQ}[m, 0] \ \&\& \ \text{IntegerQ}[n] \ \&\& \ !(\text{IGtQ}[n, 0] \ \&\& \ \text{LtQ}[m + n + 2, 0])$

### Rule 6688

$\text{Int}[u\_., x\_Symbol] \text{ :> } \text{With}\{v = \text{SimplifyIntegrand}[u, x]\}, \text{Int}[v, x] \text{ /; SimplifyIntegrandQ}[v, u, x]$

### Rule 6742

$\text{Int}[u\_., x\_Symbol] \text{ :> } \text{With}\{v = \text{ExpandIntegrand}[u, x]\}, \text{Int}[v, x] \text{ /; SumQ}[v]$

### Rule 2411

$\text{Int}[(a\_.) + \text{Log}[(c\_.) * ((d\_.) + (e\_.) * (x\_.)^{(n\_.)})] * (b\_.)^{(p\_.)} * ((f\_.) + (g\_.) * (x\_.)^{(q\_.)} * ((h\_.) + (i\_.) * (x\_.)^{(r\_.)}), x\_Symbol] \text{ :> } \text{Dist}[1/e, \text{Subst}[\text{Int}[(g * x / e)^q * (e * h - d * i) / e + (i * x / e)^r * (a + b * \text{Log}[c * x^n])^p, x], x, d + e * x], x] \text{ /; FreeQ}\{a, b, c, d, e, f, g, h, i, n, p, q, r\}, x\} \ \&\& \ \text{EqQ}[e * f - d * g, 0] \ \&\& \ (\text{IGtQ}[p, 0] \ || \ \text{IGtQ}[r, 0]) \ \&\& \ \text{IntegerQ}[2 * r]$

### Rule 2344

$\text{Int}[(a\_.) + \text{Log}[(c\_.) * (x\_.)^{(n\_.)}] * (b\_.)^{(p\_.)} / ((x\_.) * ((d\_.) + (e\_.) * (x\_.)^{(m\_.)})), x\_Symbol] \text{ :> } \text{Dist}[1/d, \text{Int}[(a + b * \text{Log}[c * x^n])^p / x, x], x] - \text{Dist}[e/d, \text{Int}[(a + b * \text{Log}[c * x^n])^p, x], x]$

$(a + b \cdot \log[c \cdot x^n])^p / (d + e \cdot x), x, x$  /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

### Rule 2317

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^p)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

### Rule 2507

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.)\*Log[(i\_.)\*((j\_.)\*((g\_.) + (h\_.)\*(x\_))^(t\_.))^(u\_.)]\*(v\_), x\_Symbol] := With[{k = Simplify[v\*(a + b\*x)\*(c + d\*x)]}, Simp[(k\*Log[i\*(j\*(g + h\*x)^t]^u)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s + 1))/(p\*r\*(s + 1)\*(b\*c - a\*d)), x] - Dist[(k\*h\*t\*u)/(p\*r\*(s + 1)\*(b\*c - a\*d)), Int[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s + 1)/(g + h\*x), x], x] /; FreeQ[k, x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && NeQ[s, -1]

### Rule 2488

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.)/((g\_.) + (h\_.)\*(x\_)), x\_Symbol] := -Simp[(Log[-((b\*c - a\*d)/(d\*(a + b\*x)))]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/h, x] + Dist[(p\*r\*s\*(b\*c - a\*d))/h, Int[(Log[-((b\*c - a\*d)/(d\*(a + b\*x)))]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1))/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && EqQ[b\*g - a\*h, 0] && IGtQ[s, 0]

### Rule 2506

Int[Log[v\_]\*Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.)\*(u\_), x\_Symbol] := With[{g = Simplify[((v - 1)\*(c + d\*x))/(a + b\*x)], h = Simplify[u\*(a + b\*x)\*(c + d\*x)]}, -Simp[(h\*PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/(b\*c - a\*d), x] + Dist[h\*p\*r\*s, Int[(PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1))/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]

### Rule 6610

Int[(u\_)\*PolyLog[n\_, v\_], x\_Symbol] := With[{w = DerivativeDivides[v, u\*v, x]}, Simp[w\*PolyLog[n + 1, v], x] /; !FalseQ[w] /; FreeQ[n, x]



Rubi steps

$$\begin{aligned}
\int \frac{(80c + 80dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(ag + bgx)^3} dx &= \int \left( \frac{512000d^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3g^3} + \frac{512000(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3g^3(a + bx)^3} \right) dx \\
&= \frac{(512000d^3) \int \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{b^3g^3} + \frac{(1536000d^2(bc - ad)) \int \frac{(A+B \log \left( \frac{e(a+bx)}{c+dx} \right))}{a+bx} dx}{b^3g^3} \\
&= \frac{512000d^3x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3g^3} - \frac{256000(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^4g^3(a + bx)^2} \\
&= \frac{512000d^3x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3g^3} - \frac{256000(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^4g^3(a + bx)^2} \\
&= \frac{512000d^3x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3g^3} - \frac{256000(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^4g^3(a + bx)^2} \\
&= \frac{512000d^3x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3g^3} - \frac{256000(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^4g^3(a + bx)^2} \\
&= -\frac{256000B(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^4g^3(a + bx)^2} - \frac{2560000Bd(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^4g^3(a + bx)} \\
&= -\frac{256000B(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^4g^3(a + bx)^2} - \frac{2560000Bd(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^4g^3(a + bx)} \\
&= -\frac{1536000B^2d^2(bc - ad) \log(a + bx) \log^2 \left( \frac{e(a+bx)}{c+dx} \right)}{b^4g^3} - \frac{256000B(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^4g^3(a + bx)} \\
&= -\frac{128000B^2(bc - ad)^3}{b^4g^3(a + bx)^2} - \frac{2304000B^2d(bc - ad)^2}{b^4g^3(a + bx)} - \frac{2304000B^2d^2(bc - ad) \log(a + bx)}{b^4g^3} \\
&= -\frac{128000B^2(bc - ad)^3}{b^4g^3(a + bx)^2} - \frac{2304000B^2d(bc - ad)^2}{b^4g^3(a + bx)} - \frac{2304000B^2d^2(bc - ad) \log(a + bx)}{b^4g^3} \\
&= -\frac{128000B^2(bc - ad)^3}{b^4g^3(a + bx)^2} - \frac{2304000B^2d(bc - ad)^2}{b^4g^3(a + bx)} - \frac{2304000B^2d^2(bc - ad) \log(a + bx)}{b^4g^3} \\
&= -\frac{128000B^2(bc - ad)^3}{b^4g^3(a + bx)^2} - \frac{2304000B^2d(bc - ad)^2}{b^4g^3(a + bx)} - \frac{2304000B^2d^2(bc - ad) \log(a + bx)}{b^4g^3}
\end{aligned}$$

**Mathematica [B]** time = 14.995, size = 6284, normalized size = 10.4

Result too large to show

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2)/(a\*g + b\*g\*x)^3,x]

[Out] Result too large to show

**Maple [F]** time = 3.958, size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3}{(bgx + ag)^3} \left( A + B \ln \left( \frac{e(bx + a)}{dx + c} \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*i\*x+c\*i)^3\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^3,x)

[Out] int((d\*i\*x+c\*i)^3\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^3,x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^3,x, algorithm="maxima")

[Out] 
$$-3/2*A*B*c^2*d*i^3*(2*(2*b*x + a)*\log(b*e*x/(d*x + c) + a*e/(d*x + c)))/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) + (3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*d)*x)/((b^5*c - a*b^4*d)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)*g^3) + 2*(2*b*c*d - a*d^2)*\log(b*x + a)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3) - 2*(2*b*c*d - a*d^2)*\log(d*x + c)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3) - 1/2*A^2*d^3*i^3*((6*a^2*b*x + 5*a^3)/(b^6*g^3*x^2 + 2*a*b^5*g^3*x + a^2*b^4*g^3) - 2*x/(b^3*g^3) + 6*a*\log(b*x + a))$$

$$\begin{aligned}
& / (b^4 g^3) + 3/2 A^2 c d^2 i^3 ((4 a b x + 3 a^2) / (b^5 g^3 x^2 + 2 a b^4 g^3 x + a^2 b^3 g^3) + 2 \log(b x + a) / (b^3 g^3)) + 1/2 A B c^3 i^3 ((2 b d x - b c + 3 a d) / ((b^4 c - a b^3 d) g^3 x^2 + 2 (a b^3 c - a^2 b^2 d) g^3 x + (a^2 b^2 c - a^3 b d) g^3) - 2 \log(b e x / (d x + c) + a e / (d x + c)) / (b^3 g^3 x^2 + 2 a b^2 g^3 x + a^2 b g^3) + 2 d^2 \log(b x + a) / ((b^3 c^2 - 2 a b^2 c d + a^2 b d^2) g^3) - 2 d^2 \log(d x + c) / ((b^3 c^2 - 2 a b^2 c d + a^2 b d^2) g^3)) - 3/2 (2 b x + a) A^2 c^2 d i^3 / (b^4 g^3 x^2 + 2 a b^3 g^3 x + a^2 b^2 g^3) - 1/2 A^2 c^3 i^3 / (b^3 g^3 x^2 + 2 a b^2 g^3 x + a^2 b g^3) + 1/2 (2 B^2 b^3 d^3 i^3 x^3 + 4 B^2 a b^2 d^3 i^3 x^2 - 2 (3 b^3 c^2 d i^3 - 6 a b^2 c d^2 i^3 + 2 a^2 b d^3 i^3) B^2 x - (b^3 c^3 i^3 + 3 a b^2 c^2 d i^3 - 9 a^2 b c d^2 i^3 + 5 a^3 d^3 i^3) B^2 + 6 ((b^3 c d^2 i^3 - a b^2 d^3 i^3) B^2 x^2 + 2 (a b^2 c d^2 i^3 - a^2 b d^3 i^3) B^2 x + (a^2 b c d^2 i^3 - a^3 d^3 i^3) B^2) \log(b x + a) \log(d x + c)^2 / (b^6 g^3 x^2 + 2 a b^5 g^3 x + a^2 b^4 g^3) - \text{integrate}(- (4 B^2 b^4 c^3 d i^3 x \log(e)^2 + B^2 b^4 c^4 i^3 \log(e)^2 + (B^2 b^4 d^4 i^3 \log(e)^2 + 2 A B b^4 d^4 i^3 \log(e)) x^4 + 4 (B^2 b^4 c d^3 i^3 \log(e)^2 + 2 A B b^4 c d^3 i^3 \log(e)) x^3 + 6 (B^2 b^4 c^2 d^2 i^3 \log(e)^2 + A B b^4 c^2 d^2 i^3 \log(e)) x^2 + (B^2 b^4 d^4 i^3 x^4 + 4 B^2 b^4 c d^3 i^3 x^3 + 6 B^2 b^4 c^2 d^2 i^3 x^2 + 4 B^2 b^4 c^3 d i^3 x + B^2 b^4 c^4 i^3) \log(b x + a)^2 + 2 (4 B^2 b^4 c^3 d i^3 x \log(e) + B^2 b^4 c^4 i^3 \log(e) + (B^2 b^4 d^4 i^3 \log(e) + A B b^4 d^4 i^3) x^4 + 4 (B^2 b^4 c d^3 i^3 \log(e) + A B b^4 c d^3 i^3) x^3 + 3 (2 B^2 b^4 c^2 d^2 i^3 \log(e) + A B b^4 c^2 d^2 i^3) x^2) \log(b x + a) - (2 (A B b^4 d^4 i^3 + (i^3 \log(e) + i^3) B^2 b^4 d^4) x^4 - (9 a b^3 c^2 d^2 i^3 - 21 a^2 b^2 c d^3 i^3 + 9 a^3 b d^4 i^3 - (8 i^3 \log(e) - i^3) b^4 c^3 d) B^2 x + 2 (4 A B b^4 c d^3 i^3 + (4 b^4 c d^3 i^3 \log(e) + 3 a b^3 d^4 i^3) B^2) x^3 + (2 b^4 c^4 i^3 \log(e) - a b^3 c^3 d i^3 - 3 a^2 b^2 c^2 d^2 i^3 + 9 a^3 b c d^3 i^3 - 5 a^4 d^4 i^3) B^2 + 6 (A B b^4 c^2 d^2 i^3 + (2 a b^3 c d^3 i^3 + (2 i^3 \log(e) - i^3) b^4 c^2 d^2) B^2) x^2 + 2 (B^2 b^4 d^4 i^3 x^4 + (7 b^4 c d^3 i^3 - 3 a b^3 d^4 i^3) B^2 x^3 + 3 (2 b^4 c^2 d^2 i^3 + 3 a b^3 c d^3 i^3 - 3 a^2 b^2 d^4 i^3) B^2 x^2 + (4 b^4 c^3 d i^3 + 9 a^2 b^2 c d^3 i^3 - 9 a^3 b d^4 i^3) B^2 x + (b^4 c^4 i^3 + 3 a^3 b c d^3 i^3 - 3 a^4 d^4 i^3) B^2) \log(b x + a) \log(d x + c)) / (b^7 d g^3 x^4 + a^3 b^4 c g^3 + (b^7 c g^3 + 3 a b^6 d g^3) x^3 + 3 (a b^6 c g^3 + a^2 b^5 d g^3) x^2 + (3 a^2 b^5 c g^3 + a^3 b^4 d g^3) x), x)
\end{aligned}$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{A^2 d^3 i^3 x^3 + 3 A^2 c d^2 i^3 x^2 + 3 A^2 c^2 d i^3 x + A^2 c^3 i^3 + (B^2 d^3 i^3 x^3 + 3 B^2 c d^2 i^3 x^2 + 3 B^2 c^2 d i^3 x + B^2 c^3 i^3) \log\left(\frac{bex+ae}{dx+c}\right)^2}{b^3 g^3 x^3 + 3 a b^2 g^3 x^2 + 3 a^2 b g^3 x + a^3 g^3} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x, algorithm="fricas")
```

```
[Out] integral((A^2*d^3*i^3*x^3 + 3*A^2*c*d^2*i^3*x^2 + 3*A^2*c^2*d*i^3*x + A^2*c^3*i^3 + (B^2*d^3*i^3*x^3 + 3*B^2*c*d^2*i^3*x^2 + 3*B^2*c^2*d*i^3*x + B^2*c^3*i^3)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*d^3*i^3*x^3 + 3*A*B*c*d^2*i^3*x^2 + 3*A*B*c^2*d*i^3*x + A*B*c^3*i^3)*log((b*e*x + a*e)/(d*x + c)))/(b^3*g^3*x^3 + 3*a*b^2*g^3*x^2 + 3*a^2*b*g^3*x + a^3*g^3), x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**3,x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3 \left( B \log\left(\frac{bx+ae}{dx+c}\right) + A \right)^2}{(bgx + ag)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x, algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g)^3, x)
```

$$3.81 \quad \int \frac{(ci+dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(ag+bgx)^5} dx$$

**Optimal.** Leaf size=147

$$-\frac{i^3(c+dx)^4 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)^2}{4g^5(a+bx)^4(bc-ad)} - \frac{Bi^3(c+dx)^4 \left( B \log \left( \frac{e(a+bx)}{c+dx} \right) + A \right)}{8g^5(a+bx)^4(bc-ad)} - \frac{B^2i^3(c+dx)^4}{32g^5(a+bx)^4(bc-ad)}$$

[Out]  $-(B^2i^3(c+dx)^4)/(32*(b*c-a*d)*g^5*(a+bx)^4) - (Bi^3(c+dx)^4*(A+B*Log[(e*(a+bx))/(c+dx)]))/(8*(b*c-a*d)*g^5*(a+bx)^4) - (i^3(c+dx)^4*(A+B*Log[(e*(a+bx))/(c+dx)])^2)/(4*(b*c-a*d)*g^5*(a+bx)^4)$

**Rubi [C]** time = 4.5405, antiderivative size = 970, normalized size of antiderivative = 6.6, number of steps used = 130, number of rules used = 11, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.262$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2i^3 \log^2(a+bx)d^4}{4b^4(bc-ad)g^5} + \frac{B^2i^3 \log^2(c+dx)d^4}{4b^4(bc-ad)g^5} - \frac{B^2i^3 \log(a+bx)d^4}{8b^4(bc-ad)g^5} - \frac{Bi^3 \log(a+bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right) d^4}{2b^4(bc-ad)g^5} + \frac{B^2i^3 \log(c+dx)d^4}{8b^4(bc-ad)g^5}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[(c*i + d*i*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(a*g + b*g*x)^5, x]$

[Out]  $-(B^2*(b*c-a*d)^3*i^3)/(32*b^4*g^5*(a+bx)^4) - (B^2*d*(b*c-a*d)^2*i^3)/(8*b^4*g^5*(a+bx)^3) - (3*B^2*d^2*(b*c-a*d)*i^3)/(16*b^4*g^5*(a+bx)^2) - (B^2*d^3*i^3)/(8*b^4*g^5*(a+bx)) - (B^2*d^4*i^3*Log[a+bx])/(8*b^4*(b*c-a*d)*g^5) + (B^2*d^4*i^3*Log[a+bx]^2)/(4*b^4*(b*c-a*d)*g^5) - (B*(b*c-a*d)^3*i^3*(A+B*Log[(e*(a+bx))/(c+d*x)]))/(8*b^4*g^5*(a+bx)^4) - (B*d*(b*c-a*d)^2*i^3*(A+B*Log[(e*(a+bx))/(c+d*x)]))/(2*b^4*g^5*(a+bx)^3) - (3*B*d^2*(b*c-a*d)*i^3*(A+B*Log[(e*(a+bx))/(c+d*x)]))/(4*b^4*g^5*(a+bx)^2) - (B*d^3*i^3*(A+B*Log[(e*(a+bx))/(c+d*x)]))/(2*b^4*g^5*(a+bx)) - (B*d^4*i^3*Log[a+bx]*(A+B*Log[(e*(a+bx))/(c+d*x)]))/(2*b^4*(b*c-a*d)*g^5) - ((b*c-a*d)^3*i^3*(A+B*Log[(e*(a+bx))/(c+d*x)])^2)/(4*b^4*g^5*(a+bx)^4) - (d*(b*c-a*d)^2*i^3*(A+B*Log[(e*(a+bx))/(c+d*x)])^2)/(b^4*g^5*(a+bx)^3) - (3*d^2*(b*c-a*d)*i^3*(A+B*Log[(e*(a+bx))/(c+d*x)])^2)/(2*b^4*g^5*(a+bx)^2) - (d^3*i^3*(A+B*Log[(e*(a+bx))/(c+d*x)])^2)/(b^4*g^5*(a+bx))$

```
*x)) + (B^2*d^4*i^3*Log[c + d*x])/(8*b^4*(b*c - a*d)*g^5) - (B^2*d^4*i^3*Lo
g[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(2*b^4*(b*c - a*d)*g^5) + (B*
d^4*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(2*b^4*(b*c - a*
d)*g^5) + (B^2*d^4*i^3*Log[c + d*x]^2)/(4*b^4*(b*c - a*d)*g^5) - (B^2*d^4*i
^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(2*b^4*(b*c - a*d)*g^5) - (
B^2*d^4*i^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(2*b^4*(b*c - a*d)*g^
5) - (B^2*d^4*i^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(2*b^4*(b*c - a*d)
*g^5)
```

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFX^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFX, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_.))^(m_.)*((c_.) + (d_.)*(x_.))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_.)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFX^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n]]^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x
), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps



$$\begin{aligned}
\int \frac{(81c + 81dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(ag + bgx)^5} dx &= \int \left( \frac{531441(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3 g^5 (a + bx)^5} + \frac{1594323d(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3 g^5 (a + bx)^5} \right) dx \\
&= \frac{(531441d^3) \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(a+bx)^2} dx}{b^3 g^5} + \frac{(1594323d^2(bc - ad)) \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(a+bx)^3} dx}{b^3 g^5} \\
&= -\frac{531441(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{4b^4 g^5 (a + bx)^4} - \frac{531441d(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^4 g^5 (a + bx)^3} \\
&= -\frac{531441(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{4b^4 g^5 (a + bx)^4} - \frac{531441d(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^4 g^5 (a + bx)^3} \\
&= -\frac{531441(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{4b^4 g^5 (a + bx)^4} - \frac{531441d(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^4 g^5 (a + bx)^3} \\
&= -\frac{531441(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{4b^4 g^5 (a + bx)^4} - \frac{531441d(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^4 g^5 (a + bx)^3} \\
&= -\frac{531441B(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{8b^4 g^5 (a + bx)^4} - \frac{531441Bd(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{2b^4 g^5 (a + bx)^3} \\
&= -\frac{531441B(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{8b^4 g^5 (a + bx)^4} - \frac{531441Bd(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{2b^4 g^5 (a + bx)^3} \\
&= -\frac{531441B(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{8b^4 g^5 (a + bx)^4} - \frac{531441Bd(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{2b^4 g^5 (a + bx)^3} \\
&= -\frac{531441B^2(bc - ad)^3}{32b^4 g^5 (a + bx)^4} - \frac{531441B^2d(bc - ad)^2}{8b^4 g^5 (a + bx)^3} - \frac{1594323B^2d^2(bc - ad)}{16b^4 g^5 (a + bx)^2} + \\
&= -\frac{531441B^2(bc - ad)^3}{32b^4 g^5 (a + bx)^4} - \frac{531441B^2d(bc - ad)^2}{8b^4 g^5 (a + bx)^3} - \frac{1594323B^2d^2(bc - ad)}{16b^4 g^5 (a + bx)^2} + \\
&= -\frac{531441B^2(bc - ad)^3}{32b^4 g^5 (a + bx)^4} - \frac{531441B^2d(bc - ad)^2}{8b^4 g^5 (a + bx)^3} - \frac{1594323B^2d^2(bc - ad)}{16b^4 g^5 (a + bx)^2} +
\end{aligned}$$

$$-\frac{531441B^2(bc - ad)^3}{32b^4 g^5 (a + bx)^4} - \frac{531441B^2d(bc - ad)^2}{8b^4 g^5 (a + bx)^3} - \frac{1594323B^2d^2(bc - ad)}{16b^4 g^5 (a + bx)^2} +$$

**Mathematica [C]** time = 1.54465, size = 2470, normalized size = 16.8

Result too large to show

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2)/(a\*g + b\*g\*x)^5,x]

[Out] 
$$-(i^3(8A^2b^4c^4 + 4Ab^4Bc^4 + b^4B^2c^4 - 8a^4A^2d^4 - 4a^4ABd^4 - a^4B^2d^4 + 32A^2b^4c^3d*x + 16Ab^4Bc^3d*x + 4b^4B^2c^3d*x - 32a^3A^2b^4d^4*x - 16a^3Ab^4Bd^4*x - 4a^3b^4B^2d^4*x + 48A^2b^4c^2d^2*x^2 + 24Ab^4Bc^2d^2*x^2 + 6b^4B^2c^2d^2*x^2 - 48a^2A^2b^2d^4*x^2 - 24a^2Ab^2Bd^4*x^2 - 6a^2b^2B^2d^4*x^2 + 32A^2b^4c^3d^3*x^3 + 16Ab^4Bc^3d^3*x^3 + 4b^4B^2c^3d^3*x^3 - 32a^3A^2b^3d^4*x^3 - 16a^3Ab^3Bd^4*x^3 - 4a^3b^3B^2d^4*x^3 + 16a^4ABd^4\text{Log}[a + b*x] + 4a^4B^2d^4\text{Log}[a + b*x] + 64a^3Ab^4d^4*x\text{Log}[a + b*x] + 16a^3b^4B^2d^4*x\text{Log}[a + b*x] + 96a^2A^2b^2Bd^4*x^2\text{Log}[a + b*x] + 24a^2b^2B^2d^4*x^2\text{Log}[a + b*x] + 64a^3Ab^3Bd^4*x^3\text{Log}[a + b*x] + 16a^3b^3B^2d^4*x^3\text{Log}[a + b*x] + 16Ab^4Bd^4*x^4\text{Log}[a + b*x] + 4b^4B^2d^4*x^4\text{Log}[a + b*x] - 8a^4B^2d^4\text{Log}[a + b*x]^2 - 32a^3b^4B^2d^4*x\text{Log}[a + b*x]^2 - 48a^2b^2B^2d^4*x^2\text{Log}[a + b*x]^2 - 32a^3b^3B^2d^4*x^3\text{Log}[a + b*x]^2 - 8b^4B^2d^4*x^4\text{Log}[a + b*x]^2 + 16Ab^4Bc^4\text{Log}[(e*(a + b*x))/(c + d*x)] + 4b^4B^2c^4\text{Log}[(e*(a + b*x))/(c + d*x)] - 16a^4ABd^4\text{Log}[(e*(a + b*x))/(c + d*x)] - 4a^4B^2d^4\text{Log}[(e*(a + b*x))/(c + d*x)] + 64Ab^4Bc^3d*x\text{Log}[(e*(a + b*x))/(c + d*x)] + 16b^4B^2c^3d*x\text{Log}[(e*(a + b*x))/(c + d*x)] - 64a^3Ab^4Bd^4*x\text{Log}[(e*(a + b*x))/(c + d*x)] - 16a^3b^4B^2d^4*x\text{Log}[(e*(a + b*x))/(c + d*x)] + 96Ab^4Bc^2d^2*x^2\text{Log}[(e*(a + b*x))/(c + d*x)] + 24b^4B^2c^2d^2*x^2\text{Log}[(e*(a + b*x))/(c + d*x)] - 96a^2A^2b^2Bd^4*x^2\text{Log}[(e*(a + b*x))/(c + d*x)] - 24a^2b^2B^2d^4*x^2\text{Log}[(e*(a + b*x))/(c + d*x)] + 64Ab^4Bc^3d^3*x^3\text{Log}[(e*(a + b*x))/(c + d*x)] + 16b^4B^2c^3d^3*x^3\text{Log}[(e*(a + b*x))/(c + d*x)] - 64a^3Ab^3Bd^4*x^3\text{Log}[(e*(a + b*x))/(c + d*x)] - 16a^3b^3B^2d^4*x^3\text{Log}[(e*(a + b*x))/(c + d*x)] + 16a^4B^2d^4\text{Log}[a + b*x]\text{Log}[(e*(a + b*x))/(c + d*x)] + 64a^3b^4B^2d^4*x\text{Log}[a + b*x]\text{Log}[(e*(a + b*x))/(c + d*x)] + 96a^2b^2B^2d^4*x^2\text{Log}[a + b*x]\text{Log}[(e*(a + b*x))/(c + d*x)] + 64a^3b^3B^2d^4*x^3\text{Log}[a + b*x]\text{Log}[(e*(a + b*x))/(c + d*x)] + 16b^4B^2d^4*x^4\text{Log}[a + b*x]\text{Log}[(e*(a + b*x))/(c + d*x)] + 8b^4B^2c^4\text{Log}[(e*(a + b*x))/(c + d*x)]^2 - 8a^4B^2d^4\text{Log}[(e*(a + b*x))/(c + d*x)]^2 + 32b^4B^2c^3d*x\text{Log}[(e*(a + b*x))/(c + d*x)]^2 - 32a^3b^4B^2d^4*x\text{Log}[(e*(a + b*x))/(c + d*x)]^2 + 48b^4B^2c^2d^2*x^2\text{Log}[(e*(a + b*x))/(c + d*x)]^2 - 48a^2b^2B^2d^4*x^2\text{Log}[(e*(a + b*x))/(c + d*x)]^2 + 32b^4B^2c^2d^3*x^3\text{Log}[(e*(a + b*x))/(c + d*x)]^2 - 32a^3b^3B^2d^4*x^3\text{Log}[(e*(a + b*x))/(c + d*x)]^2 - 16a^4ABd^4\text{Log}[c + d*x] - 4a^4B^2d^4\text{Log}[c + d*x]$$

$$\begin{aligned}
& ] - 64*a^3*A*b*B*d^4*x*Log[c + d*x] - 16*a^3*b*B^2*d^4*x*Log[c + d*x] - 96* \\
& a^2*A*b^2*B*d^4*x^2*Log[c + d*x] - 24*a^2*b^2*B^2*d^4*x^2*Log[c + d*x] - 64 \\
& *a*A*b^3*B*d^4*x^3*Log[c + d*x] - 16*a*b^3*B^2*d^4*x^3*Log[c + d*x] - 16*A* \\
& b^4*B*d^4*x^4*Log[c + d*x] - 4*b^4*B^2*d^4*x^4*Log[c + d*x] + 16*a^4*B^2*d^ \\
& 4*Log[(d*(a + b*x))/(-b*c) + a*d]*Log[c + d*x] + 64*a^3*b*B^2*d^4*x*Log[( \\
& d*(a + b*x))/(-b*c) + a*d]*Log[c + d*x] + 96*a^2*b^2*B^2*d^4*x^2*Log[(d*( \\
& a + b*x))/(-b*c) + a*d]*Log[c + d*x] + 64*a*b^3*B^2*d^4*x^3*Log[(d*(a + b \\
& *x))/(-b*c) + a*d]*Log[c + d*x] + 16*b^4*B^2*d^4*x^4*Log[(d*(a + b*x))/(- \\
& (b*c) + a*d)*Log[c + d*x] - 16*a^4*B^2*d^4*Log[(e*(a + b*x))/(c + d*x)]*Lo \\
& g[c + d*x] - 64*a^3*b*B^2*d^4*x*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x] - \\
& 96*a^2*b^2*B^2*d^4*x^2*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x] - 64*a*b^ \\
& 3*B^2*d^4*x^3*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x] - 16*b^4*B^2*d^4*x^ \\
& 4*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x] - 8*a^4*B^2*d^4*Log[c + d*x]^2 \\
& - 32*a^3*b*B^2*d^4*x*Log[c + d*x]^2 - 48*a^2*b^2*B^2*d^4*x^2*Log[c + d*x]^2 \\
& - 32*a*b^3*B^2*d^4*x^3*Log[c + d*x]^2 - 8*b^4*B^2*d^4*x^4*Log[c + d*x]^2 + \\
& 16*a^4*B^2*d^4*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] + 64*a^3*b*B^2* \\
& d^4*x*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] + 96*a^2*b^2*B^2*d^4*x^2* \\
& Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] + 64*a*b^3*B^2*d^4*x^3*Log[a + \\
& b*x]*Log[(b*(c + d*x))/(b*c - a*d)] + 16*b^4*B^2*d^4*x^4*Log[a + b*x]*Log[( \\
& b*(c + d*x))/(b*c - a*d)] + 16*B^2*d^4*(a + b*x)^4*PolyLog[2, (d*(a + b*x)) \\
& /(-b*c) + a*d] + 16*B^2*d^4*(a + b*x)^4*PolyLog[2, (b*(c + d*x))/(b*c - a \\
& *d)))/(32*b^4*(b*c - a*d)*g^5*(a + b*x)^4)
\end{aligned}$$


---

**Maple [B]** time = 0.053, size = 890, normalized size = 6.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In]  $\text{int}((d*i*x+c*i)^3*(A+B*\ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5, x)$

[Out]  $\begin{aligned}
& 1/4*e^4*d*i^3/(a*d-b*c)^2/g^5*A^2/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^4*a-1 \\
& /4*e^4*i^3/(a*d-b*c)^2/g^5*A^2/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^4*b*c+1/ \\
& 2*e^4*d*i^3/(a*d-b*c)^2/g^5*A*B/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^4*\ln(b* \\
& e/d+(a*d-b*c)*e/d/(d*x+c))*a-1/2*e^4*i^3/(a*d-b*c)^2/g^5*A*B/(b*e/d+e/(d*x+ \\
& c))*a-e/d/(d*x+c)*b*c)^4*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+1/8*e^4*d*i^3/( \\
& a*d-b*c)^2/g^5*A*B/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^4*a-1/8*e^4*i^3/(a*d \\
& -b*c)^2/g^5*A*B/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^4*b*c+1/4*e^4*d*i^3/(a* \\
& d-b*c)^2/g^5*B^2/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^4*\ln(b*e/d+(a*d-b*c)*e \\
& /d/(d*x+c))^2*a-1/4*e^4*i^3/(a*d-b*c)^2/g^5*B^2/(b*e/d+e/(d*x+c))*a-e/d/(d*x \\
& +c)*b*c)^4*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b*c+1/8*e^4*d*i^3/(a*d-b*c)^2/ \\
& g^5*B^2/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^4*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)
\end{aligned}$

```

)) * a - 1/8 * e^4 * i^3 / (a * d - b * c)^2 / g^5 * B^2 / (b * e / d + e / (d * x + c)) * a - e / d / (d * x + c) * b * c)^4 *
ln(b * e / d + (a * d - b * c) * e / d / (d * x + c)) * b * c + 1/32 * e^4 * d * i^3 / (a * d - b * c)^2 / g^5 * B^2 / (b * e
/ d + e / (d * x + c)) * a - e / d / (d * x + c) * b * c)^4 * a - 1/32 * e^4 * i^3 / (a * d - b * c)^2 / g^5 * B^2 / (b * e / d
+ e / (d * x + c)) * a - e / d / (d * x + c) * b * c)^4 * b * c

```

**Maxima [B]** time = 6.38507, size = 15779, normalized size = 107.34

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```

[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x, alg
orithm="maxima")

```

```

[Out] -1/4*(4*b*x + a)*B^2*c^2*d*i^3*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^6*
g^5*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g
^5) - 1/4*(6*b^2*x^2 + 4*a*b*x + a^2)*B^2*c*d^2*i^3*log(b*e*x/(d*x + c) + a
*e/(d*x + c))^2/(b^7*g^5*x^4 + 4*a*b^6*g^5*x^3 + 6*a^2*b^5*g^5*x^2 + 4*a^3*
b^4*g^5*x + a^4*b^3*g^5) - 1/4*(4*b^3*x^3 + 6*a*b^2*x^2 + 4*a^2*b*x + a^3)*
B^2*d^3*i^3*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^8*g^5*x^4 + 4*a*b^7*g
^5*x^3 + 6*a^2*b^6*g^5*x^2 + 4*a^3*b^5*g^5*x + a^4*b^4*g^5) + 1/288*(12*((1
2*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 25*a^3*d^3 -
6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2 + 13*a^2*b*d
^3)*x))/(b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3)*g^5*x^4 +
4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*g^5*x^3 +
6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)*g^5*x^2 +
4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3)*g^5*x +
(a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g^5) + 12*d^4
*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d
^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^
2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5))*log(b*e*x/(d*x + c) + a
e/(d*x + c)) - (9*b^4*c^4 - 64*a*b^3*c^3*d + 216*a^2*b^2*c^2*d^2 - 576*a^3*
b*c*d^3 + 415*a^4*d^4 - 300*(b^4*c*d^3 - a*b^3*d^4)*x^3 + 6*(13*b^4*c^2*d^2
- 176*a*b^3*c*d^3 + 163*a^2*b^2*d^4)*x^2 + 72*(b^4*d^4*x^4 + 4*a*b^3*d^4*x
^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a)^2 + 72*(b^4*
d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*lo
g(d*x + c)^2 - 4*(7*b^4*c^3*d - 60*a*b^3*c^2*d^2 + 324*a^2*b^2*c*d^3 - 271*
a^3*b*d^4)*x - 300*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a
^3*b*d^4*x + a^4*d^4)*log(b*x + a) + 12*(25*b^4*d^4*x^4 + 100*a*b^3*d^4*x^3
+ 150*a^2*b^2*d^4*x^2 + 100*a^3*b*d^4*x + 25*a^4*d^4 - 12*(b^4*d^4*x^4 + 4
*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a))
*log(d*x + c))/(a^4*b^5*c^4*g^5 - 4*a^5*b^4*c^3*d*g^5 + 6*a^6*b^3*c^2*d^2*g

```

$$\begin{aligned}
&^5 - 4a^7b^2c^3d^3g^5 + a^8b^4d^4g^5 + (b^9c^4g^5 - 4a^8b^3c^3d^3g^5 \\
&+ 6a^2b^7c^2d^2g^5 - 4a^3b^6c^3d^3g^5 + a^4b^5d^4g^5)x^4 + 4*( \\
&a^8b^3c^4g^5 - 4a^2b^7c^3d^3g^5 + 6a^3b^6c^2d^2g^5 - 4a^4b^5c^3d^3g^5 + a^5b^4d^4g^5)x^3 + 6*(a^2b^7c^4g^5 - 4a^3b^6c^3d^3g^5 + \\
&6a^4b^5c^2d^2g^5 - 4a^5b^4c^3d^3g^5 + a^6b^3d^4g^5)x^2 + 4*(a^3 \\
&b^6c^4g^5 - 4a^4b^5c^3d^3g^5 + 6a^5b^4c^2d^2g^5 - 4a^6b^3c^3d^3 \\
&3g^5 + a^7b^2d^4g^5)x) * B^2c^3i^3 - 1/288*(12*((7a^3b^3c^3 - 33a^2 \\
&b^2c^2d + 75a^3b^3c^2d^2 - 13a^4d^3 + 12*(4b^4c^2d^2 - ab^3d^3))x^3 \\
&- 6*(4b^4c^2d - 29a^3b^3c^2d^2 + 7a^2b^2d^3)x^2 + 4*(4b^4c^3 - 21 \\
&a^3b^3c^2d + 57a^2b^2c^2d^2 - 13a^3b^3d^3)x)/((b^9c^3 - 3a^8b^8c^2 * \\
&d + 3a^2b^7c^2d^2 - a^3b^6d^3)g^5x^4 + 4*(a^8b^3c^3 - 3a^2b^7c^2d \\
&+ 3a^3b^6c^2d^2 - a^4b^5d^3)g^5x^3 + 6*(a^2b^7c^3 - 3a^3b^6c^2 * \\
&d + 3a^4b^5c^2d^2 - a^5b^4d^3)g^5x^2 + 4*(a^3b^6c^3 - 3a^4b^5c^2 \\
&d + 3a^5b^4c^2d^2 - a^6b^3d^3)g^5x + (a^4b^5c^3 - 3a^5b^4c^2d \\
&+ 3a^6b^3c^2d^2 - a^7b^2d^3)g^5) + 12*(4b^3c^3d^3 - a^4d^4)*log(b*x + a) \\
&/((b^6c^4 - 4a^3b^5c^3d + 6a^2b^4c^2d^2 - 4a^3b^3c^2d^3 + a^4b^2c^3 \\
&d^4)g^5) - 12*(4b^3c^3d^3 - a^4d^4)*log(d*x + c)/((b^6c^4 - 4a^3b^5c^3d + \\
&6a^2b^4c^2d^2 - 4a^3b^3c^2d^3 + a^4b^2c^3d^4)g^5))*log(b*e*x/(d*x + \\
&c) + a*e/(d*x + c)) + (37a^8b^4c^4 - 304a^2b^3c^3d + 1512a^3b^2c^2 * \\
&d^2 - 1360a^4b^3c^2d^3 + 115a^5d^4 + 12*(88b^5c^2d^2 - 101a^4b^4c^3d^3 \\
&+ 13a^2b^3d^4)x^3 - 6*(40b^5c^3d - 609a^4b^4c^2d^2 + 648a^2b^3c^3 \\
&d^3 - 79a^3b^2d^4)x^2 - 72*(4a^4b^3c^2d^3 - a^5d^4 + (4b^5c^3d^3 - \\
&a^4b^4d^4)x^4 + 4*(4a^4b^3c^2d^3 - a^2b^3d^4)x^3 + 6*(4a^2b^3c^2d^3 - \\
&a^3b^2d^4)x^2 + 4*(4a^3b^2c^2d^3 - a^4b^2d^4)x) * log(b*x + a)^2 - 72 * \\
&(4a^4b^3c^2d^3 - a^5d^4 + (4b^5c^3d^3 - a^4b^4d^4)x^4 + 4*(4a^4b^3c^2d^3 \\
&- a^2b^3d^4)x^3 + 6*(4a^2b^3c^2d^3 - a^3b^2d^4)x^2 + 4*(4a^3b^2c^2 \\
&d^3 - a^4b^2d^4)x) * log(d*x + c)^2 + 4*(16b^5c^4 - 163a^4b^4c^3d + 10 \\
&68a^2b^3c^2d^2 - 1036a^3b^2c^2d^3 + 115a^4b^3d^4)x + 12*(88a^4b^3c^3 \\
&d^3 - 13a^5d^4 + (88b^5c^3d^3 - 13a^4b^4d^4)x^4 + 4*(88a^4b^3c^3d^3 - \\
&13a^2b^3d^4)x^3 + 6*(88a^2b^3c^3d^3 - 13a^3b^2d^4)x^2 + 4*(88a^3 \\
&b^2c^3d^3 - 13a^4b^3d^4)x) * log(b*x + a) - 12*(88a^4b^3c^3d^3 - 13a^5d^4 \\
&+ (88b^5c^3d^3 - 13a^4b^4d^4)x^4 + 4*(88a^4b^3c^3d^3 - 13a^2b^3d^4 \\
&)*x^3 + 6*(88a^2b^3c^3d^3 - 13a^3b^2d^4)x^2 + 4*(88a^3b^2c^3d^3 - 1 \\
&3a^4b^3d^4)x - 12*(4a^4b^3c^2d^3 - a^5d^4 + (4b^5c^3d^3 - a^4b^4d^4)x^4 \\
&+ 4*(4a^4b^3c^2d^3 - a^2b^3d^4)x^3 + 6*(4a^2b^3c^2d^3 - a^3b^2d^4) \\
&x^2 + 4*(4a^3b^2c^2d^3 - a^4b^2d^4)x) * log(b*x + a) * log(d*x + c))/(a^4 * \\
&b^6c^4g^5 - 4a^5b^5c^3d^3g^5 + 6a^6b^4c^2d^2g^5 - 4a^7b^3c^3d^3 \\
&g^5 + a^8b^2d^4g^5 + (b^10c^4g^5 - 4a^8b^9c^3d^3g^5 + 6a^2b^8c^2 * \\
&d^2g^5 - 4a^3b^7c^3d^3g^5 + a^4b^6d^4g^5)x^4 + 4*(a^8b^9c^4g^5 - 4 \\
&a^2b^8c^3d^3g^5 + 6a^3b^7c^2d^2g^5 - 4a^4b^6c^3d^3g^5 + a^5b^5 * \\
&d^4g^5)x^3 + 6*(a^2b^8c^4g^5 - 4a^3b^7c^3d^3g^5 + 6a^4b^6c^2d^2 \\
&g^5 - 4a^5b^5c^3d^3g^5 + a^6b^4d^4g^5)x^2 + 4*(a^3b^7c^4g^5 - 4 * \\
&a^4b^6c^3d^3g^5 + 6a^5b^5c^2d^2g^5 - 4a^6b^4c^3d^3g^5 + a^7b^3d^4 \\
&g^5)x) * B^2c^2d^3i^3 - 1/288*(12*((13a^2b^3c^3 - 75a^3b^2c^2d + \\
&33a^4b^3c^2d^2 - 7a^5d^3 - 12*(6b^5c^2d - 4a^4b^4c^2d^2 + a^2b^3d^3
\end{aligned}$$

$$\begin{aligned}
& ) * x^3 + 6 * (6 * b^5 * c^3 - 46 * a * b^4 * c^2 * d + 29 * a^2 * b^3 * c * d^2 - 7 * a^3 * b^2 * d^3) * x \\
& ^2 + 4 * (10 * a * b^4 * c^3 - 63 * a^2 * b^3 * c^2 * d + 33 * a^3 * b^2 * c * d^2 - 7 * a^4 * b * d^3) * x \\
& ) / ((b^{10} * c^3 - 3 * a * b^9 * c^2 * d + 3 * a^2 * b^8 * c * d^2 - a^3 * b^7 * d^3) * g^5 * x^4 + 4 * ( \\
& a * b^9 * c^3 - 3 * a^2 * b^8 * c^2 * d + 3 * a^3 * b^7 * c * d^2 - a^4 * b^6 * d^3) * g^5 * x^3 + 6 * (a \\
& ^2 * b^8 * c^3 - 3 * a^3 * b^7 * c^2 * d + 3 * a^4 * b^6 * c * d^2 - a^5 * b^5 * d^3) * g^5 * x^2 + 4 * ( \\
& a^3 * b^7 * c^3 - 3 * a^4 * b^6 * c^2 * d + 3 * a^5 * b^5 * c * d^2 - a^6 * b^4 * d^3) * g^5 * x + (a^4 \\
& * b^6 * c^3 - 3 * a^5 * b^5 * c^2 * d + 3 * a^6 * b^4 * c * d^2 - a^7 * b^3 * d^3) * g^5) - 12 * (6 * b^ \\
& ^2 * c^2 * d^2 - 4 * a * b * c * d^3 + a^2 * d^4) * \log(b * x + a) / ((b^7 * c^4 - 4 * a * b^6 * c^3 * d + \\
& 6 * a^2 * b^5 * c^2 * d^2 - 4 * a^3 * b^4 * c * d^3 + a^4 * b^3 * d^4) * g^5) + 12 * (6 * b^2 * c^2 * d^ \\
& ^2 - 4 * a * b * c * d^3 + a^2 * d^4) * \log(d * x + c) / ((b^7 * c^4 - 4 * a * b^6 * c^3 * d + 6 * a^2 * b \\
& ^5 * c^2 * d^2 - 4 * a^3 * b^4 * c * d^3 + a^4 * b^3 * d^4) * g^5)) * \log(b * e * x / (d * x + c) + a * e \\
& / (d * x + c)) + (115 * a^2 * b^4 * c^4 - 1360 * a^3 * b^3 * c^3 * d + 1512 * a^4 * b^2 * c^2 * d^2 \\
& - 304 * a^5 * b * c * d^3 + 37 * a^6 * d^4 - 12 * (108 * b^6 * c^3 * d - 148 * a * b^5 * c^2 * d^2 + 47 \\
& * a^2 * b^4 * c * d^3 - 7 * a^3 * b^3 * d^4) * x^3 + 6 * (36 * b^6 * c^4 - 712 * a * b^5 * c^3 * d + 903 \\
& * a^2 * b^4 * c^2 * d^2 - 264 * a^3 * b^3 * c * d^3 + 37 * a^4 * b^2 * d^4) * x^2 + 72 * (6 * a^4 * b^2 * \\
& c^2 * d^2 - 4 * a^5 * b * c * d^3 + a^6 * d^4 + (6 * b^6 * c^2 * d^2 - 4 * a * b^5 * c * d^3 + a^2 * b^ \\
& 4 * d^4) * x^4 + 4 * (6 * a * b^5 * c^2 * d^2 - 4 * a^2 * b^4 * c * d^3 + a^3 * b^3 * d^4) * x^3 + 6 * (6 \\
& * a^2 * b^4 * c^2 * d^2 - 4 * a^3 * b^3 * c * d^3 + a^4 * b^2 * d^4) * x^2 + 4 * (6 * a^3 * b^3 * c^2 * d^ \\
& ^2 - 4 * a^4 * b^2 * c * d^3 + a^5 * b * d^4) * x) * \log(b * x + a)^2 + 72 * (6 * a^4 * b^2 * c^2 * d^2 \\
& - 4 * a^5 * b * c * d^3 + a^6 * d^4 + (6 * b^6 * c^2 * d^2 - 4 * a * b^5 * c * d^3 + a^2 * b^4 * d^4) * x \\
& ^4 + 4 * (6 * a * b^5 * c^2 * d^2 - 4 * a^2 * b^4 * c * d^3 + a^3 * b^3 * d^4) * x^3 + 6 * (6 * a^2 * b^4 \\
& * c^2 * d^2 - 4 * a^3 * b^3 * c * d^3 + a^4 * b^2 * d^4) * x^2 + 4 * (6 * a^3 * b^3 * c^2 * d^2 - 4 * a^ \\
& 4 * b^2 * c * d^3 + a^5 * b * d^4) * x) * \log(d * x + c)^2 + 4 * (76 * a * b^5 * c^4 - 1057 * a^2 * b^4 \\
& * c^3 * d + 1248 * a^3 * b^3 * c^2 * d^2 - 304 * a^4 * b^2 * c * d^3 + 37 * a^5 * b * d^4) * x - 12 * (1 \\
& 08 * a^4 * b^2 * c^2 * d^2 - 40 * a^5 * b * c * d^3 + 7 * a^6 * d^4 + (108 * b^6 * c^2 * d^2 - 40 * a * b \\
& ^5 * c * d^3 + 7 * a^2 * b^4 * d^4) * x^4 + 4 * (108 * a * b^5 * c^2 * d^2 - 40 * a^2 * b^4 * c * d^3 + 7 \\
& * a^3 * b^3 * d^4) * x^3 + 6 * (108 * a^2 * b^4 * c^2 * d^2 - 40 * a^3 * b^3 * c * d^3 + 7 * a^4 * b^2 * d \\
& ^4) * x^2 + 4 * (108 * a^3 * b^3 * c^2 * d^2 - 40 * a^4 * b^2 * c * d^3 + 7 * a^5 * b * d^4) * x) * \log(b \\
& * x + a) + 12 * (108 * a^4 * b^2 * c^2 * d^2 - 40 * a^5 * b * c * d^3 + 7 * a^6 * d^4 + (108 * b^6 * c \\
& ^2 * d^2 - 40 * a * b^5 * c * d^3 + 7 * a^2 * b^4 * d^4) * x^4 + 4 * (108 * a * b^5 * c^2 * d^2 - 40 * a^ \\
& 2 * b^4 * c * d^3 + 7 * a^3 * b^3 * d^4) * x^3 + 6 * (108 * a^2 * b^4 * c^2 * d^2 - 40 * a^3 * b^3 * c * d^ \\
& ^3 + 7 * a^4 * b^2 * d^4) * x^2 + 4 * (108 * a^3 * b^3 * c^2 * d^2 - 40 * a^4 * b^2 * c * d^3 + 7 * a^5 * \\
& b * d^4) * x - 12 * (6 * a^4 * b^2 * c^2 * d^2 - 4 * a^5 * b * c * d^3 + a^6 * d^4 + (6 * b^6 * c^2 * d^2 \\
& - 4 * a * b^5 * c * d^3 + a^2 * b^4 * d^4) * x^4 + 4 * (6 * a * b^5 * c^2 * d^2 - 4 * a^2 * b^4 * c * d^3 \\
& + a^3 * b^3 * d^4) * x^3 + 6 * (6 * a^2 * b^4 * c^2 * d^2 - 4 * a^3 * b^3 * c * d^3 + a^4 * b^2 * d^4) * \\
& x^2 + 4 * (6 * a^3 * b^3 * c^2 * d^2 - 4 * a^4 * b^2 * c * d^3 + a^5 * b * d^4) * x) * \log(b * x + a) * \\
& \log(d * x + c)) / (a^4 * b^7 * c^4 * g^5 - 4 * a^5 * b^6 * c^3 * d * g^5 + 6 * a^6 * b^5 * c^2 * d^2 * g^ \\
& ^5 - 4 * a^7 * b^4 * c * d^3 * g^5 + a^8 * b^3 * d^4 * g^5 + (b^{11} * c^4 * g^5 - 4 * a * b^{10} * c^3 * d * \\
& g^5 + 6 * a^2 * b^9 * c^2 * d^2 * g^5 - 4 * a^3 * b^8 * c * d^3 * g^5 + a^4 * b^7 * d^4 * g^5) * x^4 + \\
& 4 * (a * b^{10} * c^4 * g^5 - 4 * a^2 * b^9 * c^3 * d * g^5 + 6 * a^3 * b^8 * c^2 * d^2 * g^5 - 4 * a^4 * b^7 \\
& * c * d^3 * g^5 + a^5 * b^6 * d^4 * g^5) * x^3 + 6 * (a^2 * b^9 * c^4 * g^5 - 4 * a^3 * b^8 * c^3 * d * g^ \\
& ^5 + 6 * a^4 * b^7 * c^2 * d^2 * g^5 - 4 * a^5 * b^6 * c * d^3 * g^5 + a^6 * b^5 * d^4 * g^5) * x^2 + 4 * \\
& (a^3 * b^8 * c^4 * g^5 - 4 * a^4 * b^7 * c^3 * d * g^5 + 6 * a^5 * b^6 * c^2 * d^2 * g^5 - 4 * a^6 * b^5 * \\
& c * d^3 * g^5 + a^7 * b^4 * d^4 * g^5) * x) * B^2 * c * d^2 * i^3 - 1 / 288 * (12 * ((25 * a^3 * b^3 * c^3 \\
& - 23 * a^4 * b^2 * c^2 * d + 13 * a^5 * b * c * d^2 - 3 * a^6 * d^3 + 12 * (4 * b^6 * c^3 - 6 * a * b^5 *
\end{aligned}$$

$$\begin{aligned}
& c^2*d + 4*a^2*b^4*c*d^2 - a^3*b^3*d^3)*x^3 + 6*(18*a*b^5*c^3 - 22*a^2*b^4*c^2*d + 13*a^3*b^3*c*d^2 - 3*a^4*b^2*d^3)*x^2 + 4*(22*a^2*b^4*c^3 - 23*a^3*b^3*c^2*d + 13*a^4*b^2*c*d^2 - 3*a^5*b*d^3)*x)/((b^11*c^3 - 3*a*b^10*c^2*d + 3*a^2*b^9*c*d^2 - a^3*b^8*d^3)*g^5*x^4 + 4*(a*b^10*c^3 - 3*a^2*b^9*c^2*d + 3*a^3*b^8*c*d^2 - a^4*b^7*d^3)*g^5*x^3 + 6*(a^2*b^9*c^3 - 3*a^3*b^8*c^2*d + 3*a^4*b^7*c*d^2 - a^5*b^6*d^3)*g^5*x^2 + 4*(a^3*b^8*c^3 - 3*a^4*b^7*c^2*d + 3*a^5*b^6*c*d^2 - a^6*b^5*d^3)*g^5*x + (a^4*b^7*c^3 - 3*a^5*b^6*c^2*d + 3*a^6*b^5*c*d^2 - a^7*b^4*d^3)*g^5) + 12*(4*b^3*c^3*d - 6*a*b^2*c^2*d^2 + 4*a^2*b*c*d^3 - a^3*d^4)*log(b*x + a)/((b^8*c^4 - 4*a*b^7*c^3*d + 6*a^2*b^6*c^2*d^2 - 4*a^3*b^5*c*d^3 + a^4*b^4*d^4)*g^5) - 12*(4*b^3*c^3*d - 6*a*b^2*c^2*d^2 + 4*a^2*b*c*d^3 - a^3*d^4)*log(d*x + c)/((b^8*c^4 - 4*a*b^7*c^3*d + 6*a^2*b^6*c^2*d^2 - 4*a^3*b^5*c*d^3 + a^4*b^4*d^4)*g^5))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + (415*a^3*b^4*c^4 - 576*a^4*b^3*c^3*d + 216*a^5*b^2*c^2*d^2 - 64*a^6*b*c*d^3 + 9*a^7*d^4 + 12*(48*b^7*c^4 - 84*a*b^6*c^3*d + 52*a^2*b^5*c^2*d^2 - 19*a^3*b^4*c*d^3 + 3*a^4*b^3*d^4)*x^3 + 6*(252*a*b^6*c^4 - 400*a^2*b^5*c^3*d + 203*a^3*b^4*c^2*d^2 - 64*a^4*b^3*c*d^3 + 9*a^5*b^2*d^4)*x^2 - 72*(4*a^4*b^3*c^3*d - 6*a^5*b^2*c^2*d^2 + 4*a^6*b*c*d^3 - a^7*d^4 + (4*b^7*c^3*d - 6*a*b^6*c^2*d^2 + 4*a^2*b^5*c*d^3 - a^3*b^4*d^4)*x^4 + 4*(4*a*b^6*c^3*d - 6*a^2*b^5*c^2*d^2 + 4*a^3*b^4*c*d^3 - a^4*b^3*d^4)*x^3 + 6*(4*a^2*b^5*c^3*d - 6*a^3*b^4*c^2*d^2 + 4*a^4*b^3*c*d^3 - a^5*b^2*d^4)*x^2 + 4*(4*a^3*b^4*c^3*d - 6*a^4*b^3*c^2*d^2 + 4*a^5*b^2*c*d^3 - a^6*b*d^4)*x)*log(b*x + a)^2 - 72*(4*a^4*b^3*c^3*d - 6*a^5*b^2*c^2*d^2 + 4*a^6*b*c*d^3 - a^7*d^4 + (4*b^7*c^3*d - 6*a*b^6*c^2*d^2 + 4*a^2*b^5*c*d^3 - a^3*b^4*d^4)*x^4 + 4*(4*a*b^6*c^3*d - 6*a^2*b^5*c^2*d^2 + 4*a^3*b^4*c*d^3 - a^4*b^3*d^4)*x^3 + 6*(4*a^2*b^5*c^3*d - 6*a^3*b^4*c^2*d^2 + 4*a^4*b^3*c*d^3 - a^5*b^2*d^4)*x^2 + 4*(4*a^3*b^4*c^3*d - 6*a^4*b^3*c^2*d^2 + 4*a^5*b^2*c*d^3 - a^6*b*d^4)*x)*log(d*x + c)^2 + 4*(340*a^2*b^5*c^4 - 501*a^3*b^4*c^3*d + 216*a^4*b^3*c^2*d^2 - 64*a^5*b^2*c*d^3 + 9*a^6*b*d^4)*x + 12*(48*a^4*b^3*c^3*d - 36*a^5*b^2*c^2*d^2 + 16*a^6*b*c*d^3 - 3*a^7*d^4 + (48*b^7*c^3*d - 36*a*b^6*c^2*d^2 + 16*a^2*b^5*c*d^3 - 3*a^3*b^4*d^4)*x^4 + 4*(48*a*b^6*c^3*d - 36*a^2*b^5*c^2*d^2 + 16*a^3*b^4*c*d^3 - 3*a^4*b^3*d^4)*x^3 + 6*(48*a^2*b^5*c^3*d - 36*a^3*b^4*c^2*d^2 + 16*a^4*b^3*c*d^3 - 3*a^5*b^2*d^4)*x^2 + 4*(48*a^3*b^4*c^3*d - 36*a^4*b^3*c^2*d^2 + 16*a^5*b^2*c*d^3 - 3*a^6*b*d^4)*x - 12*(4*a^4*b^3*c^3*d - 6*a^5*b^2*c^2*d^2 + 4*a^6*b*c*d^3 - a^7*d^4 + (4*b^7*c^3*d - 6*a*b^6*c^2*d^2 + 4*a^2*b^5*c*d^3 - a^3*b^4*d^4)*x^4 + 4*(48*a*b^6*c^3*d - 36*a^2*b^5*c^2*d^2 + 16*a^3*b^4*c*d^3 - 3*a^4*b^3*d^4)*x^3 + 6*(48*a^2*b^5*c^3*d - 36*a^3*b^4*c^2*d^2 + 16*a^4*b^3*c*d^3 - 3*a^5*b^2*d^4)*x^2 + 4*(48*a^3*b^4*c^3*d - 36*a^4*b^3*c^2*d^2 + 16*a^5*b^2*c*d^3 - 3*a^6*b*d^4)*x)*log(b*x + a))*log(d*x + c))/(a^4*b^8*c^4*g^5 - 4*a^5*b^7*c^3*d*g^5 + 6*a^6*b^6*c^2*d^2*g^5 - 4*a^7*b^5*c*d^3*g^5 + a^8*b^4*d^4*g^5 + (b^12*c^4*g
\end{aligned}$$

$$\begin{aligned}
&^5 - 4*a*b^{11}*c^3*d*g^5 + 6*a^2*b^{10}*c^2*d^2*g^5 - 4*a^3*b^9*c*d^3*g^5 + a^4*b^8*d^4*g^5)*x^4 + 4*(a*b^{11}*c^4*g^5 - 4*a^2*b^{10}*c^3*d*g^5 + 6*a^3*b^9*c^2*d^2*g^5 - 4*a^4*b^8*c*d^3*g^5 + a^5*b^7*d^4*g^5)*x^3 + 6*(a^2*b^{10}*c^4*g^5 - 4*a^3*b^9*c^3*d*g^5 + 6*a^4*b^8*c^2*d^2*g^5 - 4*a^5*b^7*c*d^3*g^5 + a^6*b^6*d^4*g^5)*x^2 + 4*(a^3*b^9*c^4*g^5 - 4*a^4*b^8*c^3*d*g^5 + 6*a^5*b^7*c^2*d^2*g^5 - 4*a^6*b^6*c*d^3*g^5 + a^7*b^5*d^4*g^5)*x))*B^2*d^3*i^3 - 1/24*A*B*d^3*i^3*(12*(4*b^3*x^3 + 6*a*b^2*x^2 + 4*a^2*b*x + a^3)*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^8*g^5*x^4 + 4*a*b^7*g^5*x^3 + 6*a^2*b^6*g^5*x^2 + 4*a^3*b^5*g^5*x + a^4*b^4*g^5) + (25*a^3*b^3*c^3 - 23*a^4*b^2*c^2*d + 13*a^5*b*c*d^2 - 3*a^6*d^3 + 12*(4*b^6*c^3 - 6*a*b^5*c^2*d + 4*a^2*b^4*c*d^2 - a^3*b^3*d^3)*x^3 + 6*(18*a*b^5*c^3 - 22*a^2*b^4*c^2*d + 13*a^3*b^3*c*d^2 - 3*a^4*b^2*d^3)*x^2 + 4*(22*a^2*b^4*c^3 - 23*a^3*b^3*c^2*d + 13*a^4*b^2*c*d^2 - 3*a^5*b*d^3)*x)/((b^11*c^3 - 3*a*b^10*c^2*d + 3*a^2*b^9*c*d^2 - a^3*b^8*d^3)*g^5*x^4 + 4*(a*b^10*c^3 - 3*a^2*b^9*c^2*d + 3*a^3*b^8*c*d^2 - a^4*b^7*d^3)*g^5*x^3 + 6*(a^2*b^9*c^3 - 3*a^3*b^8*c^2*d + 3*a^4*b^7*c*d^2 - a^5*b^6*d^3)*g^5*x^2 + 4*(a^3*b^8*c^3 - 3*a^4*b^7*c^2*d + 3*a^5*b^6*c*d^2 - a^6*b^5*d^3)*g^5*x + (a^4*b^7*c^3 - 3*a^5*b^6*c^2*d + 3*a^6*b^5*c*d^2 - a^7*b^4*d^3)*g^5) + 12*(4*b^3*c^3*d - 6*a*b^2*c^2*d^2 + 4*a^2*b*c*d^3 - a^3*d^4)*log(b*x + a)/((b^8*c^4 - 4*a*b^7*c^3*d + 6*a^2*b^6*c^2*d^2 - 4*a^3*b^5*c*d^3 + a^4*b^4*d^4)*g^5) - 12*(4*b^3*c^3*d - 6*a*b^2*c^2*d^2 + 4*a^2*b*c*d^3 - a^3*d^4)*log(d*x + c)/((b^8*c^4 - 4*a*b^7*c^3*d + 6*a^2*b^6*c^2*d^2 - 4*a^3*b^5*c*d^3 + a^4*b^4*d^4)*g^5)) - 1/24*A*B*c*d^2*i^3*(12*(6*b^2*x^2 + 4*a*b*x + a^2)*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^7*g^5*x^4 + 4*a*b^6*g^5*x^3 + 6*a^2*b^5*g^5*x^2 + 4*a^3*b^4*g^5*x + a^4*b^3*g^5) + (13*a^2*b^3*c^3 - 7*5*a^3*b^2*c^2*d + 33*a^4*b*c*d^2 - 7*a^5*d^3 - 12*(6*b^5*c^2*d - 4*a*b^4*c*d^2 + a^2*b^3*d^3)*x^3 + 6*(6*b^5*c^3 - 46*a*b^4*c^2*d + 29*a^2*b^3*c*d^2 - 7*a^3*b^2*d^3)*x^2 + 4*(10*a*b^4*c^3 - 63*a^2*b^3*c^2*d + 33*a^3*b^2*c*d^2 - 7*a^4*b*d^3)*x)/((b^10*c^3 - 3*a*b^9*c^2*d + 3*a^2*b^8*c*d^2 - a^3*b^7*d^3)*g^5*x^4 + 4*(a*b^9*c^3 - 3*a^2*b^8*c^2*d + 3*a^3*b^7*c*d^2 - a^4*b^6*d^3)*g^5*x^3 + 6*(a^2*b^8*c^3 - 3*a^3*b^7*c^2*d + 3*a^4*b^6*c*d^2 - a^5*b^5*d^3)*g^5*x^2 + 4*(a^3*b^7*c^3 - 3*a^4*b^6*c^2*d + 3*a^5*b^5*c*d^2 - a^6*b^4*d^3)*g^5*x + (a^4*b^6*c^3 - 3*a^5*b^5*c^2*d + 3*a^6*b^4*c*d^2 - a^7*b^3*d^3)*g^5) - 12*(6*b^2*c^2*d^2 - 4*a*b*c*d^3 + a^2*d^4)*log(b*x + a)/((b^7*c^4 - 4*a*b^6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4*a^3*b^4*c*d^3 + a^4*b^3*d^4)*g^5) + 12*(6*b^2*c^2*d^2 - 4*a*b*c*d^3 + a^2*d^4)*log(d*x + c)/((b^7*c^4 - 4*a*b^6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4*a^3*b^4*c*d^3 + a^4*b^3*d^4)*g^5)) - 1/24*A*B*c^2*d*i^3*(12*(4*b*x + a)*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^6*g^5*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g^5) + (7*a*b^3*c^3 - 33*a^2*b^2*c^2*d + 75*a^3*b*c*d^2 - 13*a^4*d^3 + 12*(4*b^4*c*d^2 - a*b^3*d^3)*x^3 - 6*(4*b^4*c^2*d - 29*a*b^3*c*d^2 + 7*a^2*b^2*d^3)*x^2 + 4*(4*b^4*c^3 - 21*a*b^3*c^2*d + 57*a^2*b^2*c*d^2 - 13*a^3*b*d^3)*x)/((b^9*c^3 - 3*a*b^8*c^2*d + 3*a^2*b^7*c*d^2 - a^3*b^6*d^3)*g^5*x^4 + 4*(a*b^8*c^3 - 3*a^2*b^7*c^2*d + 3*a^3*b^6*c*d^2 - a^4*b^5*d^3)*g^5*x^3 + 6*(a^2*b^7*c^3 - 3*a^3*b^6*c^2*d + 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)*g^5*x^2 + 4*(a^3*b^6*c^3 - 3*a^4*b^5*c^2*d + 3*a^5*b^4*c*d^2 - a^6*b^3*d^3)*g^5*x + (a^4*b^5
\end{aligned}$$



$$\begin{aligned}
& *c^3 - 3a^5b^4c^2d + 3a^6b^3c^2d^2 - a^7b^2d^3)g^5) + 12(4b^3c^2d^3 - a^4d^4) \log(bx + a) / ((b^6c^4 - 4a^2b^5c^3d + 6a^2b^4c^2d^2 - 4a^3b^3c^2d^3 + a^4b^2d^4)g^5) - 12(4b^3c^2d^3 - a^4d^4) \log(dx + c) / ((b^6c^4 - 4a^2b^5c^3d + 6a^2b^4c^2d^2 - 4a^3b^3c^2d^3 + a^4b^2d^4)g^5) + 1/24A^2B^2c^3i^3((12b^3d^3x^3 - 3b^3c^3 + 13a^2b^2c^2d - 23a^2b^2c^2d + 25a^3d^3 - 6(b^3c^2d^2 - 7a^2b^2d^3)x^2 + 4(b^3c^2d - 5a^2b^2c^2d + 13a^2b^2d^3)x) / ((b^8c^3 - 3a^2b^7c^2d + 3a^2b^6c^2d^2 - a^3b^5d^3)g^5x^4 + 4(a^2b^7c^3 - 3a^2b^6c^2d + 3a^3b^5c^2d^2 - a^4b^4d^3)g^5x^3 + 6(a^2b^6c^3 - 3a^3b^5c^2d + 3a^4b^4c^2d^2 - a^5b^3d^3)g^5x^2 + 4(a^3b^5c^3 - 3a^4b^4c^2d + 3a^5b^3c^2d^2 - a^6b^2d^3)g^5x + (a^4b^4c^3 - 3a^5b^3c^2d + 3a^6b^2c^2d^2 - a^7b^2d^3)g^5) - 12 \log(b^2e^2x / (dx + c) + ae / (dx + c)) / (b^5g^5x^4 + 4a^2b^4g^5x^3 + 6a^2b^3g^5x^2 + 4a^3b^2g^5x + a^4b^2g^5) + 12d^4 \log(bx + a) / ((b^5c^4 - 4a^2b^4c^3d + 6a^2b^3c^2d^2 - 4a^3b^2c^2d^3 + a^4b^2d^4)g^5) - 12d^4 \log(dx + c) / ((b^5c^4 - 4a^2b^4c^3d + 6a^2b^3c^2d^2 - 4a^3b^2c^2d^3 + a^4b^2d^4)g^5) - 1/4B^2c^3i^3 \log(b^2e^2x / (dx + c) + ae / (dx + c))^2 / (b^5g^5x^4 + 4a^2b^4g^5x^3 + 6a^2b^3g^5x^2 + 4a^3b^2g^5x + a^4b^2g^5) - 1/4(4bx + a)A^2c^2d^2i^3 / (b^6g^5x^4 + 4a^2b^5g^5x^3 + 6a^2b^4g^5x^2 + 4a^3b^3g^5x + a^4b^2g^5) - 1/4(6b^2x^2 + 4a^2bx + a^2)A^2c^2d^2i^3 / (b^7g^5x^4 + 4a^2b^6g^5x^3 + 6a^2b^5g^5x^2 + 4a^3b^4g^5x + a^4b^3g^5) - 1/4(4b^3x^3 + 6a^2b^2x^2 + 4a^2bx + a^3)A^2d^3i^3 / (b^8g^5x^4 + 4a^2b^7g^5x^3 + 6a^2b^6g^5x^2 + 4a^3b^5g^5x + a^4b^4g^5) - 1/4A^2c^3i^3 / (b^5g^5x^4 + 4a^2b^4g^5x^3 + 6a^2b^3g^5x^2 + 4a^3b^2g^5x + a^4b^2g^5)
\end{aligned}$$

**Fricas [B]** time = 0.584212, size = 1127, normalized size = 7.67

$$4((8A^2 + 4AB + B^2)b^4cd^3 - (8A^2 + 4AB + B^2)ab^3d^4)i^3x^3 + 6((8A^2 + 4AB + B^2)b^4c^2d^2 - (8A^2 + 4AB + B^2)a^2t$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^5,x, algorithm="fricas")

[Out] -1/32\*(4\*((8A^2 + 4A\*B + B^2)\*b^4\*c\*d^3 - (8A^2 + 4A\*B + B^2)\*a\*b^3\*d^4)\*i^3\*x^3 + 6\*((8A^2 + 4A\*B + B^2)\*b^4\*c^2\*d^2 - (8A^2 + 4A\*B + B^2)\*a^2\*b^2\*d^4)\*i^3\*x^2 + 4\*((8A^2 + 4A\*B + B^2)\*b^4\*c^3\*d - (8A^2 + 4A\*B + B^2)\*a^3\*b\*d^4)\*i^3\*x + ((8A^2 + 4A\*B + B^2)\*b^4\*c^4 - (8A^2 + 4A\*B + B^2)\*a^4\*d^4)\*i^3 + 8\*(B^2\*b^4\*d^4\*i^3\*x^4 + 4\*B^2\*b^4\*c\*d^3\*i^3\*x^3 + 6\*B^2

```
*b^4*c^2*d^2*i^3*x^2 + 4*B^2*b^4*c^3*d*i^3*x + B^2*b^4*c^4*i^3)*log((b*e*x
+ a*e)/(d*x + c))^2 + 4*((4*A*B + B^2)*b^4*d^4*i^3*x^4 + 4*(4*A*B + B^2)*b^
4*c*d^3*i^3*x^3 + 6*(4*A*B + B^2)*b^4*c^2*d^2*i^3*x^2 + 4*(4*A*B + B^2)*b^4
*c^3*d*i^3*x + (4*A*B + B^2)*b^4*c^4*i^3)*log((b*e*x + a*e)/(d*x + c)))/((b
^9*c - a*b^8*d)*g^5*x^4 + 4*(a*b^8*c - a^2*b^7*d)*g^5*x^3 + 6*(a^2*b^7*c -
a^3*b^6*d)*g^5*x^2 + 4*(a^3*b^6*c - a^4*b^5*d)*g^5*x + (a^4*b^5*c - a^5*b^4
*d)*g^5)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**5,x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3 \left( B \log \left( \frac{bx+a}{dx+c} \right) + A \right)^2}{(bgx + ag)^5} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x, alg
orithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g
)^5, x)
```

$$3.82 \quad \int \frac{(ci+dx)^3 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)^2}{(ag+bgx)^6} dx$$

**Optimal.** Leaf size=299

$$\frac{bi^3(c+dx)^5 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)^2}{5g^6(a+bx)^5(bc-ad)^2} - \frac{2bBi^3(c+dx)^5 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{25g^6(a+bx)^5(bc-ad)^2} + \frac{di^3(c+dx)^4 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)^2}{4g^6(a+bx)^4(bc-ad)^2} + \dots$$

[Out]  $(B^2 d^3 i^3 (c+dx)^4) / (32 (b^2 c - a^2 d)^2 g^6 (a+bx)^4) - (2 b^2 B^2 i^3 (c+dx)^5) / (125 (b^2 c - a^2 d)^2 g^6 (a+bx)^5) + (B d^3 i^3 (c+dx)^4 (A + B \log[(e(a+bx))/(c+dx)])) / (8 (b^2 c - a^2 d)^2 g^6 (a+bx)^4) - (2 b^2 B i^3 (c+dx)^5 (A + B \log[(e(a+bx))/(c+dx)])) / (25 (b^2 c - a^2 d)^2 g^6 (a+bx)^5) + (d i^3 (c+dx)^4 (A + B \log[(e(a+bx))/(c+dx)]))^2 / (4 (b^2 c - a^2 d)^2 g^6 (a+bx)^4) - (b i^3 (c+dx)^5 (A + B \log[(e(a+bx))/(c+dx)]))^2 / (5 (b^2 c - a^2 d)^2 g^6 (a+bx)^5)$

**Rubi [C]** time = 5.19533, antiderivative size = 1061, normalized size of antiderivative = 3.55, number of steps used = 146, number of rules used = 11, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.262$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{B^2 i^3 \log^2(a+bx) d^5}{20b^4(bc-ad)^2 g^6} - \frac{B^2 i^3 \log^2(c+dx) d^5}{20b^4(bc-ad)^2 g^6} + \frac{9B^2 i^3 \log(a+bx) d^5}{200b^4(bc-ad)^2 g^6} + \frac{Bi^3 \log(a+bx) \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right) d^5}{10b^4(bc-ad)^2 g^6} - \frac{9B^2 i^3 \log^2(a+bx) d^5}{200b^4(bc-ad)^2 g^6}$$

Antiderivative was successfully verified.

[In] Int[((c\*i + d\*i\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))^2)/(a\*g + b\*g\*x)^6,x]

[Out]  $(-2 B^2 (b^2 c - a^2 d)^3 i^3) / (125 b^4 g^6 (a+bx)^5) - (39 B^2 d (b^2 c - a^2 d)^2 i^3) / (800 b^4 g^6 (a+bx)^4) - (7 B^2 d^2 (b^2 c - a^2 d) i^3) / (200 b^4 g^6 (a+bx)^3) + (11 B^2 d^3 i^3) / (400 b^4 g^6 (a+bx)^2) + (9 B^2 d^4 i^3) / (200 b^4 (b^2 c - a^2 d) g^6 (a+bx)) + (9 B^2 d^5 i^3 \log[a+bx]) / (200 b^4 (b^2 c - a^2 d)^2 g^6) - (B^2 d^5 i^3 \log[a+bx]^2) / (20 b^4 (b^2 c - a^2 d)^2 g^6) - (2 B (b^2 c - a^2 d)^3 i^3 (A + B \log[(e(a+bx))/(c+dx)])) / (25 b^4 g^6 (a+bx)^5) - (11 B d (b^2 c - a^2 d)^2 i^3 (A + B \log[(e(a+bx))/(c+dx)])) / (40 b^4 g^6 (a+bx)^4) - (3 B d^2 (b^2 c - a^2 d) i^3 (A + B \log[(e(a+bx))/(c+dx)])) / (10 b^4 g^6 (a+bx)^3) - (B d^3 i^3 (A + B \log[(e(a+bx))/(c+dx)])) / (20 b^4 g^6 (a+bx)^2) + (B d^4 i^3 (A + B \log[(e(a+bx))/(c+dx)])) / (10 b^4 (b^2 c - a^2 d) g^6 (a+bx)) + (B d^5 i^3$

```

*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(10*b^4*(b*c - a*d)^2*g
^6) - ((b*c - a*d)^3*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]^2)/(5*b^4*g^6
*(a + b*x)^5) - (3*d*(b*c - a*d)^2*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]
^2)/(4*b^4*g^6*(a + b*x)^4) - (d^2*(b*c - a*d)*i^3*(A + B*Log[(e*(a + b*x))
/(c + d*x)]^2)/(b^4*g^6*(a + b*x)^3) - (d^3*i^3*(A + B*Log[(e*(a + b*x))/(
c + d*x)]^2)/(2*b^4*g^6*(a + b*x)^2) - (9*B^2*d^5*i^3*Log[c + d*x])/(200*b
^4*(b*c - a*d)^2*g^6) + (B^2*d^5*i^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[
c + d*x])/(10*b^4*(b*c - a*d)^2*g^6) - (B*d^5*i^3*(A + B*Log[(e*(a + b*x))/
(c + d*x)]*Log[c + d*x])/(10*b^4*(b*c - a*d)^2*g^6) - (B^2*d^5*i^3*Log[c +
d*x]^2)/(20*b^4*(b*c - a*d)^2*g^6) + (B^2*d^5*i^3*Log[a + b*x]*Log[(b*(c +
d*x))/(b*c - a*d)]/(10*b^4*(b*c - a*d)^2*g^6) + (B^2*d^5*i^3*PolyLog[2, -
((d*(a + b*x))/(b*c - a*d))]/(10*b^4*(b*c - a*d)^2*g^6) + (B^2*d^5*i^3*Pol
yLog[2, (b*(c + d*x))/(b*c - a*d)]/(10*b^4*(b*c - a*d)^2*g^6)

```

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]

```

### Rule 2525

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]

```

### Rule 12

```

Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]

```

### Rule 44

```

Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])

```

### Rule 2524

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S

```

```

ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

```

### Rule 2418

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]

```

### Rule 2390

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]

```

### Rule 2301

```

Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]

```

### Rule 2394

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]

```

### Rule 2393

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]

```

### Rule 2391

```

Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]

```

### Rubi steps

$$\begin{aligned}
\int \frac{(82c + 82dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(ag + bgx)^6} dx &= \int \left( \frac{551368(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3 g^6 (a + bx)^6} + \frac{1654104d(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^6 (a + bx)^5} \right) dx \\
&= \frac{(551368d^3) \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(a+bx)^3} dx}{b^3 g^6} + \frac{(1654104d^2(bc - ad)) \int \frac{A + B \log \left( \frac{e(a+bx)}{c+dx} \right)}{(a+bx)^4} dx}{b^3 g^6} \\
&= -\frac{551368(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{5b^4 g^6 (a + bx)^5} - \frac{413526d(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^4 g^6 (a + bx)^4} \\
&= -\frac{551368(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{5b^4 g^6 (a + bx)^5} - \frac{413526d(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^4 g^6 (a + bx)^4} \\
&= -\frac{551368(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{5b^4 g^6 (a + bx)^5} - \frac{413526d(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^4 g^6 (a + bx)^4} \\
&= -\frac{551368(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{5b^4 g^6 (a + bx)^5} - \frac{413526d(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^4 g^6 (a + bx)^4} \\
&= -\frac{1102736B(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{25b^4 g^6 (a + bx)^5} - \frac{758131Bd(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{5b^4 g^6 (a + bx)^4} \\
&= -\frac{1102736B(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{25b^4 g^6 (a + bx)^5} - \frac{758131Bd(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{5b^4 g^6 (a + bx)^4} \\
&= -\frac{1102736B(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{25b^4 g^6 (a + bx)^5} - \frac{758131Bd(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{5b^4 g^6 (a + bx)^4} \\
&= -\frac{1102736B^2(bc - ad)^3}{125b^4 g^6 (a + bx)^5} - \frac{2687919B^2d(bc - ad)^2}{100b^4 g^6 (a + bx)^4} - \frac{482447B^2d^2(bc - ad)}{25b^4 g^6 (a + bx)^3} + \\
&= -\frac{1102736B^2(bc - ad)^3}{125b^4 g^6 (a + bx)^5} - \frac{2687919B^2d(bc - ad)^2}{100b^4 g^6 (a + bx)^4} - \frac{482447B^2d^2(bc - ad)}{25b^4 g^6 (a + bx)^3} + \\
&= -\frac{1102736B^2(bc - ad)^3}{125b^4 g^6 (a + bx)^5} - \frac{2687919B^2d(bc - ad)^2}{100b^4 g^6 (a + bx)^4} - \frac{482447B^2d^2(bc - ad)}{25b^4 g^6 (a + bx)^3} + \\
&= -\frac{1102736B^2(bc - ad)^3}{125b^4 g^6 (a + bx)^5} - \frac{2687919B^2d(bc - ad)^2}{100b^4 g^6 (a + bx)^4} - \frac{482447B^2d^2(bc - ad)}{25b^4 g^6 (a + bx)^3} +
\end{aligned}$$

**Mathematica [C]** time = 4.47046, size = 2289, normalized size = 7.66

Result too large to show

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))^2)/(a\*g + b\*g\*x)^6,x]

[Out] (i^3\*(2000\*a^2\*B^2\*d^2\*(b\*c - a\*d)^3 - 825\*a\*B^2\*d\*(b\*c - a\*d)^4 - 192\*B^2\*(b\*c - a\*d)^5 + 4000\*a\*b\*B^2\*d^2\*(b\*c - a\*d)^3\*x - 825\*b\*B^2\*d\*(b\*c - a\*d)^4\*x + 2000\*b^2\*B^2\*d^2\*(b\*c - a\*d)^3\*x^2 - 3000\*a^2\*B^2\*d^3\*(b\*c - a\*d)^2\*(a + b\*x) + 1100\*a\*B^2\*d^2\*(b\*c - a\*d)^3\*(a + b\*x) + 240\*B^2\*d\*(b\*c - a\*d)^4\*(a + b\*x) - 6000\*a\*b\*B^2\*d^3\*(b\*c - a\*d)^2\*x\*(a + b\*x) + 1100\*b\*B^2\*d^2\*(b\*c - a\*d)^3\*x\*(a + b\*x) - 3000\*b^2\*B^2\*d^3\*(b\*c - a\*d)^2\*x^2\*(a + b\*x) + 6000\*a^2\*B^2\*d^4\*(b\*c - a\*d)\*(a + b\*x)^2 - 6150\*a\*B^2\*d^3\*(b\*c - a\*d)^2\*(a + b\*x)^2 + 3520\*B^2\*d^2\*(-(b\*c) + a\*d)^3\*(a + b\*x)^2 + 12000\*a\*b\*B^2\*d^4\*(b\*c - a\*d)\*x\*(a + b\*x)^2 - 6150\*b\*B^2\*d^3\*(b\*c - a\*d)^2\*x\*(a + b\*x)^2 + 6000\*b^2\*B^2\*d^4\*(b\*c - a\*d)\*x^2\*(a + b\*x)^2 + 18000\*a\*b\*B^2\*d^4\*(a + b\*x)^3 - 18000\*a^2\*B^2\*d^5\*(a + b\*x)^3 + 12300\*a\*B^2\*d^4\*(b\*c - a\*d)\*(a + b\*x)^3 + 9480\*B^2\*d^3\*(b\*c - a\*d)^2\*(a + b\*x)^3 + 18000\*b^2\*B^2\*d^4\*x\*(a + b\*x)^3 - 18000\*a\*b\*B^2\*d^5\*x\*(a + b\*x)^3 + 12300\*b\*B^2\*d^4\*(b\*c - a\*d)\*x\*(a + b\*x)^3 - 16800\*b\*B^2\*d^4\*(a + b\*x)^4 + 16800\*a\*B^2\*d^5\*(a + b\*x)^4 + 18960\*B^2\*d^4\*(-(b\*c) + a\*d)\*(a + b\*x)^4 + 6000\*a^2\*B^2\*d^5\*(a + b\*x)^3\*Log[a + b\*x] + 12000\*a\*b\*B^2\*d^5\*x\*(a + b\*x)^3\*Log[a + b\*x] + 6000\*b^2\*B^2\*d^5\*x^2\*(a + b\*x)^3\*Log[a + b\*x] + 30300\*a\*B^2\*d^5\*(a + b\*x)^4\*Log[a + b\*x] + 30300\*b\*B^2\*d^5\*x\*(a + b\*x)^4\*Log[a + b\*x] - 35760\*B^2\*d^5\*(a + b\*x)^5\*Log[a + b\*x] - 4500\*a\*B\*d\*(b\*c - a\*d)^4\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])) - 960\*B\*(b\*c - a\*d)^5\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])) - 4500\*b\*B\*d\*(b\*c - a\*d)^4\*x\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])) + 6000\*a\*B\*d^2\*(b\*c - a\*d)^3\*(a + b\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])) + 1200\*B\*d\*(b\*c - a\*d)^4\*(a + b\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])) + 6000\*b\*B\*d^2\*(b\*c - a\*d)^3\*x\*(a + b\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])) - 9000\*a\*B\*d^3\*(b\*c - a\*d)^2\*(a + b\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])) + 9600\*B\*d^2\*(-(b\*c) + a\*d)^3\*(a + b\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])) - 9000\*b\*B\*d^3\*(b\*c - a\*d)^2\*x\*(a + b\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])) + 18000\*a\*B\*d^4\*(b\*c - a\*d)\*(a + b\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])) + 8400\*B\*d^3\*(b\*c - a\*d)^2\*(a + b\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])) + 18000\*b\*B\*d^4\*(b\*c - a\*d)\*x\*(a + b\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])) + 16800\*B\*d^4\*(-(b\*c) + a\*d)\*(a + b\*x)^4\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])) + 18000\*a\*B\*d^5\*(a + b\*x)^4\*Log[a + b\*x]\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])) + 18000\*b\*B\*d^5\*x\*(a + b\*x)^4\*Log[a + b\*x]\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])) - 16800\*B\*d^5\*(a + b\*x)^5\*Log[a + b\*x]\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])) - 24000\*(b\*c - a\*d)^5\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))^2 - 9000\*d\*(b\*c - a\*d

$$\begin{aligned} &)^4*(a + b*x)*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])^2 + 12000*d^2*(-(b*c) + \\ &a*d)^3*(a + b*x)^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])^2 - 6000*d^3*(b*c - \\ &a*d)^2*(a + b*x)^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])^2 - 6000*a^2*B^2*d \\ &^5*(a + b*x)^3*\text{Log}[c + d*x] - 12000*a*b*B^2*d^5*x*(a + b*x)^3*\text{Log}[c + d*x] \\ &- 6000*b^2*B^2*d^5*x^2*(a + b*x)^3*\text{Log}[c + d*x] - 30300*a*B^2*d^5*(a + b*x) \\ &^4*\text{Log}[c + d*x] - 30300*b*B^2*d^5*x*(a + b*x)^4*\text{Log}[c + d*x] + 35760*B^2*d^ \\ &5*(a + b*x)^5*\text{Log}[c + d*x] - 18000*a*B*d^5*(a + b*x)^4*(A + B*\text{Log}[(e*(a + b \\ &*x))/(c + d*x)])*\text{Log}[c + d*x] - 18000*b*B*d^5*x*(a + b*x)^4*(A + B*\text{Log}[(e*( \\ &a + b*x))/(c + d*x)])*\text{Log}[c + d*x] + 16800*B*d^5*(a + b*x)^5*(A + B*\text{Log}[(e* \\ &(a + b*x))/(c + d*x)])*\text{Log}[c + d*x] - 9000*a*B^2*d^5*(a + b*x)^4*(\text{Log}[a + b \\ &*x]*(\text{Log}[a + b*x] - 2*\text{Log}[(b*(c + d*x))/(b*c - a*d)])) - 2*\text{PolyLog}[2, (d*(a \\ &+ b*x))/(-(b*c) + a*d)] - 9000*b*B^2*d^5*x*(a + b*x)^4*(\text{Log}[a + b*x]*(\text{Log}[ \\ &a + b*x] - 2*\text{Log}[(b*(c + d*x))/(b*c - a*d)])) - 2*\text{PolyLog}[2, (d*(a + b*x))/ \\ &(-(b*c) + a*d)] + 8400*B^2*d^5*(a + b*x)^5*(\text{Log}[a + b*x]*(\text{Log}[a + b*x] - 2* \\ &\text{Log}[(b*(c + d*x))/(b*c - a*d)])) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-(b*c) + a*d) \\ &] + 9000*a*B^2*d^5*(a + b*x)^4*((2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] - \text{Log} \\ &[c + d*x])*\text{Log}[c + d*x] + 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)] + 9000*b \\ &*B^2*d^5*x*(a + b*x)^4*((2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] - \text{Log}[c + d*x] \\ &)*\text{Log}[c + d*x] + 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)] - 8400*B^2*d^5*(a \\ &+ b*x)^5*((2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] - \text{Log}[c + d*x])*\text{Log}[c + d*x \\ &] + 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])))/(12000*b^4*(b*c - a*d)^2*g^6 \\ &*(a + b*x)^5) \end{aligned}$$

**Maple [B]** time = 0.055, size = 1814, normalized size = 6.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In]  $\text{int}((d*i*x+c*i)^3*(A+B*\ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^6, x)$

[Out]  $\begin{aligned} &1/4*e^4*d^2*i^3/(a*d-b*c)^3/g^6*A^2/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^4*a \\ &-1/4*e^4*d*i^3/(a*d-b*c)^3/g^6*A^2/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^4*b* \\ &c-1/5*e^5*d*i^3/(a*d-b*c)^3/g^6*A^2*b/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^5 \\ &*a+1/5*e^5*i^3/(a*d-b*c)^3/g^6*A^2*b^2/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^ \\ &5*c+1/2*e^4*d^2*i^3/(a*d-b*c)^3/g^6*A*B/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c) \\ &^4*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-1/2*e^4*d*i^3/(a*d-b*c)^3/g^6*A*B/(b*e \\ &/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^4*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+1/8*e \\ &^4*d^2*i^3/(a*d-b*c)^3/g^6*A*B/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^4*a-1/8* \\ &e^4*d*i^3/(a*d-b*c)^3/g^6*A*B/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^4*b*c-2/5 \\ &*e^5*d*i^3/(a*d-b*c)^3/g^6*A*B*b/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^5*\ln(b \\ &*e/d+(a*d-b*c)*e/d/(d*x+c))*a+2/5*e^5*i^3/(a*d-b*c)^3/g^6*A*B*b^2/(b*e/d+e/ \end{aligned}$



$$\begin{aligned} & (d*x+c)*a-e/d/(d*x+c)*b*c)^5*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-2/25*e^5*d*i \\ & ^3/(a*d-b*c)^3/g^6*A*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*a+2/25*e^5*i \\ & ^3/(a*d-b*c)^3/g^6*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*c+1/4*e^4* \\ & d^2*i^3/(a*d-b*c)^3/g^6*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*\ln(b*e/d+ \\ & (a*d-b*c)*e/d/(d*x+c))^2*a-1/4*e^4*d*i^3/(a*d-b*c)^3/g^6*B^2/(b*e/d+e/(d*x+ \\ & c)*a-e/d/(d*x+c)*b*c)^4*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b*c+1/8*e^4*d^2*i \\ & ^3/(a*d-b*c)^3/g^6*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*\ln(b*e/d+(a*d- \\ & b*c)*e/d/(d*x+c))*a-1/8*e^4*d*i^3/(a*d-b*c)^3/g^6*B^2/(b*e/d+e/(d*x+c)*a-e/ \\ & d/(d*x+c)*b*c)^4*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+1/32*e^4*d^2*i^3/(a*d- \\ & b*c)^3/g^6*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a-1/32*e^4*d*i^3/(a*d- \\ & b*c)^3/g^6*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*b*c-1/5*e^5*d*i^3/(a*d \\ & -b*c)^3/g^6*B^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*\ln(b*e/d+(a*d-b*c)* \\ & e/d/(d*x+c))^2*a+1/5*e^5*i^3/(a*d-b*c)^3/g^6*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d \\ & /d/(d*x+c)*b*c)^5*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-2/25*e^5*d*i^3/(a*d-b*c \\ & )^3/g^6*B^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*\ln(b*e/d+(a*d-b*c)*e/d/ \\ & (d*x+c))*a+2/25*e^5*i^3/(a*d-b*c)^3/g^6*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x \\ & +c)*b*c)^5*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-2/125*e^5*d*i^3/(a*d-b*c)^3/g^ \\ & 6*B^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*a+2/125*e^5*i^3/(a*d-b*c)^3/g^ \\ & ^6*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*c \end{aligned}$$

**Maxima [B]** time = 9.61578, size = 21283, normalized size = 71.18

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^6,x, algorithm="maxima")

[Out] 
$$\begin{aligned} & -3/20*(5*b*x + a)*B^2*c^2*d*i^3*\log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^7 \\ & *g^6*x^5 + 5*a*b^6*g^6*x^4 + 10*a^2*b^5*g^6*x^3 + 10*a^3*b^4*g^6*x^2 + 5*a^ \\ & 4*b^3*g^6*x + a^5*b^2*g^6) - 1/10*(10*b^2*x^2 + 5*a*b*x + a^2)*B^2*c*d^2*i^ \\ & 3*\log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^8*g^6*x^5 + 5*a*b^7*g^6*x^4 + 1 \\ & 0*a^2*b^6*g^6*x^3 + 10*a^3*b^5*g^6*x^2 + 5*a^4*b^4*g^6*x + a^5*b^3*g^6) - 1 \\ & /20*(10*b^3*x^3 + 10*a*b^2*x^2 + 5*a^2*b*x + a^3)*B^2*d^3*i^3*\log(b*e*x/(d* \\ & x + c) + a*e/(d*x + c))^2/(b^9*g^6*x^5 + 5*a*b^8*g^6*x^4 + 10*a^2*b^7*g^6*x \\ & ^3 + 10*a^3*b^6*g^6*x^2 + 5*a^4*b^5*g^6*x + a^5*b^4*g^6) - 1/9000*(60*((60* \\ & b^4*d^4*x^4 + 12*b^4*c^4 - 63*a*b^3*c^3*d + 137*a^2*b^2*c^2*d^2 - 163*a^3*b \\ & *c*d^3 + 137*a^4*d^4 - 30*(b^4*c*d^3 - 9*a*b^3*d^4)*x^3 + 10*(2*b^4*c^2*d^2 \\ & - 13*a*b^3*c*d^3 + 47*a^2*b^2*d^4)*x^2 - 5*(3*b^4*c^3*d - 17*a*b^3*c^2*d^2 \\ & + 43*a^2*b^2*c*d^3 - 77*a^3*b*d^4)*x)/(b^10*c^4 - 4*a*b^9*c^3*d + 6*a^2*b \\ & ^8*c^2*d^2 - 4*a^3*b^7*c*d^3 + a^4*b^6*d^4)*g^6*x^5 + 5*(a*b^9*c^4 - 4*a^2* \end{aligned}$$

$$\begin{aligned}
& b^8c^3d + 6a^3b^7c^2d^2 - 4a^4b^6c^2d^3 + a^5b^5d^4)g^6x^4 + 10 \\
& *(a^2b^8c^4 - 4a^3b^7c^3d + 6a^4b^6c^2d^2 - 4a^5b^5c^2d^3 + a^6 \\
& *b^4d^4)g^6x^3 + 10*(a^3b^7c^4 - 4a^4b^6c^3d + 6a^5b^5c^2d^2 - \\
& 4a^6b^4c^2d^3 + a^7b^3d^4)g^6x^2 + 5*(a^4b^6c^4 - 4a^5b^5c^3d \\
& + 6a^6b^4c^2d^2 - 4a^7b^3c^2d^3 + a^8b^2d^4)g^6x + (a^5b^5c^4 - \\
& 4a^6b^4c^3d + 6a^7b^3c^2d^2 - 4a^8b^2c^2d^3 + a^9b^2d^4)g^6) + \\
& 60d^5\log(bx + a)/((b^6c^5 - 5a^2b^5c^4d + 10a^2b^4c^3d^2 - 10a^3 \\
& *b^3c^2d^3 + 5a^4b^2c^2d^4 - a^5b^2d^5)g^6) - 60d^5\log(dx + c)/((b^6 \\
& c^5 - 5a^2b^5c^4d + 10a^2b^4c^3d^2 - 10a^3b^3c^2d^3 + 5a^4b^2 \\
& *c^2d^4 - a^5b^2d^5)g^6))\log(b^5c^5/(dx + c) + a^5/(dx + c)) + (144b^5c \\
& ^5 - 1125a^2b^4c^4d + 4000a^2b^3c^3d^2 - 9000a^3b^2c^2d^3 + 18000 \\
& *a^4b^2c^2d^4 - 12019a^5d^5 + 8220*(b^5c^4d - a^2b^4d^5)x^4 - 30*(77b^5 \\
& c^2d^3 - 1250a^2b^4c^2d^4 + 1173a^2b^3d^5)x^3 + 10*(94b^5c^3d^2 - \\
& 975a^2b^4c^2d^3 + 6600a^2b^3c^2d^4 - 5719a^3b^2d^5)x^2 - 1800*(b^5 \\
& d^5x^5 + 5a^2b^4d^5x^4 + 10a^2b^3d^5x^3 + 10a^3b^2d^5x^2 + 5a^4 \\
& *b^2d^5x + a^5d^5)\log(bx + a)^2 - 1800*(b^5d^5x^5 + 5a^2b^4d^5x^4 + \\
& 10a^2b^3d^5x^3 + 10a^3b^2d^5x^2 + 5a^4b^2d^5x + a^5d^5)\log(dx \\
& + c)^2 - 5*(81b^5c^4d - 700a^2b^4c^3d^2 + 3000a^2b^3c^2d^3 - 1080 \\
& 0a^3b^2c^2d^4 + 8419a^4b^2d^5)x + 8220*(b^5d^5x^5 + 5a^2b^4d^5x^4 + \\
& 10a^2b^3d^5x^3 + 10a^3b^2d^5x^2 + 5a^4b^2d^5x + a^5d^5)\log(bx \\
& + a) - 60*(137b^5d^5x^5 + 685a^2b^4d^5x^4 + 1370a^2b^3d^5x^3 + 13 \\
& 70a^3b^2d^5x^2 + 685a^4b^2d^5x + 137a^5d^5 - 60*(b^5d^5x^5 + 5a^2 \\
& b^4d^5x^4 + 10a^2b^3d^5x^3 + 10a^3b^2d^5x^2 + 5a^4b^2d^5x + a^5 \\
& *d^5)\log(bx + a))\log(dx + c))/(a^5b^6c^5g^6 - 5a^6b^5c^4d^4g^6 + \\
& 10a^7b^4c^3d^2g^6 - 10a^8b^3c^2d^3g^6 + 5a^9b^2c^2d^4g^6 - a^1 \\
& 0*b^2d^5g^6 + (b^11c^5g^6 - 5a^2b^10c^4d^4g^6 + 10a^2b^9c^3d^2g^6 - \\
& 10a^3b^8c^2d^3g^6 + 5a^4b^7c^2d^4g^6 - a^5b^6d^5g^6)x^5 + 5*(a \\
& *b^10c^5g^6 - 5a^2b^9c^4d^4g^6 + 10a^3b^8c^3d^2g^6 - 10a^4b^7c^2 \\
& ^2d^3g^6 + 5a^5b^6c^2d^4g^6 - a^6b^5d^5g^6)x^4 + 10*(a^2b^9c^5g^6 \\
& - 5a^3b^8c^4d^4g^6 + 10a^4b^7c^3d^2g^6 - 10a^5b^6c^2d^3g^6 \\
& + 5a^6b^5c^2d^4g^6 - a^7b^4d^5g^6)x^3 + 10*(a^3b^8c^5g^6 - 5a^4b^7 \\
& c^4d^4g^6 + 10a^5b^6c^3d^2g^6 - 10a^6b^5c^2d^3g^6 + 5a^7b^4 \\
& *c^2d^4g^6 - a^8b^3d^5g^6)x^2 + 5*(a^4b^7c^5g^6 - 5a^5b^6c^4d^4g^6 \\
& + 10a^6b^5c^3d^2g^6 - 10a^7b^4c^2d^3g^6 + 5a^8b^3c^2d^4g^6 - \\
& a^9b^2d^5g^6)x)*B^2c^3i^3 - 1/12000*(60*((27a^2b^4c^4 - 148a^2b^ \\
& 3c^3d + 352a^3b^2c^2d^2 - 548a^4b^2c^2d^3 + 77a^5d^4 - 60*(5b^5c^ \\
& d^3 - a^2b^4d^4)x^4 + 30*(5b^5c^2d^2 - 46a^2b^4c^2d^3 + 9a^2b^3d^4)* \\
& x^3 - 10*(10b^5c^3d - 67a^2b^4c^2d^2 + 248a^2b^3c^2d^3 - 47a^3b^2c^2 \\
& d^4)x^2 + 5*(15b^5c^4 - 88a^2b^4c^3d + 232a^2b^3c^2d^2 - 428a^3b^ \\
& ^2c^2d^3 + 77a^4b^2d^4)x)/((b^11c^4 - 4a^2b^10c^3d + 6a^2b^9c^2d^2 \\
& - 4a^3b^8c^2d^3 + a^4b^7d^4)g^6x^5 + 5*(a^2b^9c^4 - 4a^2b^9c^3d \\
& + 6a^3b^8c^2d^2 - 4a^4b^7c^2d^3 + a^5b^6d^4)g^6x^4 + 10*(a^2b^9 \\
& c^4 - 4a^3b^8c^3d + 6a^4b^7c^2d^2 - 4a^5b^6c^2d^3 + a^6b^5d^4) \\
& *g^6x^3 + 10*(a^3b^8c^4 - 4a^4b^7c^3d + 6a^5b^6c^2d^2 - 4a^6b^5 \\
& c^2d^3 + a^7b^4d^4)g^6x^2 + 5*(a^4b^7c^4 - 4a^5b^6c^3d + 6a^6b^5
\end{aligned}$$

$$\begin{aligned}
& ^5c^2d^2 - 4a^7b^4c^3d^3 + a^8b^3d^4)g^6x + (a^5b^6c^4 - 4a^6b^5c^3d + 6a^7b^4c^2d^2 - 4a^8b^3c^2d^3 + a^9b^2d^4)g^6) - 60(5b^6c^2d^3 - ad^5) \log(bx + a) / ((b^7c^5 - 5a^2b^6c^4d + 10a^2b^5c^3d^2 - 10a^3b^4c^2d^3 + 5a^4b^3c^2d^4 - a^5b^2d^5)g^6) + 60(5b^6c^2d^4 - ad^5) \log(dx + c) / ((b^7c^5 - 5a^2b^6c^4d + 10a^2b^5c^3d^2 - 10a^3b^4c^2d^3 + 5a^4b^3c^2d^4 - a^5b^2d^5)g^6)) * \log(b^6ex / (dx + c) + ae / (dx + c)) + (549a^5b^5c^5 - 4625a^2b^4c^4d + 19000a^3b^3c^3d^2 - 63000a^4b^2c^2d^3 + 51875a^5b^2c^2d^4 - 3799a^6d^5 - 60(625b^6c^2d^3 - 702a^2b^5c^2d^4 + 77a^2b^4d^5) * x^4 + 30(325b^6c^3d^2 - 5667a^2b^5c^2d^3 + 5975a^2b^4c^2d^4 - 633a^3b^3d^5) * x^3 - 10(350b^6c^4d - 3949a^2b^5c^3d^2 + 29475a^2b^4c^2d^3 - 28775a^3b^3c^2d^4 + 2899a^4b^2d^5) * x^2 + 1800(5a^5b^2c^2d^4 - a^6d^5 + (5b^6c^2d^4 - ab^5d^5) * x^5 + 5(5a^2b^5c^2d^4 - a^2b^4d^5) * x^4 + 10(5a^2b^4c^2d^4 - a^3b^3d^5) * x^3 + 10(5a^3b^3c^2d^4 - a^4b^2d^5) * x^2 + 5(5a^4b^2c^2d^4 - a^5b^2d^5) * x) * \log(bx + a)^2 + 1800(5a^5b^2c^2d^4 - a^6d^5 + (5b^6c^2d^4 - ab^5d^5) * x^5 + 5(5a^2b^5c^2d^4 - a^2b^4d^5) * x^4 + 10(5a^2b^4c^2d^4 - a^3b^3d^5) * x^3 + 10(5a^3b^3c^2d^4 - a^4b^2d^5) * x^2 + 5(5a^4b^2c^2d^4 - a^5b^2d^5) * x) * \log(dx + c)^2 + 5(225b^6c^5 - 2201a^2b^5c^4d + 10900a^2b^4c^3d^2 - 46200a^3b^3c^2d^3 + 41075a^4b^2c^2d^4 - 3799a^5b^2d^5) * x - 60(625a^5b^2c^2d^4 - 77a^6d^5 + (625b^6c^2d^4 - 77a^2b^5d^5) * x^5 + 5(625a^2b^5c^2d^4 - 77a^2b^4d^5) * x^4 + 10(625a^2b^4c^2d^4 - 77a^3b^3d^5) * x^3 + 10(625a^4b^2c^2d^4 - 77a^5b^2d^5) * x) * \log(bx + a) + 60(625a^5b^2c^2d^4 - 77a^6d^5 + (625b^6c^2d^4 - 77a^2b^5d^5) * x^5 + 5(625a^2b^5c^2d^4 - 77a^2b^4d^5) * x^4 + 10(625a^2b^4c^2d^4 - 77a^3b^3d^5) * x^3 + 10(625a^4b^2c^2d^4 - 77a^5b^2d^5) * x) * \log(bx + a)) * \log(dx + c) / (a^5b^7c^5g^6 - 5a^6b^6c^4d^4g^6 + 10a^7b^5c^3d^2g^6 - 10a^8b^4c^2d^3g^6 + 5a^9b^3c^2d^4g^6 - a^10b^2d^5g^6 + (b^12c^5g^6 - 5a^2b^11c^4d^4g^6 + 10a^2b^10c^3d^2g^6 - 10a^3b^9c^2d^3g^6 + 5a^4b^8c^2d^4g^6 - a^5b^7d^5g^6) * x^5 + 5(a^2b^11c^5g^6 - 5a^2b^10c^4d^4g^6 + 10a^3b^9c^3d^2g^6 - 10a^4b^8c^2d^3g^6 + 5a^5b^7c^2d^4g^6 - a^6b^6d^5g^6) * x^4 + 10(a^2b^10c^5g^6 - 5a^3b^9c^4d^4g^6 + 10a^4b^8c^3d^2g^6 - 10a^5b^7c^2d^3g^6 + 5a^6b^6c^2d^4g^6 - a^7b^5d^5g^6) * x^3 + 10(a^3b^9c^5g^6 - 5a^4b^8c^4d^4g^6 + 10a^5b^7c^3d^2g^6 - 10a^6b^6c^2d^3g^6 + 5a^7b^5c^2d^4g^6 - a^8b^4d^5g^6) * x^2 + 5(a^4b^8c^5g^6 - 5a^5b^7c^4d^4g^6 + 10a^6b^6c^3d^2g^6 - 10a^7b^5c^2d^3g^6 + 5a^8b^4c^2d^4g^6 - a^9b^3d^5g^6) * x) * B^2c^2d^3i^3 - 1/18000(60((47a^2b^4c^4 - 278a^3b^3c^3d + 822a^4b^2c^2d^2 - 278a^5b^2c^2d^3 + 47a^6d^4 + 60(10b^6c^2d^2 - 5a^2b^5c^2d^3 + a^2b^4d^4) * x^4 - 30(10b^6c^3d - 95a^2b^5c^2d^2 + 46a^2b^4c^2d^3 - 9a^3b^3d^4) * x^3 + 10(20b^6c^4 - 140a^2b^5c^3d + 537a^2b^4c^2d^2 - 248a^3b^3c^2d^3 + 47a^4b^2d^4) * x^2 + 5
\end{aligned}$$

$$\begin{aligned}
&*(35*a*b^5*c^4 - 218*a^2*b^4*c^3*d + 702*a^3*b^3*c^2*d^2 - 278*a^4*b^2*c*d^3 + 47*a^5*b*d^4)*x)/((b^12*c^4 - 4*a*b^11*c^3*d + 6*a^2*b^10*c^2*d^2 - 4*a^3*b^9*c*d^3 + a^4*b^8*d^4)*g^6*x^5 + 5*(a*b^11*c^4 - 4*a^2*b^10*c^3*d + 6*a^3*b^9*c^2*d^2 - 4*a^4*b^8*c*d^3 + a^5*b^7*d^4)*g^6*x^4 + 10*(a^2*b^10*c^4 - 4*a^3*b^9*c^3*d + 6*a^4*b^8*c^2*d^2 - 4*a^5*b^7*c*d^3 + a^6*b^6*d^4)*g^6*x^3 + 10*(a^3*b^9*c^4 - 4*a^4*b^8*c^3*d + 6*a^5*b^7*c^2*d^2 - 4*a^6*b^6*c*d^3 + a^7*b^5*d^4)*g^6*x^2 + 5*(a^4*b^8*c^4 - 4*a^5*b^7*c^3*d + 6*a^6*b^6*c^2*d^2 - 4*a^7*b^5*c*d^3 + a^8*b^4*d^4)*g^6*x + (a^5*b^7*c^4 - 4*a^6*b^6*c^3*d + 6*a^7*b^5*c^2*d^2 - 4*a^8*b^4*c*d^3 + a^9*b^3*d^4)*g^6) + 60*(10*b^2*c^2*d^3 - 5*a*b*c*d^4 + a^2*d^5)*log(b*x + a)/((b^8*c^5 - 5*a*b^7*c^4*d + 10*a^2*b^6*c^3*d^2 - 10*a^3*b^5*c^2*d^3 + 5*a^4*b^4*c*d^4 - a^5*b^3*d^5)*g^6) - 60*(10*b^2*c^2*d^3 - 5*a*b*c*d^4 + a^2*d^5)*log(d*x + c)/((b^8*c^5 - 5*a*b^7*c^4*d + 10*a^2*b^6*c^3*d^2 - 10*a^3*b^5*c^2*d^3 + 5*a^4*b^4*c*d^4 - a^5*b^3*d^5)*g^6))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + (1489*a^2*b^5*c^5 - 14375*a^3*b^4*c^4*d + 85000*a^4*b^3*c^3*d^2 - 85000*a^5*b^2*c^2*d^3 + 14375*a^6*b*c*d^4 - 1489*a^7*d^5 + 60*(1100*b^7*c^3*d^2 - 1425*a*b^6*c^2*d^3 + 372*a^2*b^5*c*d^4 - 47*a^3*b^4*d^5)*x^4 - 30*(500*b^7*c^4*d - 9825*a*b^6*c^3*d^2 + 11937*a^2*b^5*c^2*d^3 - 2975*a^3*b^4*c*d^4 + 363*a^4*b^3*d^5)*x^3 + 10*(400*b^7*c^5 - 5450*a*b^6*c^4*d + 49189*a^2*b^5*c^3*d^2 - 55525*a^3*b^4*c^2*d^3 + 12875*a^4*b^3*c*d^4 - 1489*a^5*b^2*d^5)*x^2 - 1800*(10*a^5*b^2*c^2*d^3 - 5*a^6*b*c*d^4 + a^7*d^5 + (10*b^7*c^2*d^3 - 5*a*b^6*c*d^4 + a^2*b^5*d^5)*x^5 + 5*(10*a*b^6*c^2*d^3 - 5*a^2*b^5*c*d^4 + a^3*b^4*d^5)*x^4 + 10*(10*a^2*b^5*c^2*d^3 - 5*a^3*b^4*c*d^4 + a^4*b^3*d^5)*x^3 + 10*(10*a^3*b^4*c^2*d^3 - 5*a^4*b^3*c*d^4 + a^5*b^2*d^5)*x^2 + 5*(10*a^4*b^3*c^2*d^3 - 5*a^5*b^2*c*d^4 + a^6*b*d^5)*x)*log(b*x + a)^2 - 1800*(10*a^5*b^2*c^2*d^3 - 5*a^6*b*c*d^4 + a^7*d^5 + (10*b^7*c^2*d^3 - 5*a*b^6*c*d^4 + a^2*b^5*d^5)*x^5 + 5*(10*a*b^6*c^2*d^3 - 5*a^2*b^5*c*d^4 + a^3*b^4*d^5)*x^4 + 10*(10*a^2*b^5*c^2*d^3 - 5*a^3*b^4*c*d^4 + a^4*b^3*d^5)*x^3 + 10*(10*a^3*b^4*c^2*d^3 - 5*a^4*b^3*c*d^4 + a^5*b^2*d^5)*x^2 + 5*(10*a^4*b^3*c^2*d^3 - 5*a^5*b^2*c*d^4 + a^6*b*d^5)*x)*log(d*x + c)^2 + 5*(925*a*b^6*c^5 - 9911*a^2*b^5*c^4*d + 67900*a^3*b^4*c^3*d^2 - 71800*a^4*b^3*c^2*d^3 + 14375*a^5*b^2*c*d^4 - 1489*a^6*b*d^5)*x + 60*(1100*a^5*b^2*c^2*d^3 - 325*a^6*b*c*d^4 + 47*a^7*d^5 + (1100*b^7*c^2*d^3 - 325*a*b^6*c*d^4 + 47*a^2*b^5*d^5)*x^5 + 5*(1100*a*b^6*c^2*d^3 - 325*a^2*b^5*c*d^4 + 47*a^3*b^4*d^5)*x^4 + 10*(1100*a^2*b^5*c^2*d^3 - 325*a^3*b^4*c*d^4 + 47*a^4*b^3*d^5)*x^3 + 10*(1100*a^3*b^4*c^2*d^3 - 325*a^4*b^3*c*d^4 + 47*a^5*b^2*d^5)*x^2 + 5*(1100*a^4*b^3*c^2*d^3 - 325*a^5*b^2*c*d^4 + 47*a^6*b*d^5)*x)*log(b*x + a) - 60*(1100*a^5*b^2*c^2*d^3 - 325*a^6*b*c*d^4 + 47*a^7*d^5 + (1100*b^7*c^2*d^3 - 325*a*b^6*c*d^4 + 47*a^2*b^5*d^5)*x^5 + 5*(1100*a*b^6*c^2*d^3 - 325*a^2*b^5*c*d^4 + 47*a^3*b^4*d^5)*x^4 + 10*(1100*a^2*b^5*c^2*d^3 - 325*a^3*b^4*c*d^4 + 47*a^4*b^3*d^5)*x^3 + 10*(1100*a^3*b^4*c^2*d^3 - 325*a^4*b^3*c*d^4 + 47*a^5*b^2*d^5)*x^2 + 5*(1100*a^4*b^3*c^2*d^3 - 325*a^5*b^2*c*d^4 + 47*a^6*b*d^5)*x - 60*(10*a^5*b^2*c^2*d^3 - 5*a^6*b*c*d^4 + a^7*d^5 + (10*b^7*c^2*d^3 - 5*a*b^6*c*d^4 + a^2*b^5*d^5)*x^5 + 5*(10*a*b^6*c^2*d^3 - 5*a^2*b^5*c*d^4 + a^3*b^4*d^5)*x^4 + 10*(10*a^2*b^5*c^2*d^3 - 5*a^3*b^4*c*d^4 + a^4*b^3*d^5)*x^3 + 10*(10*a^3*b^4*c^2*d^3 - 5*
\end{aligned}$$

$$\begin{aligned}
& a^4 b^3 c^2 d^4 + a^5 b^2 d^5) x^2 + 5(10 a^4 b^3 c^2 d^3 - 5 a^5 b^2 c^2 d^4 \\
& + a^6 b^2 d^5) x) \log(bx + a) \log(dx + c) / (a^5 b^8 c^5 g^6 - 5 a^6 b^7 c^4 d^4 g^6 + 10 a^7 b^6 c^3 d^2 g^6 - 10 a^8 b^5 c^2 d^3 g^6 + 5 a^9 b^4 c^2 d^4 g^6 - a^{10} b^3 d^5 g^6 + (b^{13} c^5 g^6 - 5 a^2 b^{12} c^4 d g^6 + 10 a^2 b^{11} c^3 d^2 g^6 - 10 a^3 b^{10} c^2 d^3 g^6 + 5 a^4 b^9 c^2 d^4 g^6 - a^5 b^8 d^5 g^6) x^5 + 5(a^2 b^{12} c^5 g^6 - 5 a^2 b^{11} c^4 d g^6 + 10 a^3 b^{10} c^3 d^2 g^6 - 10 a^4 b^9 c^2 d^3 g^6 + 5 a^5 b^8 c^2 d^4 g^6 - a^6 b^7 d^5 g^6) x^4 + 10(a^2 b^{11} c^5 g^6 - 5 a^3 b^{10} c^4 d g^6 + 10 a^4 b^9 c^3 d^2 g^6 - 10 a^5 b^8 c^2 d^3 g^6 + 5 a^6 b^7 c^2 d^4 g^6 - a^7 b^6 d^5 g^6) x^3 + 10(a^3 b^{10} c^5 g^6 - 5 a^4 b^9 c^4 d g^6 + 10 a^5 b^8 c^3 d^2 g^6 - 10 a^6 b^7 c^2 d^3 g^6 + 5 a^7 b^6 c^2 d^4 g^6 - a^8 b^5 d^5 g^6) x^2 + 5(a^4 b^9 c^5 g^6 - 5 a^5 b^8 c^4 d g^6 + 10 a^6 b^7 c^3 d^2 g^6 - 10 a^7 b^6 c^2 d^3 g^6 + 5 a^8 b^5 c^2 d^4 g^6 - a^9 b^4 d^5 g^6) x) * B^2 c^2 d^2 i^3 - 1/36000 * (60 * ((77 a^3 b^4 c^4 - 548 a^4 b^3 c^3 d + 352 a^5 b^2 c^2 d^2 - 148 a^6 b^2 c^2 d^3 + 27 a^7 d^4 - 60 * (10 b^7 c^3 d - 10 a b^6 c^2 d^2 + 5 a^2 b^5 c^2 d^3 - a^3 b^4 d^4) x^4 + 30 * (10 b^7 c^4 - 100 a b^6 c^3 d + 95 a^2 b^5 c^2 d^2 - 46 a^3 b^4 c^2 d^3 + 9 a^4 b^3 d^4) x^3 + 10 * (50 a b^6 c^4 - 410 a^2 b^5 c^3 d + 337 a^3 b^4 c^2 d^2 - 148 a^4 b^3 c^2 d^3 + 27 a^5 b^2 d^4) x^2 + 5 * (65 a^2 b^5 c^4 - 488 a^3 b^4 c^3 d + 352 a^4 b^3 c^2 d^2 - 148 a^5 b^2 c^2 d^3 + 27 a^6 b^2 d^4) x) / ((b^{13} c^4 - 4 a^2 b^{12} c^3 d + 6 a^2 b^{11} c^2 d^2 - 4 a^3 b^{10} c^2 d^3 + a^4 b^9 d^4) g^6 x^5 + 5(a^2 b^{12} c^4 - 4 a^2 b^{11} c^3 d + 6 a^3 b^{10} c^2 d^2 - 4 a^4 b^9 c^2 d^3 + a^5 b^8 d^4) g^6 x^4 + 10(a^2 b^{11} c^4 - 4 a^3 b^{10} c^3 d + 6 a^4 b^9 c^2 d^2 - 4 a^5 b^8 c^2 d^3 + a^6 b^7 d^4) g^6 x^3 + 10(a^3 b^{10} c^4 - 4 a^4 b^9 c^3 d + 6 a^5 b^8 c^2 d^2 - 4 a^6 b^7 c^2 d^3 + a^7 b^6 d^4) g^6 x^2 + 5(a^4 b^9 c^4 - 4 a^5 b^8 c^3 d + 6 a^6 b^7 c^2 d^2 - 4 a^7 b^6 c^2 d^3 + a^8 b^5 d^4) g^6 x + (a^5 b^8 c^4 - 4 a^6 b^7 c^3 d + 6 a^7 b^6 c^2 d^2 - 4 a^8 b^5 c^2 d^3 + a^9 b^4 d^4) g^6) - 60 * (10 b^3 c^3 d^2 - 10 a b^2 c^2 d^3 + 5 a^2 b^2 c^2 d^4 - a^3 d^5) * log(bx + a) / ((b^9 c^5 - 5 a^2 b^8 c^4 d + 10 a^2 b^7 c^3 d^2 - 10 a^3 b^6 c^2 d^3 + 5 a^4 b^5 c^2 d^4 - a^5 b^4 d^5) g^6) + 60 * (10 b^3 c^3 d^2 - 10 a b^2 c^2 d^3 + 5 a^2 b^2 c^2 d^4 - a^3 d^5) * log(dx + c) / ((b^9 c^5 - 5 a^2 b^8 c^4 d + 10 a^2 b^7 c^3 d^2 - 10 a^3 b^6 c^2 d^3 + 5 a^4 b^5 c^2 d^4 - a^5 b^4 d^5) g^6)) * log(b * e * x / (dx + c)) + a * e / (dx + c) + (3799 a^3 b^5 c^5 - 51875 a^4 b^4 c^4 d + 63000 a^5 b^3 c^3 d^2 - 19000 a^6 b^2 c^2 d^3 + 4625 a^7 b^2 c^2 d^4 - 549 a^8 d^5 - 60 * (900 b^8 c^4 d - 1400 a b^7 c^3 d^2 + 675 a^2 b^6 c^2 d^3 - 202 a^3 b^5 c^2 d^4 + 27 a^4 b^4 d^5) x^4 + 30 * (300 b^8 c^5 - 7700 a b^7 c^4 d + 11175 a^2 b^6 c^3 d^2 - 5017 a^3 b^5 c^2 d^3 + 1425 a^4 b^4 c^2 d^4 - 183 a^5 b^3 d^5) x^3 + 10 * (1900 a b^7 c^5 - 33950 a^2 b^6 c^4 d + 45999 a^3 b^5 c^3 d^2 - 18025 a^4 b^4 c^2 d^3 + 4625 a^5 b^3 c^2 d^4 - 549 a^6 b^2 d^5) x^2 + 1800 * (10 a^5 b^3 c^3 d^2 - 10 a^6 b^2 c^2 d^3 + 5 a^7 b^2 c^2 d^4 - a^8 d^5 + (10 b^8 c^3 d^2 - 10 a^2 b^7 c^2 d^3 + 5 a^3 b^6 c^2 d^4 - a^4 b^5 d^5) x^5 + 5 * (10 a^2 b^7 c^3 d^2 - 10 a^3 b^6 c^2 d^3 + 5 a^4 b^5 c^2 d^4 - a^5 b^4 d^5) x^4 + 10 * (10 a^2 b^6 c^3 d^2 - 10 a^3 b^5 c^2 d^3 + 5 a^4 b^4 c^2 d^4 - a^5 b^3 d^5) x^3 + 10 * (10 a^3 b^5 c^3 d^2 - 10 a^4 b^4 c^2 d^3 + 5 a^5 b^3 c^2 d^4 - a^6 b^2 d^5) x^2 + 5 * (10 a^4 b^4 c^3 d^2 - 10 a^5 b^3 c^2 d^3 + 5 a^6 b^2 c^2 d^4 - a^7 b^2 d^5) *
\end{aligned}$$

$$\begin{aligned}
& x) \cdot \log(b \cdot x + a)^2 + 1800 \cdot (10 \cdot a^5 \cdot b^3 \cdot c^3 \cdot d^2 - 10 \cdot a^6 \cdot b^2 \cdot c^2 \cdot d^3 + 5 \cdot a^7 \cdot b \\
& \cdot c \cdot d^4 - a^8 \cdot d^5 + (10 \cdot b^8 \cdot c^3 \cdot d^2 - 10 \cdot a \cdot b^7 \cdot c^2 \cdot d^3 + 5 \cdot a^2 \cdot b^6 \cdot c \cdot d^4 - a \\
& ^3 \cdot b^5 \cdot d^5) \cdot x^5 + 5 \cdot (10 \cdot a \cdot b^7 \cdot c^3 \cdot d^2 - 10 \cdot a^2 \cdot b^6 \cdot c^2 \cdot d^3 + 5 \cdot a^3 \cdot b^5 \cdot c \cdot d^4 \\
& - a^4 \cdot b^4 \cdot d^5) \cdot x^4 + 10 \cdot (10 \cdot a^2 \cdot b^6 \cdot c^3 \cdot d^2 - 10 \cdot a^3 \cdot b^5 \cdot c^2 \cdot d^3 + 5 \cdot a^4 \cdot b^4 \\
& \cdot c \cdot d^4 - a^5 \cdot b^3 \cdot d^5) \cdot x^3 + 10 \cdot (10 \cdot a^3 \cdot b^5 \cdot c^3 \cdot d^2 - 10 \cdot a^4 \cdot b^4 \cdot c^2 \cdot d^3 \\
& + 5 \cdot a^5 \cdot b^3 \cdot c \cdot d^4 - a^6 \cdot b^2 \cdot d^5) \cdot x^2 + 5 \cdot (10 \cdot a^4 \cdot b^4 \cdot c^3 \cdot d^2 - 10 \cdot a^5 \cdot b^3 \cdot c \\
& ^2 \cdot d^3 + 5 \cdot a^6 \cdot b^2 \cdot c \cdot d^4 - a^7 \cdot b \cdot d^5) \cdot x) \cdot \log(d \cdot x + c)^2 + 5 \cdot (2875 \cdot a^2 \cdot b^6 \cdot c \\
& ^5 - 43451 \cdot a^3 \cdot b^5 \cdot c^4 \cdot d + 55500 \cdot a^4 \cdot b^4 \cdot c^3 \cdot d^2 - 19000 \cdot a^5 \cdot b^3 \cdot c^2 \cdot d^3 + \\
& 4625 \cdot a^6 \cdot b^2 \cdot c \cdot d^4 - 549 \cdot a^7 \cdot b \cdot d^5) \cdot x - 60 \cdot (900 \cdot a^5 \cdot b^3 \cdot c^3 \cdot d^2 - 500 \cdot a^6 \cdot b \\
& ^2 \cdot c^2 \cdot d^3 + 175 \cdot a^7 \cdot b \cdot c \cdot d^4 - 27 \cdot a^8 \cdot d^5 + (900 \cdot b^8 \cdot c^3 \cdot d^2 - 500 \cdot a \cdot b^7 \cdot c^2 \\
& ^2 \cdot d^3 + 175 \cdot a^2 \cdot b^6 \cdot c \cdot d^4 - 27 \cdot a^3 \cdot b^5 \cdot d^5) \cdot x^5 + 5 \cdot (900 \cdot a \cdot b^7 \cdot c^3 \cdot d^2 - 50 \\
& 0 \cdot a^2 \cdot b^6 \cdot c^2 \cdot d^3 + 175 \cdot a^3 \cdot b^5 \cdot c \cdot d^4 - 27 \cdot a^4 \cdot b^4 \cdot d^5) \cdot x^4 + 10 \cdot (900 \cdot a^2 \cdot b \\
& ^6 \cdot c^3 \cdot d^2 - 500 \cdot a^3 \cdot b^5 \cdot c^2 \cdot d^3 + 175 \cdot a^4 \cdot b^4 \cdot c \cdot d^4 - 27 \cdot a^5 \cdot b^3 \cdot d^5) \cdot x^3 \\
& + 10 \cdot (900 \cdot a^3 \cdot b^5 \cdot c^3 \cdot d^2 - 500 \cdot a^4 \cdot b^4 \cdot c^2 \cdot d^3 + 175 \cdot a^5 \cdot b^3 \cdot c \cdot d^4 - 27 \cdot a^6 \\
& \cdot b^2 \cdot d^5) \cdot x^2 + 5 \cdot (900 \cdot a^4 \cdot b^4 \cdot c^3 \cdot d^2 - 500 \cdot a^5 \cdot b^3 \cdot c^2 \cdot d^3 + 175 \cdot a^6 \cdot b^2 \\
& \cdot c \cdot d^4 - 27 \cdot a^7 \cdot b \cdot d^5) \cdot x) \cdot \log(b \cdot x + a) + 60 \cdot (900 \cdot a^5 \cdot b^3 \cdot c^3 \cdot d^2 - 500 \cdot a^6 \cdot b \\
& ^2 \cdot c^2 \cdot d^3 + 175 \cdot a^7 \cdot b \cdot c \cdot d^4 - 27 \cdot a^8 \cdot d^5 + (900 \cdot b^8 \cdot c^3 \cdot d^2 - 500 \cdot a \cdot b^7 \cdot c^2 \\
& ^2 \cdot d^3 + 175 \cdot a^2 \cdot b^6 \cdot c \cdot d^4 - 27 \cdot a^3 \cdot b^5 \cdot d^5) \cdot x^5 + 5 \cdot (900 \cdot a \cdot b^7 \cdot c^3 \cdot d^2 - 5 \\
& 00 \cdot a^2 \cdot b^6 \cdot c^2 \cdot d^3 + 175 \cdot a^3 \cdot b^5 \cdot c \cdot d^4 - 27 \cdot a^4 \cdot b^4 \cdot d^5) \cdot x^4 + 10 \cdot (900 \cdot a^2 \cdot b \\
& ^6 \cdot c^3 \cdot d^2 - 500 \cdot a^3 \cdot b^5 \cdot c^2 \cdot d^3 + 175 \cdot a^4 \cdot b^4 \cdot c \cdot d^4 - 27 \cdot a^5 \cdot b^3 \cdot d^5) \cdot x^3 \\
& + 10 \cdot (900 \cdot a^3 \cdot b^5 \cdot c^3 \cdot d^2 - 500 \cdot a^4 \cdot b^4 \cdot c^2 \cdot d^3 + 175 \cdot a^5 \cdot b^3 \cdot c \cdot d^4 - 27 \cdot a \\
& ^6 \cdot b^2 \cdot d^5) \cdot x^2 + 5 \cdot (900 \cdot a^4 \cdot b^4 \cdot c^3 \cdot d^2 - 500 \cdot a^5 \cdot b^3 \cdot c^2 \cdot d^3 + 175 \cdot a^6 \cdot b^2 \\
& \cdot c \cdot d^4 - 27 \cdot a^7 \cdot b \cdot d^5) \cdot x - 60 \cdot (10 \cdot a^5 \cdot b^3 \cdot c^3 \cdot d^2 - 10 \cdot a^6 \cdot b^2 \cdot c^2 \cdot d^3 + 5 \\
& \cdot a^7 \cdot b \cdot c \cdot d^4 - a^8 \cdot d^5 + (10 \cdot b^8 \cdot c^3 \cdot d^2 - 10 \cdot a \cdot b^7 \cdot c^2 \cdot d^3 + 5 \cdot a^2 \cdot b^6 \cdot c \cdot d^4 \\
& - a^3 \cdot b^5 \cdot d^5) \cdot x^5 + 5 \cdot (10 \cdot a \cdot b^7 \cdot c^3 \cdot d^2 - 10 \cdot a^2 \cdot b^6 \cdot c^2 \cdot d^3 + 5 \cdot a^3 \cdot b^5 \\
& \cdot c \cdot d^4 - a^4 \cdot b^4 \cdot d^5) \cdot x^4 + 10 \cdot (10 \cdot a^2 \cdot b^6 \cdot c^3 \cdot d^2 - 10 \cdot a^3 \cdot b^5 \cdot c^2 \cdot d^3 + \\
& 5 \cdot a^4 \cdot b^4 \cdot c \cdot d^4 - a^5 \cdot b^3 \cdot d^5) \cdot x^3 + 10 \cdot (10 \cdot a^3 \cdot b^5 \cdot c^3 \cdot d^2 - 10 \cdot a^4 \cdot b^4 \cdot c^2 \\
& ^2 \cdot d^3 + 5 \cdot a^5 \cdot b^3 \cdot c \cdot d^4 - a^6 \cdot b^2 \cdot d^5) \cdot x^2 + 5 \cdot (10 \cdot a^4 \cdot b^4 \cdot c^3 \cdot d^2 - 10 \cdot a^5 \\
& \cdot b^3 \cdot c^2 \cdot d^3 + 5 \cdot a^6 \cdot b^2 \cdot c \cdot d^4 - a^7 \cdot b \cdot d^5) \cdot x) \cdot \log(b \cdot x + a) \cdot \log(d \cdot x + c) / \\
& (a^5 \cdot b^9 \cdot c^5 \cdot g^6 - 5 \cdot a^6 \cdot b^8 \cdot c^4 \cdot d \cdot g^6 + 10 \cdot a^7 \cdot b^7 \cdot c^3 \cdot d^2 \cdot g^6 - 10 \cdot a^8 \cdot b^6 \\
& \cdot c^2 \cdot d^3 \cdot g^6 + 5 \cdot a^9 \cdot b^5 \cdot c \cdot d^4 \cdot g^6 - a^{10} \cdot b^4 \cdot d^5 \cdot g^6 + (b^{14} \cdot c^5 \cdot g^6 - 5 \cdot \\
& a \cdot b^{13} \cdot c^4 \cdot d \cdot g^6 + 10 \cdot a^2 \cdot b^{12} \cdot c^3 \cdot d^2 \cdot g^6 - 10 \cdot a^3 \cdot b^{11} \cdot c^2 \cdot d^3 \cdot g^6 + 5 \cdot a^4 \\
& \cdot b^{10} \cdot c \cdot d^4 \cdot g^6 - a^5 \cdot b^9 \cdot d^5 \cdot g^6) \cdot x^5 + 5 \cdot (a \cdot b^{13} \cdot c^5 \cdot g^6 - 5 \cdot a^2 \cdot b^{12} \cdot c^4 \\
& \cdot d \cdot g^6 + 10 \cdot a^3 \cdot b^{11} \cdot c^3 \cdot d^2 \cdot g^6 - 10 \cdot a^4 \cdot b^{10} \cdot c^2 \cdot d^3 \cdot g^6 + 5 \cdot a^5 \cdot b^9 \cdot c \cdot d^4 \\
& \cdot g^6 - a^6 \cdot b^8 \cdot d^5 \cdot g^6) \cdot x^4 + 10 \cdot (a^2 \cdot b^{12} \cdot c^5 \cdot g^6 - 5 \cdot a^3 \cdot b^{11} \cdot c^4 \cdot d \cdot g^6 \\
& + 10 \cdot a^4 \cdot b^{10} \cdot c^3 \cdot d^2 \cdot g^6 - 10 \cdot a^5 \cdot b^9 \cdot c^2 \cdot d^3 \cdot g^6 + 5 \cdot a^6 \cdot b^8 \cdot c \cdot d^4 \cdot g^6 - \\
& a^7 \cdot b^7 \cdot d^5 \cdot g^6) \cdot x^3 + 10 \cdot (a^3 \cdot b^{11} \cdot c^5 \cdot g^6 - 5 \cdot a^4 \cdot b^{10} \cdot c^4 \cdot d \cdot g^6 + 10 \cdot a^5 \\
& \cdot b^9 \cdot c^3 \cdot d^2 \cdot g^6 - 10 \cdot a^6 \cdot b^8 \cdot c^2 \cdot d^3 \cdot g^6 + 5 \cdot a^7 \cdot b^7 \cdot c \cdot d^4 \cdot g^6 - a^8 \cdot b^6 \cdot \\
& d^5 \cdot g^6) \cdot x^2 + 5 \cdot (a^4 \cdot b^{10} \cdot c^5 \cdot g^6 - 5 \cdot a^5 \cdot b^9 \cdot c^4 \cdot d \cdot g^6 + 10 \cdot a^6 \cdot b^8 \cdot c^3 \cdot d^2 \\
& \cdot g^6 - 10 \cdot a^7 \cdot b^7 \cdot c^2 \cdot d^3 \cdot g^6 + 5 \cdot a^8 \cdot b^6 \cdot c \cdot d^4 \cdot g^6 - a^9 \cdot b^5 \cdot d^5 \cdot g^6) \cdot x) \\
& ) \cdot B^2 \cdot d^3 \cdot i^3 - 1/600 \cdot A \cdot B \cdot d^3 \cdot i^3 \cdot (60 \cdot (10 \cdot b^3 \cdot x^3 + 10 \cdot a \cdot b^2 \cdot x^2 + 5 \cdot a^2 \cdot b \cdot \\
& x + a^3) \cdot \log(b \cdot e \cdot x / (d \cdot x + c) + a \cdot e / (d \cdot x + c)) / (b^9 \cdot g^6 \cdot x^5 + 5 \cdot a \cdot b^8 \cdot g^6 \cdot x^4 \\
& + 10 \cdot a^2 \cdot b^7 \cdot g^6 \cdot x^3 + 10 \cdot a^3 \cdot b^6 \cdot g^6 \cdot x^2 + 5 \cdot a^4 \cdot b^5 \cdot g^6 \cdot x + a^5 \cdot b^4 \cdot g^6 \\
& ) + (77 \cdot a^3 \cdot b^4 \cdot c^4 - 548 \cdot a^4 \cdot b^3 \cdot c^3 \cdot d + 352 \cdot a^5 \cdot b^2 \cdot c^2 \cdot d^2 - 148 \cdot a^6 \cdot b \cdot c \\
& \cdot d^3 + 27 \cdot a^7 \cdot d^4 - 60 \cdot (10 \cdot b^7 \cdot c^3 \cdot d - 10 \cdot a \cdot b^6 \cdot c^2 \cdot d^2 + 5 \cdot a^2 \cdot b^5 \cdot c \cdot d^3 -
\end{aligned}$$

$$\begin{aligned}
& a^3b^4d^4)x^4 + 30(10b^7c^4 - 100a*b^6c^3d + 95a^2b^5c^2d^2 - \\
& 46a^3b^4c^3d^3 + 9a^4b^3d^4)x^3 + 10(50a*b^6c^4 - 410a^2b^5c^3 \\
& *d + 337a^3b^4c^2d^2 - 148a^4b^3c^3d + 27a^5b^2d^4)x^2 + 5(65a^2b^5c^4 - \\
& 488a^3b^4c^3d + 352a^4b^3c^2d^2 - 148a^5b^2c^3d + 27a^6b^1d^4)x \\
& /((b^{13}c^4 - 4a*b^{12}c^3d + 6a^2b^{11}c^2d^2 - 4a^3b^{10}c^3d + a^4b^9d^4)*g^6x^5 + \\
& 5(a*b^{12}c^4 - 4a^2b^{11}c^3d + 6a^3b^{10}c^2d^2 - 4a^4b^9c^3d + a^5b^8d^4)*g^6x^4 + \\
& 10(a^2b^{11}c^4 - 4a^3b^{10}c^3d + 6a^4b^9c^2d^2 - 4a^5b^8c^3d + a^6b^7d^4)*g^6 \\
& *x^3 + 10(a^3b^{10}c^4 - 4a^4b^9c^3d + 6a^5b^8c^2d^2 - 4a^6b^7c^3d + a^7b^6d^4)*g^6x^2 + \\
& 5(a^4b^9c^4 - 4a^5b^8c^3d + 6a^6b^7c^2d^2 - 4a^7b^6c^3d + a^8b^5d^4)*g^6x + \\
& (a^5b^8c^4 - 4a^6b^7c^3d + 6a^7b^6c^2d^2 - 4a^8b^5c^3d + a^9b^4d^4)*g^6) - 60(10b^3 \\
& *c^3d^2 - 10a*b^2c^2d^3 + 5a^2b*c^3d^4 - a^3d^5)*\log(b*x + a)/((b^9c^5 - \\
& 5a*b^8c^4d + 10a^2b^7c^3d^2 - 10a^3b^6c^2d^3 + 5a^4b^5c^1d^4 - a^5b^4d^5)*g^6) + \\
& 60(10b^3c^3d^2 - 10a*b^2c^2d^3 + 5a^2b*c^3d^4 - a^3d^5)*\log(d*x + c)/((b^9c^5 - \\
& 5a*b^8c^4d + 10a^2b^7c^3d^2 - 10a^3b^6c^2d^3 + 5a^4b^5c^1d^4 - a^5b^4d^5)*g^6)) - \\
& 1/300A*B*c^2d^2i^3(60(10b^2*x^2 + 5a*b*x + a^2)*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) \\
& )/(b^8g^6x^5 + 5a*b^7g^6x^4 + 10a^2b^6g^6x^3 + 10a^3b^5g^6x^2 + 5a^4b^4g^6x + \\
& a^5b^3g^6) + (47a^2b^4c^4 - 278a^3b^3c^3d + 822a^4b^2c^2d^2 - 278a^5b*c^3d + \\
& 47a^6d^4 + 60(10b^6c^2d^2 - 5a*b^5c^3d + a^2b^4d^4)x^4 - 30(10b^6c^3d - 95a*b^5c^2d^2 + \\
& 46a^2b^4c^3d - 9a^3b^3d^4)x^3 + 10(20b^6c^4 - 140a*b^5c^3d + 537a^2b^4c^2d^2 - \\
& 248a^3b^3c^3d + 47a^4b^2d^4)x^2 + 5(35a*b^5c^4 - 218a^2b^4c^3d + 702a^3b^3c^2d^2 - \\
& 278a^4b^2c^3d + 47a^5b^1d^4)x)/((b^{12}c^4 - 4a*b^{11}c^3d + 6a^2b^{10}c^2d^2 - 4a^3b^9c^3d + \\
& a^4b^8d^4)*g^6x^5 + 5(a*b^{11}c^4 - 4a^2b^{10}c^3d + 6a^3b^9c^2d^2 - 4a^4b^8c^3d + \\
& a^5b^7d^4)*g^6x^4 + 10(a^2b^{10}c^4 - 4a^3b^9c^3d + 6a^4b^8c^2d^2 - 4a^5b^7c^3d + \\
& a^6b^6d^4)*g^6x^3 + 10(a^3b^9c^4 - 4a^4b^8c^3d + 6a^5b^7c^2d^2 - 4a^6b^6c^3d + \\
& a^7b^5d^4)*g^6x^2 + 5(a^4b^8c^4 - 4a^5b^7c^3d + 6a^6b^6c^2d^2 - 4a^7b^5c^3d + \\
& a^8b^4d^4)*g^6x + (a^5b^7c^4 - 4a^6b^6c^3d + 6a^7b^5c^2d^2 - 4a^8b^4c^3d + \\
& a^9b^3d^4)*g^6) + 60(10b^2c^2d^3 - 5a*b*c^3d^4 + a^2d^5)*\log(b*x + a)/((b^8c^5 - \\
& 5a*b^7c^4d + 10a^2b^6c^3d^2 - 10a^3b^5c^2d^3 + 5a^4b^4c^1d^4 - a^5b^3d^5)*g^6) - \\
& 60(10b^2c^2d^3 - 5a*b*c^3d^4 + a^2d^5)*\log(d*x + c)/((b^8c^5 - 5a*b^7c^4d + \\
& 10a^2b^6c^3d^2 - 10a^3b^5c^2d^3 + 5a^4b^4c^1d^4 - a^5b^3d^5)*g^6)) - 1/200A*B*c^2d^2i^3(60(5b*x + a)*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) \\
& )/(b^7g^6x^5 + 5a*b^6g^6x^4 + 10a^2b^5g^6x^3 + 10a^3b^4g^6x^2 + 5a^4b^3g^6x + \\
& a^5b^2g^6) + (27a*b^4c^4 - 148a^2b^3c^3d + 352a^3b^2c^2d^2 - 548a^4b*c^3d + 77a^5d^4 - \\
& 60(5b^5c^3d - a*b^4d^4)x^4 + 30(5b^5c^2d^2 - 46a*b^4c^3d + 9a^2b^3d^4)x^3 - 10(10 \\
& *b^5c^3d - 67a*b^4c^2d^2 + 248a^2b^3c^3d - 47a^3b^2d^4)x^2 + 5(15b^5c^4 - 88a*b^4c^3d + \\
& 232a^2b^3c^2d^2 - 428a^3b^2c^3d + 77a^4b^1d^4)x)/((b^{11}c^4 - 4a*b^{10}c^3d + 6a^2b^9c^2d^2 - 4a^3b^8
\end{aligned}$$

```

*c*d^3 + a^4*b^7*d^4)*g^6*x^5 + 5*(a*b^10*c^4 - 4*a^2*b^9*c^3*d + 6*a^3*b^8
*c^2*d^2 - 4*a^4*b^7*c*d^3 + a^5*b^6*d^4)*g^6*x^4 + 10*(a^2*b^9*c^4 - 4*a^3
*b^8*c^3*d + 6*a^4*b^7*c^2*d^2 - 4*a^5*b^6*c*d^3 + a^6*b^5*d^4)*g^6*x^3 + 1
0*(a^3*b^8*c^4 - 4*a^4*b^7*c^3*d + 6*a^5*b^6*c^2*d^2 - 4*a^6*b^5*c*d^3 + a^
7*b^4*d^4)*g^6*x^2 + 5*(a^4*b^7*c^4 - 4*a^5*b^6*c^3*d + 6*a^6*b^5*c^2*d^2 -
4*a^7*b^4*c*d^3 + a^8*b^3*d^4)*g^6*x + (a^5*b^6*c^4 - 4*a^6*b^5*c^3*d + 6*
a^7*b^4*c^2*d^2 - 4*a^8*b^3*c*d^3 + a^9*b^2*d^4)*g^6) - 60*(5*b*c*d^4 - a*d
^5)*log(b*x + a)/((b^7*c^5 - 5*a*b^6*c^4*d + 10*a^2*b^5*c^3*d^2 - 10*a^3*b^
4*c^2*d^3 + 5*a^4*b^3*c*d^4 - a^5*b^2*d^5)*g^6) + 60*(5*b*c*d^4 - a*d^5)*lo
g(d*x + c)/((b^7*c^5 - 5*a*b^6*c^4*d + 10*a^2*b^5*c^3*d^2 - 10*a^3*b^4*c^2*
d^3 + 5*a^4*b^3*c*d^4 - a^5*b^2*d^5)*g^6)) - 1/150*A*B*c^3*i^3*((60*b^4*d^4
*x^4 + 12*b^4*c^4 - 63*a*b^3*c^3*d + 137*a^2*b^2*c^2*d^2 - 163*a^3*b*c*d^3
+ 137*a^4*d^4 - 30*(b^4*c*d^3 - 9*a*b^3*d^4)*x^3 + 10*(2*b^4*c^2*d^2 - 13*a
*b^3*c*d^3 + 47*a^2*b^2*d^4)*x^2 - 5*(3*b^4*c^3*d - 17*a*b^3*c^2*d^2 + 43*a
^2*b^2*c*d^3 - 77*a^3*b*d^4)*x)/((b^10*c^4 - 4*a*b^9*c^3*d + 6*a^2*b^8*c^2*
d^2 - 4*a^3*b^7*c*d^3 + a^4*b^6*d^4)*g^6*x^5 + 5*(a*b^9*c^4 - 4*a^2*b^8*c^3
*d + 6*a^3*b^7*c^2*d^2 - 4*a^4*b^6*c*d^3 + a^5*b^5*d^4)*g^6*x^4 + 10*(a^2*b
^8*c^4 - 4*a^3*b^7*c^3*d + 6*a^4*b^6*c^2*d^2 - 4*a^5*b^5*c*d^3 + a^6*b^4*d^
4)*g^6*x^3 + 10*(a^3*b^7*c^4 - 4*a^4*b^6*c^3*d + 6*a^5*b^5*c^2*d^2 - 4*a^6*
b^4*c*d^3 + a^7*b^3*d^4)*g^6*x^2 + 5*(a^4*b^6*c^4 - 4*a^5*b^5*c^3*d + 6*a^6
*b^4*c^2*d^2 - 4*a^7*b^3*c*d^3 + a^8*b^2*d^4)*g^6*x + (a^5*b^5*c^4 - 4*a^6*
b^4*c^3*d + 6*a^7*b^3*c^2*d^2 - 4*a^8*b^2*c*d^3 + a^9*b*d^4)*g^6) + 60*log(
b*e*x/(d*x + c) + a*e/(d*x + c))/(b^6*g^6*x^5 + 5*a*b^5*g^6*x^4 + 10*a^2*b^
4*g^6*x^3 + 10*a^3*b^3*g^6*x^2 + 5*a^4*b^2*g^6*x + a^5*b*g^6) + 60*d^5*log(
b*x + a)/((b^6*c^5 - 5*a*b^5*c^4*d + 10*a^2*b^4*c^3*d^2 - 10*a^3*b^3*c^2*d^
3 + 5*a^4*b^2*c*d^4 - a^5*b*d^5)*g^6) - 60*d^5*log(d*x + c)/((b^6*c^5 - 5*a
*b^5*c^4*d + 10*a^2*b^4*c^3*d^2 - 10*a^3*b^3*c^2*d^3 + 5*a^4*b^2*c*d^4 - a^
5*b*d^5)*g^6)) - 1/5*B^2*c^3*i^3*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^
6*g^6*x^5 + 5*a*b^5*g^6*x^4 + 10*a^2*b^4*g^6*x^3 + 10*a^3*b^3*g^6*x^2 + 5*a
^4*b^2*g^6*x + a^5*b*g^6) - 3/20*(5*b*x + a)*A^2*c^2*d*i^3/(b^7*g^6*x^5 + 5
*a*b^6*g^6*x^4 + 10*a^2*b^5*g^6*x^3 + 10*a^3*b^4*g^6*x^2 + 5*a^4*b^3*g^6*x
+ a^5*b^2*g^6) - 1/10*(10*b^2*x^2 + 5*a*b*x + a^2)*A^2*c*d^2*i^3/(b^8*g^6*x
^5 + 5*a*b^7*g^6*x^4 + 10*a^2*b^6*g^6*x^3 + 10*a^3*b^5*g^6*x^2 + 5*a^4*b^4*
g^6*x + a^5*b^3*g^6) - 1/20*(10*b^3*x^3 + 10*a*b^2*x^2 + 5*a^2*b*x + a^3)*A
^2*d^3*i^3/(b^9*g^6*x^5 + 5*a*b^8*g^6*x^4 + 10*a^2*b^7*g^6*x^3 + 10*a^3*b^6
*g^6*x^2 + 5*a^4*b^5*g^6*x + a^5*b^4*g^6) - 1/5*A^2*c^3*i^3/(b^6*g^6*x^5 +
5*a*b^5*g^6*x^4 + 10*a^2*b^4*g^6*x^3 + 10*a^3*b^3*g^6*x^2 + 5*a^4*b^2*g^6*x
+ a^5*b*g^6)

```

---

**Fricas [B]** time = 0.623722, size = 2209, normalized size = 7.39

result too large to display



Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^6,x, algorithm="fricas")
```

```
[Out] 1/4000*(20*((20*A*B + 9*B^2)*b^5*c*d^4 - (20*A*B + 9*B^2)*a*b^4*d^5)*i^3*x^4 - 10*((200*A^2 + 20*A*B - 11*B^2)*b^5*c^2*d^3 - 50*(8*A^2 + 4*A*B + B^2)*a*b^4*c*d^4 + (200*A^2 + 180*A*B + 61*B^2)*a^2*b^3*d^5)*i^3*x^3 - 10*(2*(200*A^2 + 60*A*B + 7*B^2)*b^5*c^3*d^2 - 75*(8*A^2 + 4*A*B + B^2)*a*b^4*c^2*d^3 + (200*A^2 + 180*A*B + 61*B^2)*a^3*b^2*d^5)*i^3*x^2 - 5*((600*A^2 + 220*A*B + 39*B^2)*b^5*c^4*d - 100*(8*A^2 + 4*A*B + B^2)*a*b^4*c^3*d^2 + (200*A^2 + 180*A*B + 61*B^2)*a^4*b*d^5)*i^3*x - (32*(25*A^2 + 10*A*B + 2*B^2)*b^5*c^5 - 125*(8*A^2 + 4*A*B + B^2)*a*b^4*c^4*d + (200*A^2 + 180*A*B + 61*B^2)*a^5*d^5)*i^3 + 200*(B^2*b^5*d^5*i^3*x^5 + 5*B^2*a*b^4*d^5*i^3*x^4 - 10*(B^2*b^5*c^2*d^3 - 2*B^2*a*b^4*c*d^4)*i^3*x^3 - 10*(2*B^2*b^5*c^3*d^2 - 3*B^2*a*b^4*c^2*d^3)*i^3*x^2 - 5*(3*B^2*b^5*c^4*d - 4*B^2*a*b^4*c^3*d^2)*i^3*x - (4*B^2*b^5*c^5 - 5*B^2*a*b^4*c^4*d)*i^3)*log((b*e*x + a*e)/(d*x + c))^2 + 20*((20*A*B + 9*B^2)*b^5*d^5*i^3*x^5 + 5*(4*B^2*b^5*c*d^4 + 5*(4*A*B + B^2)*a*b^4*d^5)*i^3*x^4 - 10*((20*A*B + B^2)*b^5*c^2*d^3 - 10*(4*A*B + B^2)*a*b^4*c*d^4)*i^3*x^3 - 10*(2*(20*A*B + 3*B^2)*b^5*c^3*d^2 - 15*(4*A*B + B^2)*a*b^4*c^2*d^3)*i^3*x^2 - 5*((60*A*B + 11*B^2)*b^5*c^4*d - 20*(4*A*B + B^2)*a*b^4*c^3*d^2)*i^3*x - (16*(5*A*B + B^2)*b^5*c^5 - 25*(4*A*B + B^2)*a*b^4*c^4*d)*i^3)*log((b*e*x + a*e)/(d*x + c))/((b^11*c^2 - 2*a*b^10*c*d + a^2*b^9*d^2)*g^6*x^5 + 5*(a*b^10*c^2 - 2*a^2*b^9*c*d + a^3*b^8*d^2)*g^6*x^4 + 10*(a^2*b^9*c^2 - 2*a^3*b^8*c*d + a^4*b^7*d^2)*g^6*x^3 + 10*(a^3*b^8*c^2 - 2*a^4*b^7*c*d + a^5*b^6*d^2)*g^6*x^2 + 5*(a^4*b^7*c^2 - 2*a^5*b^6*c*d + a^6*b^5*d^2)*g^6*x + (a^5*b^6*c^2 - 2*a^6*b^5*c*d + a^7*b^4*d^2)*g^6)
```

---

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**6,x)
```

```
[Out] Timed out
```

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3 \left( B \log \left( \frac{(bx+a)e}{dx+c} \right) + A \right)^2}{(bgx + ag)^6} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^6,x, algorithm="giac")

[Out] integrate((d\*i\*x + c\*i)^3\*(B\*log((b\*x + a)\*e/(d\*x + c)) + A)^2/(b\*g\*x + a\*g)^6, x)

$$3.83 \quad \int \frac{(ci+dx)^3 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)^2}{(ag+bgx)^7} dx$$

**Optimal.** Leaf size=463

$$\frac{b^2 i^3 (c+dx)^6 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)^2}{6g^7 (a+bx)^6 (bc-ad)^3} - \frac{b^2 B i^3 (c+dx)^6 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{18g^7 (a+bx)^6 (bc-ad)^3} - \frac{d^2 i^3 (c+dx)^4 \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)^2}{4g^7 (a+bx)^4 (bc-ad)^3} - \dots$$

[Out]  $-(B^2 d^2 i^3 (c+dx)^4)/(32(b^2 c - a^2 d)^3 g^7 (a+bx)^4) + (4 b^2 B^2 d^2 i^3 (c+dx)^5)/(125(b^2 c - a^2 d)^3 g^7 (a+bx)^5) - (b^2 B^2 i^3 (c+dx)^6)/(108(b^2 c - a^2 d)^3 g^7 (a+bx)^6) - (B d^2 i^3 (c+dx)^4 (A + B \log[(e(a+bx))/(c+dx)]))/(8(b^2 c - a^2 d)^3 g^7 (a+bx)^4) + (4 b^2 B d^2 i^3 (c+dx)^5 (A + B \log[(e(a+bx))/(c+dx)]))/(25(b^2 c - a^2 d)^3 g^7 (a+bx)^5) - (b^2 B i^3 (c+dx)^6 (A + B \log[(e(a+bx))/(c+dx)]))/(18(b^2 c - a^2 d)^3 g^7 (a+bx)^6) - (d^2 i^3 (c+dx)^4 (A + B \log[(e(a+bx))/(c+dx]])^2)/(4(b^2 c - a^2 d)^3 g^7 (a+bx)^4) + (2 b^2 d^2 i^3 (c+dx)^5 (A + B \log[(e(a+bx))/(c+dx]])^2)/(5(b^2 c - a^2 d)^3 g^7 (a+bx)^5) - (b^2 i^3 (c+dx)^6 (A + B \log[(e(a+bx))/(c+dx]])^2)/(6(b^2 c - a^2 d)^3 g^7 (a+bx)^6)$

**Rubi [C]** time = 6.0774, antiderivative size = 1152, normalized size of antiderivative = 2.49, number of steps used = 162, number of rules used = 11, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.262$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2 i^3 \log^2(a+bx) d^6}{60b^4 (bc-ad)^3 g^7} + \frac{B^2 i^3 \log^2(c+dx) d^6}{60b^4 (bc-ad)^3 g^7} - \frac{37B^2 i^3 \log(a+bx) d^6}{1800b^4 (bc-ad)^3 g^7} - \frac{B i^3 \log(a+bx) \left( A + B \log\left(\frac{e(a+bx)}{c+dx}\right) \right) d^6}{30b^4 (bc-ad)^3 g^7} + \frac{37B^2 i^3}{1800b^4}$$

Antiderivative was successfully verified.

[In] Int[((c\*i + d\*i\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]])^2)/(a\*g + b\*g\*x)^7,x]

[Out]  $-(B^2(b^2 c - a^2 d)^3 i^3)/(108 b^4 g^7 (a+bx)^6) - (53 B^2 d^2 (b^2 c - a^2 d)^2 i^3)/(2250 b^4 g^7 (a+bx)^5) - (73 B^2 d^2 (b^2 c - a^2 d) i^3)/(7200 b^4 g^7 (a+bx)^4) + (53 B^2 d^3 i^3)/(5400 b^4 g^7 (a+bx)^3) - (23 B^2 d^4 i^3)/(3600 b^4 (b^2 c - a^2 d) g^7 (a+bx)^2) - (37 B^2 d^5 i^3)/(1800 b^4 (b^2 c - a^2 d)^2 g^7 (a+bx)) - (37 B^2 d^6 i^3 \log[a+bx])/(1800 b^4 (b^2 c - a^2 d)^3 g^7) + (B^2 d^6 i^3 \log[a+bx]^2)/(60 b^4 (b^2 c - a^2 d)^3 g^7) - (B(b^2 c - a^2 d)^3 i^3 (A + B \log[(e(a+bx))/(c+dx)]))/(18 b^4 g^7 (a+bx)^6)$

$$\begin{aligned} & b*x)^6) - (13*B*d*(b*c - a*d)^2*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x])))/ \\ & (75*b^4*g^7*(a + b*x)^5) - (19*B*d^2*(b*c - a*d)*i^3*(A + B*Log[(e*(a + b*x) \\ & ))/(c + d*x])))/(120*b^4*g^7*(a + b*x)^4) - (B*d^3*i^3*(A + B*Log[(e*(a + b \\ & *x))/(c + d*x])))/(90*b^4*g^7*(a + b*x)^3) + (B*d^4*i^3*(A + B*Log[(e*(a + \\ & b*x))/(c + d*x])))/(60*b^4*(b*c - a*d)*g^7*(a + b*x)^2) - (B*d^5*i^3*(A + B \\ & *Log[(e*(a + b*x))/(c + d*x])))/(30*b^4*(b*c - a*d)^2*g^7*(a + b*x)) - (B*d \\ & ^6*i^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x])))/(30*b^4*(b*c - a* \\ & d)^3*g^7) - ((b*c - a*d)^3*i^3*(A + B*Log[(e*(a + b*x))/(c + d*x]))^2)/(6*b \\ & ^4*g^7*(a + b*x)^6) - (3*d*(b*c - a*d)^2*i^3*(A + B*Log[(e*(a + b*x))/(c + \\ & d*x]))^2)/(5*b^4*g^7*(a + b*x)^5) - (3*d^2*(b*c - a*d)*i^3*(A + B*Log[(e*(a \\ & + b*x))/(c + d*x]))^2)/(4*b^4*g^7*(a + b*x)^4) - (d^3*i^3*(A + B*Log[(e*(a \\ & + b*x))/(c + d*x]))^2)/(3*b^4*g^7*(a + b*x)^3) + (37*B^2*d^6*i^3*Log[c + d \\ & *x])/(1800*b^4*(b*c - a*d)^3*g^7) - (B^2*d^6*i^3*Log[-((d*(a + b*x))/(b*c - \\ & a*d))]*Log[c + d*x])/(30*b^4*(b*c - a*d)^3*g^7) + (B*d^6*i^3*(A + B*Log[(e \\ & *(a + b*x))/(c + d*x]))*Log[c + d*x])/(30*b^4*(b*c - a*d)^3*g^7) + (B^2*d^6 \\ & *i^3*Log[c + d*x]^2)/(60*b^4*(b*c - a*d)^3*g^7) - (B^2*d^6*i^3*Log[a + b*x] \\ & *Log[(b*(c + d*x))/(b*c - a*d)])/(30*b^4*(b*c - a*d)^3*g^7) - (B^2*d^6*i^3* \\ & PolyLog[2, -((d*(a + b*x))/(b*c - a*d))]/(30*b^4*(b*c - a*d)^3*g^7) - (B^2 \\ & *d^6*i^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]/(30*b^4*(b*c - a*d)^3*g^7) \end{aligned}$$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
```

& NeQ[b\*c - a\*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])

#### Rule 2524

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] :> Simp[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^n)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

#### Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*(RFx\_), x\_Symbol] :> With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]

#### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.)\*(x\_))^(q\_.), x\_Symbol] :> Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

#### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] :> Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

#### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :> Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n]))/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

#### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :> Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

#### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}
\int \frac{(83c + 83dx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(ag + bgx)^7} dx &= \int \left( \frac{571787(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{b^3 g^7 (a + bx)^7} + \frac{1715361d(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{b^3 g^7 (a + bx)^6} \right) dx \\
&= \frac{(571787d^3) \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(a+bx)^4} dx}{b^3 g^7} + \frac{(1715361d^2(bc - ad)) \int \frac{A + B \log \left( \frac{e(a+bx)}{c+dx} \right)}{(a+bx)^5} dx}{b^3 g^7} \\
&= -\frac{571787(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{6b^4 g^7 (a + bx)^6} - \frac{1715361d(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{5b^4 g^7 (a + bx)^5} \\
&= -\frac{571787(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{6b^4 g^7 (a + bx)^6} - \frac{1715361d(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{5b^4 g^7 (a + bx)^5} \\
&= -\frac{571787(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{6b^4 g^7 (a + bx)^6} - \frac{1715361d(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{5b^4 g^7 (a + bx)^5} \\
&= -\frac{571787(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{6b^4 g^7 (a + bx)^6} - \frac{1715361d(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{5b^4 g^7 (a + bx)^5} \\
&= -\frac{571787B(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{18b^4 g^7 (a + bx)^6} - \frac{7433231Bd(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{75b^4 g^7 (a + bx)^5} \\
&= -\frac{571787B(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{18b^4 g^7 (a + bx)^6} - \frac{7433231Bd(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{75b^4 g^7 (a + bx)^5} \\
&= -\frac{571787B(bc - ad)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{18b^4 g^7 (a + bx)^6} - \frac{7433231Bd(bc - ad)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{75b^4 g^7 (a + bx)^5} \\
&= -\frac{571787B^2(bc - ad)^3}{108b^4 g^7 (a + bx)^6} - \frac{30304711B^2d(bc - ad)^2}{2250b^4 g^7 (a + bx)^5} - \frac{41740451B^2d^2(bc - ad)}{7200b^4 g^7 (a + bx)^4} \\
&= -\frac{571787B^2(bc - ad)^3}{108b^4 g^7 (a + bx)^6} - \frac{30304711B^2d(bc - ad)^2}{2250b^4 g^7 (a + bx)^5} - \frac{41740451B^2d^2(bc - ad)}{7200b^4 g^7 (a + bx)^4} \\
&= -\frac{571787B^2(bc - ad)^3}{108b^4 g^7 (a + bx)^6} - \frac{30304711B^2d(bc - ad)^2}{2250b^4 g^7 (a + bx)^5} - \frac{41740451B^2d^2(bc - ad)}{7200b^4 g^7 (a + bx)^4} \\
&= -\frac{571787B^2(bc - ad)^3}{108b^4 g^7 (a + bx)^6} - \frac{30304711B^2d(bc - ad)^2}{2250b^4 g^7 (a + bx)^5} - \frac{41740451B^2d^2(bc - ad)}{7200b^4 g^7 (a + bx)^4}
\end{aligned}$$

**Mathematica [C]** time = 5.9321, size = 2583, normalized size = 5.58

Result too large to show

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2)/(a\*g + b\*g\*x)^7,x]

[Out] (i^3\*(8100\*a^2\*B^2\*d^2\*(b\*c - a\*d)^4 - 1000\*B^2\*(b\*c - a\*d)^6 + 3744\*a\*B^2\*d\*(-(b\*c) + a\*d)^5 + 16200\*a\*b\*B^2\*d^2\*(b\*c - a\*d)^4\*x - 3744\*b\*B^2\*d\*(b\*c - a\*d)^5\*x + 8100\*b^2\*B^2\*d^2\*(b\*c - a\*d)^4\*x^2 + 4680\*a\*B^2\*d^2\*(b\*c - a\*d)^4\*(a + b\*x) + 1200\*B^2\*d\*(b\*c - a\*d)^5\*(a + b\*x) + 10800\*a^2\*B^2\*d^3\*(-(b\*c) + a\*d)^3\*(a + b\*x) + 4680\*b\*B^2\*d^2\*(b\*c - a\*d)^4\*x\*(a + b\*x) + 21600\*a\*b\*B^2\*d^3\*(-(b\*c) + a\*d)^3\*x\*(a + b\*x) - 10800\*b^2\*B^2\*d^3\*(b\*c - a\*d)^3\*x^2\*(a + b\*x) + 16200\*a^2\*B^2\*d^4\*(b\*c - a\*d)^2\*(a + b\*x)^2 - 13875\*B^2\*d^2\*(b\*c - a\*d)^4\*(a + b\*x)^2 + 20640\*a\*B^2\*d^3\*(-(b\*c) + a\*d)^3\*(a + b\*x)^2 + 32400\*a\*b\*B^2\*d^4\*(b\*c - a\*d)^2\*x\*(a + b\*x)^2 - 20640\*b\*B^2\*d^3\*(b\*c - a\*d)^3\*x\*(a + b\*x)^2 + 16200\*b^2\*B^2\*d^4\*(b\*c - a\*d)^2\*x^2\*(a + b\*x)^2 + 63360\*a\*B^2\*d^4\*(b\*c - a\*d)^2\*(a + b\*x)^3 + 32500\*B^2\*d^3\*(b\*c - a\*d)^3\*(a + b\*x)^3 + 32400\*a^2\*B^2\*d^5\*(-(b\*c) + a\*d)\*(a + b\*x)^3 + 63360\*b\*B^2\*d^4\*(b\*c - a\*d)^2\*x\*(a + b\*x)^3 + 64800\*a\*b\*B^2\*d^5\*(-(b\*c) + a\*d)\*x\*(a + b\*x)^3 - 32400\*b^2\*B^2\*d^5\*(b\*c - a\*d)\*x^2\*(a + b\*x)^3 - 129600\*a\*b\*B^2\*c\*d^5\*(a + b\*x)^4 + 129600\*a^2\*B^2\*d^6\*(a + b\*x)^4 - 80250\*B^2\*d^4\*(b\*c - a\*d)^2\*(a + b\*x)^4 + 126720\*a\*B^2\*d^5\*(-(b\*c) + a\*d)\*(a + b\*x)^4 - 129600\*b^2\*B^2\*c\*d^5\*x\*(a + b\*x)^4 + 129600\*a\*b\*B^2\*d^6\*x\*(a + b\*x)^4 - 126720\*b\*B^2\*d^5\*(b\*c - a\*d)\*x\*(a + b\*x)^4 + 126000\*b\*B^2\*c\*d^5\*(a + b\*x)^5 - 126000\*a\*B^2\*d^6\*(a + b\*x)^5 + 160500\*B^2\*d^5\*(b\*c - a\*d)\*(a + b\*x)^5 - 32400\*a^2\*B^2\*d^6\*(a + b\*x)^4\*Log[a + b\*x] - 64800\*a\*b\*B^2\*d^6\*x\*(a + b\*x)^4\*Log[a + b\*x] - 32400\*b^2\*B^2\*d^6\*x^2\*(a + b\*x)^4\*Log[a + b\*x] - 256320\*a\*B^2\*d^6\*(a + b\*x)^5\*Log[a + b\*x] - 256320\*b\*B^2\*d^6\*x\*(a + b\*x)^5\*Log[a + b\*x] + 286500\*B^2\*d^6\*(a + b\*x)^6\*Log[a + b\*x] - 6000\*B\*(b\*c - a\*d)^6\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) + 25920\*a\*B\*d\*(-(b\*c) + a\*d)^5\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) - 25920\*b\*B\*d\*(b\*c - a\*d)^5\*x\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) + 32400\*a\*B\*d^2\*(b\*c - a\*d)^4\*(a + b\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) + 7200\*B\*d\*(b\*c - a\*d)^5\*(a + b\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) + 32400\*b\*B\*d^2\*(b\*c - a\*d)^4\*x\*(a + b\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) - 49500\*B\*d^2\*(b\*c - a\*d)^4\*(a + b\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) + 43200\*a\*B\*d^3\*(-(b\*c) + a\*d)^3\*(a + b\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) - 43200\*b\*B\*d^3\*(b\*c - a\*d)^3\*x\*(a + b\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) + 64800\*a\*B\*d^4\*(b\*c - a\*d)^2\*(a + b\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) + 42000\*B\*d^3\*(b\*c - a\*d)^3\*(a + b\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) + 64800\*b\*B\*d^4\*(b\*c - a\*d)^2\*x\*(a + b\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]) - 63000\*B\*d^4\*(b\*c - a\*d)^2\*(a + b\*x)^4\*(A + B\*Log[(e\*(a



$$\begin{aligned}
& + b*x))/(c + d*x))] + 129600*a*B*d^5*(-(b*c) + a*d)*(a + b*x)^4*(A + B*\text{Log} \\
& [(e*(a + b*x))/(c + d*x))] - 129600*b*B*d^5*(b*c - a*d)*x*(a + b*x)^4*(A + \\
& B*\text{Log}[(e*(a + b*x))/(c + d*x))] + 126000*B*d^5*(b*c - a*d)*(a + b*x)^5*(A + \\
& B*\text{Log}[(e*(a + b*x))/(c + d*x))] - 129600*a*B*d^6*(a + b*x)^5*\text{Log}[a + b*x]* \\
& (A + B*\text{Log}[(e*(a + b*x))/(c + d*x))] - 129600*b*B*d^6*x*(a + b*x)^5*\text{Log}[a + \\
& b*x]*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x))] + 126000*B*d^6*(a + b*x)^6*\text{Log}[a \\
& + b*x]*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x))] - 18000*(b*c - a*d)^6*(A + B*\text{L} \\
& \text{og}[(e*(a + b*x))/(c + d*x))]^2 + 64800*d*(-(b*c) + a*d)^5*(a + b*x)*(A + B* \\
& \text{Log}[(e*(a + b*x))/(c + d*x))]^2 - 81000*d^2*(b*c - a*d)^4*(a + b*x)^2*(A + \\
& B*\text{Log}[(e*(a + b*x))/(c + d*x))]^2 + 36000*d^3*(-(b*c) + a*d)^3*(a + b*x)^3* \\
& (A + B*\text{Log}[(e*(a + b*x))/(c + d*x))]^2 + 32400*a^2*B^2*d^6*(a + b*x)^4*\text{Log}[ \\
& c + d*x] + 64800*a*b*B^2*d^6*x*(a + b*x)^4*\text{Log}[c + d*x] + 32400*b^2*B^2*d^6 \\
& *x^2*(a + b*x)^4*\text{Log}[c + d*x] + 256320*a*B^2*d^6*(a + b*x)^5*\text{Log}[c + d*x] + \\
& 256320*b*B^2*d^6*x*(a + b*x)^5*\text{Log}[c + d*x] - 286500*B^2*d^6*(a + b*x)^6*L \\
& \text{og}[c + d*x] + 129600*a*B*d^6*(a + b*x)^5*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x) \\
& ])*\text{Log}[c + d*x] + 129600*b*B*d^6*x*(a + b*x)^5*(A + B*\text{Log}[(e*(a + b*x))/(c \\
& + d*x)])*\text{Log}[c + d*x] - 126000*B*d^6*(a + b*x)^6*(A + B*\text{Log}[(e*(a + b*x))/( \\
& c + d*x)])*\text{Log}[c + d*x] + 64800*a*B^2*d^6*(a + b*x)^5*(\text{Log}[a + b*x]*(\text{Log}[a \\
& + b*x] - 2*\text{Log}[(b*(c + d*x))/(b*c - a*d)])) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-( \\
& b*c) + a*d)] + 64800*b*B^2*d^6*x*(a + b*x)^5*(\text{Log}[a + b*x]*(\text{Log}[a + b*x] - \\
& 2*\text{Log}[(b*(c + d*x))/(b*c - a*d)])) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-(b*c) + a \\
& *d)] - 63000*B^2*d^6*(a + b*x)^6*(\text{Log}[a + b*x]*(\text{Log}[a + b*x] - 2*\text{Log}[(b*(c \\
& + d*x))/(b*c - a*d)])) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-(b*c) + a*d)] - 6480 \\
& 0*a*B^2*d^6*(a + b*x)^5*((2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] - \text{Log}[c + d*x \\
& ])*\text{Log}[c + d*x] + 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)] - 64800*b*B^2*d^ \\
& 6*x*(a + b*x)^5*((2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] - \text{Log}[c + d*x])* \\
& \text{Log}[c + d*x] + 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])) + 63000*B^2*d^6*(a + b*x \\
& )^6*((2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] - \text{Log}[c + d*x])* \\
& \text{Log}[c + d*x] + 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])))/(108000*b^4*(b*c - a*d)^3*g^7*(a + \\
& b*x)^6)
\end{aligned}$$


---

**Maple [B]** time = 0.053, size = 2762, normalized size = 6.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In]  $\text{int}((d*i*x+c*i)^3*(A+B*\ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^7,x)$

[Out]  $\frac{1}{18}e^{6d}i^3/(a*d-b*c)^4/g^7A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^6*a-1/3e^{6d}i^3/(a*d-b*c)^4/g^7A*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^6*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-1/4e^{4d}i^3/(a*d-b*c)^4/g^7B^2/(b$

$$\begin{aligned}
& *e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b*c+1 \\
& /18*e^6*d*i^3/(a*d-b*c)^4/g^7*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^6 \\
& *\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-1/8*e^4*d^2*i^3/(a*d-b*c)^4/g^7*B^2/(b*e \\
& /d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+1/2*e \\
& ^4*d^3*i^3/(a*d-b*c)^4/g^7*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*\ln(b*e \\
& /d+(a*d-b*c)*e/d/(d*x+c))*a-2/5*e^5*d^2*i^3/(a*d-b*c)^4/g^7*B^2*b/(b*e/d+e/ \\
& (d*x+c)*a-e/d/(d*x+c)*b*c)^5*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+2/5*e^5*d* \\
& i^3/(a*d-b*c)^4/g^7*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*\ln(b*e/d+ \\
& (a*d-b*c)*e/d/(d*x+c))^2*c+4/25*e^5*d*i^3/(a*d-b*c)^4/g^7*B^2*b^2/(b*e/d+e/ \\
& (d*x+c)*a-e/d/(d*x+c)*b*c)^5*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+1/6*e^6*d*i^ \\
& 3/(a*d-b*c)^4/g^7*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^6*\ln(b*e/d+(a \\
& *d-b*c)*e/d/(d*x+c))^2*a-1/8*e^4*d^2*i^3/(a*d-b*c)^4/g^7*A*B/(b*e/d+e/(d*x+ \\
& c)*a-e/d/(d*x+c)*b*c)^4*b*c-4/25*e^5*d^2*i^3/(a*d-b*c)^4/g^7*A*B*b/(b*e/d+e \\
& /d*x+c)*a-e/d/(d*x+c)*b*c)^5*a+4/25*e^5*d*i^3/(a*d-b*c)^4/g^7*A*B*b^2/(b*e \\
& /d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*c-4/25*e^5*d^2*i^3/(a*d-b*c)^4/g^7*B^2*b/ \\
& (b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-4/1 \\
& 25*e^5*d^2*i^3/(a*d-b*c)^4/g^7*B^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5* \\
& a+4/125*e^5*d*i^3/(a*d-b*c)^4/g^7*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b* \\
& c)^5*c+1/108*e^6*d*i^3/(a*d-b*c)^4/g^7*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+ \\
& c)*b*c)^6*a-1/18*e^6*i^3/(a*d-b*c)^4/g^7*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d* \\
& x+c)*b*c)^6*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+1/4*e^4*d^3*i^3/(a*d-b*c)^4/g \\
& ^7*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c) \\
& )^2*a+1/8*e^4*d^3*i^3/(a*d-b*c)^4/g^7*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b* \\
& c)^4*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-1/6*e^6*i^3/(a*d-b*c)^4/g^7*B^2*b^3/ \\
& (b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^6*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c+1 \\
& /4*e^4*d^3*i^3/(a*d-b*c)^4/g^7*A^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a+ \\
& 1/6*e^6*d*i^3/(a*d-b*c)^4/g^7*A^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^6 \\
& *a+1/8*e^4*d^3*i^3/(a*d-b*c)^4/g^7*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^ \\
& 4*a-1/32*e^4*d^2*i^3/(a*d-b*c)^4/g^7*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c \\
& )^4*b*c+1/32*e^4*d^3*i^3/(a*d-b*c)^4/g^7*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c) \\
& *b*c)^4*a-1/6*e^6*i^3/(a*d-b*c)^4/g^7*A^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c) \\
& )*b*c)^6*c-1/108*e^6*i^3/(a*d-b*c)^4/g^7*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d* \\
& x+c)*b*c)^6*c+1/3*e^6*d*i^3/(a*d-b*c)^4/g^7*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/ \\
& (d*x+c)*b*c)^6*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-1/2*e^4*d^2*i^3/(a*d-b*c)^ \\
& 4/g^7*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*\ln(b*e/d+(a*d-b*c)*e/d/(d*x \\
& +c))*b*c-4/5*e^5*d^2*i^3/(a*d-b*c)^4/g^7*A*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+ \\
& c)*b*c)^5*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+4/5*e^5*d*i^3/(a*d-b*c)^4/g^7*A \\
& *B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^5*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c) \\
& )*c-1/18*e^6*i^3/(a*d-b*c)^4/g^7*A*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c \\
& )^6*c-1/4*e^4*d^2*i^3/(a*d-b*c)^4/g^7*A^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b* \\
& c)^4*b*c-2/5*e^5*d^2*i^3/(a*d-b*c)^4/g^7*A^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+ \\
& c)*b*c)^5*a+2/5*e^5*d*i^3/(a*d-b*c)^4/g^7*A^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/( \\
& *x+c)*b*c)^5*c
\end{aligned}$$

---

**Maxima [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^7,x, algorithm="maxima")

[Out] Timed out

---

**Fricas [B]** time = 0.703528, size = 3443, normalized size = 7.44

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^7,x, algorithm="fricas")

[Out] 
$$\begin{aligned} & -1/108000*(60*((60*A*B + 37*B^2)*b^6*c*d^5 - (60*A*B + 37*B^2)*a*b^5*d^6)*i \\ & ^3*x^5 - 30*((60*A*B - 23*B^2)*b^6*c^2*d^4 - 36*(20*A*B + 9*B^2)*a*b^5*c*d^ \\ & 5 + (660*A*B + 347*B^2)*a^2*b^4*d^6)*i^3*x^4 + 20*((1800*A^2 + 60*A*B - 53* \\ & B^2)*b^6*c^3*d^3 - 27*(200*A^2 + 20*A*B - 11*B^2)*a*b^5*c^2*d^4 + 675*(8*A^ \\ & 2 + 4*A*B + B^2)*a^2*b^4*c*d^5 - (1800*A^2 + 2220*A*B + 919*B^2)*a^3*b^3*d^ \\ & 6)*i^3*x^3 + 15*((5400*A^2 + 1140*A*B + 73*B^2)*b^6*c^4*d^2 - 72*(200*A^2 + \\ & 60*A*B + 7*B^2)*a*b^5*c^3*d^3 + 1350*(8*A^2 + 4*A*B + B^2)*a^2*b^4*c^2*d^4 \\ & - (1800*A^2 + 2220*A*B + 919*B^2)*a^4*b^2*d^6)*i^3*x^2 + 6*(8*(1350*A^2 + \\ & 390*A*B + 53*B^2)*b^6*c^5*d - 45*(600*A^2 + 220*A*B + 39*B^2)*a*b^5*c^4*d^2 \\ & + 2250*(8*A^2 + 4*A*B + B^2)*a^2*b^4*c^3*d^3 - (1800*A^2 + 2220*A*B + 919* \\ & B^2)*a^5*b*d^6)*i^3*x + (1000*(18*A^2 + 6*A*B + B^2)*b^6*c^6 - 1728*(25*A^2 \\ & + 10*A*B + 2*B^2)*a*b^5*c^5*d + 3375*(8*A^2 + 4*A*B + B^2)*a^2*b^4*c^4*d^2 \\ & - (1800*A^2 + 2220*A*B + 919*B^2)*a^6*d^6)*i^3 + 1800*(B^2*b^6*d^6*i^3*x^6 \\ & + 6*B^2*a*b^5*d^6*i^3*x^5 + 15*B^2*a^2*b^4*d^6*i^3*x^4 + 20*(B^2*b^6*c^3*d \\ & ^3 - 3*B^2*a*b^5*c^2*d^4 + 3*B^2*a^2*b^4*c*d^5)*i^3*x^3 + 15*(3*B^2*b^6*c^4 \\ & *d^2 - 8*B^2*a*b^5*c^3*d^3 + 6*B^2*a^2*b^4*c^2*d^4)*i^3*x^2 + 6*(6*B^2*b^6* \\ & c^5*d - 15*B^2*a*b^5*c^4*d^2 + 10*B^2*a^2*b^4*c^3*d^3)*i^3*x + (10*B^2*b^6* \\ & c^6 - 24*B^2*a*b^5*c^5*d + 15*B^2*a^2*b^4*c^4*d^2)*i^3)*log((b*e*x + a*e)/( \\ & d*x + c))^2 + 60*((60*A*B + 37*B^2)*b^6*d^6*i^3*x^6 + 6*(10*B^2*b^6*c*d^5 + \\ & 3*(20*A*B + 9*B^2)*a*b^5*d^6)*i^3*x^5 - 15*(2*B^2*b^6*c^2*d^4 - 24*B^2*a*b \end{aligned}$$

$$\begin{aligned}
& ^5c*d^5 - 15*(4*A*B + B^2)*a^2*b^4*d^6)*i^3*x^4 + 20*((60*A*B + B^2)*b^6*c \\
& ^3*d^3 - 9*(20*A*B + B^2)*a*b^5*c^2*d^4 + 45*(4*A*B + B^2)*a^2*b^4*c*d^5)*i \\
& ^3*x^3 + 15*((180*A*B + 19*B^2)*b^6*c^4*d^2 - 24*(20*A*B + 3*B^2)*a*b^5*c^3 \\
& *d^3 + 90*(4*A*B + B^2)*a^2*b^4*c^2*d^4)*i^3*x^2 + 6*(4*(90*A*B + 13*B^2)*b \\
& ^6*c^5*d - 15*(60*A*B + 11*B^2)*a*b^5*c^4*d^2 + 150*(4*A*B + B^2)*a^2*b^4*c \\
& ^3*d^3)*i^3*x + (100*(6*A*B + B^2)*b^6*c^6 - 288*(5*A*B + B^2)*a*b^5*c^5*d \\
& + 225*(4*A*B + B^2)*a^2*b^4*c^4*d^2)*i^3)*\log((b*e*x + a*e)/(d*x + c))/((b \\
& ^13*c^3 - 3*a*b^12*c^2*d + 3*a^2*b^11*c*d^2 - a^3*b^10*d^3)*g^7*x^6 + 6*(a* \\
& b^12*c^3 - 3*a^2*b^11*c^2*d + 3*a^3*b^10*c*d^2 - a^4*b^9*d^3)*g^7*x^5 + 15* \\
& (a^2*b^11*c^3 - 3*a^3*b^10*c^2*d + 3*a^4*b^9*c*d^2 - a^5*b^8*d^3)*g^7*x^4 + \\
& 20*(a^3*b^10*c^3 - 3*a^4*b^9*c^2*d + 3*a^5*b^8*c*d^2 - a^6*b^7*d^3)*g^7*x^ \\
& 3 + 15*(a^4*b^9*c^3 - 3*a^5*b^8*c^2*d + 3*a^6*b^7*c*d^2 - a^7*b^6*d^3)*g^7* \\
& x^2 + 6*(a^5*b^8*c^3 - 3*a^6*b^7*c^2*d + 3*a^7*b^6*c*d^2 - a^8*b^5*d^3)*g^7 \\
& *x + (a^6*b^7*c^3 - 3*a^7*b^6*c^2*d + 3*a^8*b^5*c*d^2 - a^9*b^4*d^3)*g^7)
\end{aligned}$$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*\*3\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))\*\*2/(b\*g\*x+a\*g)\*\*7,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3 \left( B \log \left( \frac{bx+a}{dx+c} \right) + A \right)^2}{(bgx + ag)^7} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^7,x, algorithm="giac")

[Out] integrate((d\*i\*x + c\*i)^3\*(B\*log((b\*x + a)\*e/(d\*x + c)) + A)^2/(b\*g\*x + a\*g)^7, x)

$$3.84 \quad \int \frac{(ag+bgx)^3 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)^2}{ci+dx} dx$$

**Optimal.** Leaf size=718

$$\frac{2Bg^3(bc-ad)^3 \text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right) \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{d^4i} + \frac{6B^2g^3(bc-ad)^3 \text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)}{d^4i} + \frac{7B^2g^3(bc-ad)^3 \text{Po}}{3d}$$

```
[Out] (b*B^2*(b*c - a*d)^2*g^3*x)/(3*d^3*i) + (B^2*(b*c - a*d)^3*g^3*Log[(a + b*x)/(c + d*x)])/(3*d^4*i) + (7*B*(b*c - a*d)^2*g^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*d^3*i) - (b^2*B*(b*c - a*d)*g^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*d^4*i) + (6*B*(b*c - a*d)^3*g^3*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^4*i) + (3*(b*c - a*d)^2*g^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2)/(d^3*i) - (3*b^2*(b*c - a*d)*g^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2)/(2*d^4*i) + (b^3*g^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2)/(3*d^4*i) + ((b*c - a*d)^3*g^3*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2)/(d^4*i) - (2*B^2*(b*c - a*d)^3*g^3*Log[c + d*x])/(d^4*i) - (7*B*(b*c - a*d)^3*g^3*(A + B*Log[(e*(a + b*x))/(c + d*x]])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(3*d^4*i) + (6*B^2*(b*c - a*d)^3*g^3*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i) + (2*B*(b*c - a*d)^3*g^3*(A + B*Log[(e*(a + b*x))/(c + d*x]])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i) + (7*B^2*(b*c - a*d)^3*g^3*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(3*d^4*i) - (2*B^2*(b*c - a*d)^3*g^3*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i)
```

**Rubi [B]** time = 5.61611, antiderivative size = 1828, normalized size of antiderivative = 2.55, number of steps used = 106, number of rules used = 28, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.667$ , Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 2486, 31, 43, 6688, 6742, 2499, 2396, 2433, 2374, 6589, 2302, 30, 2500, 2375, 2317, 2440, 2434}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2)/(c*i + d*i*x), x]
```

```
[Out] (5*A*b*B*(b*c - a*d)^2*g^3*x)/(3*d^3*i) + (b*B^2*(b*c - a*d)^2*g^3*x)/(3*d^3*i) - (a*B^2*(b*c - a*d)^2*g^3*Log[a + b*x]^2)/(d^3*i) + (B^2*(b*c - a*d)^
```

$$\begin{aligned}
& 3g^3 \text{Log}[a + bx] \text{Log}[(c + dx)^{-1}]^2 / (d^4 i) - (B^2 (bc - ad)^3 g^3 \text{Log}[-((d(a + bx))/(bc - ad))] \text{Log}[(c + dx)^{-1}]^2 / (d^4 i) + (5B^2 (bc - ad)^2 g^3 (a + bx) \text{Log}[(e(a + bx))/(c + dx)]) / (3d^3 i) - (B(bc - ad) g^3 (a + bx)^2 (A + B \text{Log}[(e(a + bx))/(c + dx)])) / (3d^2 i) + (2aB(bc - ad)^2 g^3 \text{Log}[a + bx] (A + B \text{Log}[(e(a + bx))/(c + dx)])) / (d^3 i) + (b(bc - ad)^2 g^3 x (A + B \text{Log}[(e(a + bx))/(c + dx)]^2) / (d^3 i) - ((bc - ad) g^3 (a + bx)^2 (A + B \text{Log}[(e(a + bx))/(c + dx)]^2) / (2d^2 i) + (g^3 (a + bx)^3 (A + B \text{Log}[(e(a + bx))/(c + dx)]^2) / (3d i) - (2B^2 (bc - ad)^3 g^3 \text{Log}[c + dx]) / (d^4 i) + (2bB^2 c (bc - ad)^2 g^3 \text{Log}[-((d(a + bx))/(bc - ad))] \text{Log}[c + dx]) / (d^4 i) + (5B^2 (bc - ad)^3 g^3 \text{Log}[-((d(a + bx))/(bc - ad))] \text{Log}[c + dx]) / (3d^4 i) - (2bB^2 c (bc - ad)^2 g^3 (A + B \text{Log}[(e(a + bx))/(c + dx)]) \text{Log}[c + dx]) / (d^4 i) - (5B(bc - ad)^3 g^3 (A + B \text{Log}[(e(a + bx))/(c + dx)]) \text{Log}[c + dx]) / (3d^4 i) - (bB^2 c (bc - ad)^2 g^3 \text{Log}[c + dx]^2) / (d^4 i) - (5B^2 (bc - ad)^3 g^3 \text{Log}[c + dx]^2) / (6d^4 i) + (2aB^2 (bc - ad)^2 g^3 \text{Log}[a + bx] \text{Log}[(b(c + dx))/(bc - ad)]) / (d^3 i) - (B^2 (bc - ad)^3 g^3 \text{Log}[a + bx]^2 \text{Log}[(b(c + dx))/(bc - ad)]) / (d^4 i) + (B^2 (bc - ad)^3 g^3 \text{Log}[a + bx] \text{Log}[(c + dx)^{-1}] \text{Log}[i(c + dx)]) / (d^4 i) - (AB(bc - ad)^3 g^3 \text{Log}[i(c + dx)]^2) / (d^4 i) + (B^2 (bc - ad)^3 g^3 \text{Log}[a + bx] \text{Log}[i(c + dx)]^2) / (d^4 i) - (B^2 (bc - ad)^3 g^3 \text{Log}[-((d(a + bx))/(bc - ad))] \text{Log}[i(c + dx)]^2) / (d^4 i) - (B^2 (bc - ad)^3 g^3 \text{Log}[i(c + dx)]^3) / (3d^4 i) + (2AB(bc - ad)^3 g^3 \text{Log}[-((d(a + bx))/(bc - ad))] \text{Log}[c i + d i x]) / (d^4 i) - (2B^2 (bc - ad)^3 g^3 \text{Log}[-((d(a + bx))/(bc - ad))] (\text{Log}[a + bx] + \text{Log}[(c + dx)^{-1}] - \text{Log}[(e(a + bx))/(c + dx)]) \text{Log}[c i + d i x]) / (d^4 i) - ((bc - ad)^3 g^3 (A + B \text{Log}[(e(a + bx))/(c + dx)])^2 \text{Log}[c i + d i x]) / (d^4 i) + (B^2 (bc - ad)^3 g^3 \text{Log}[-((d(a + bx))/(bc - ad))] \text{Log}[c i + d i x]^2) / (d^4 i) - (B^2 (bc - ad)^3 g^3 \text{Log}[(e(a + bx))/(c + dx)] \text{Log}[c i + d i x]^2) / (d^4 i) + (2aB^2 (bc - ad)^2 g^3 \text{PolyLog}[2, -((d(a + bx))/(bc - ad))]) / (d^3 i) - (2B^2 (bc - ad)^3 g^3 \text{Log}[a + bx] \text{PolyLog}[2, -((d(a + bx))/(bc - ad))]) / (d^4 i) + (2bB^2 c (bc - ad)^2 g^3 \text{PolyLog}[2, (b(c + dx))/(bc - ad)]) / (d^4 i) + (2AB(bc - ad)^3 g^3 \text{PolyLog}[2, (b(c + dx))/(bc - ad)]) / (d^4 i) + (5B^2 (bc - ad)^3 g^3 \text{PolyLog}[2, (b(c + dx))/(bc - ad)]) / (3d^4 i) + (2B^2 (bc - ad)^3 g^3 \text{Log}[(c + dx)^{-1}] \text{PolyLog}[2, (b(c + dx))/(bc - ad)]) / (d^4 i) - (2B^2 (bc - ad)^3 g^3 (\text{Log}[a + bx] + \text{Log}[(c + dx)^{-1}] - \text{Log}[(e(a + bx))/(c + dx)]) \text{PolyLog}[2, (b(c + dx))/(bc - ad)]) / (d^4 i) + (2B^2 (bc - ad)^3 g^3 \text{PolyLog}[3, -((d(a + bx))/(bc - ad))]) / (d^4 i) + (2B^2 (bc - ad)^3 g^3 \text{PolyLog}[3, (b(c + dx))/(bc - ad)]) / (d^4 i)
\end{aligned}$$

### Rule 2528

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*(RGx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u

```
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] := Simp[x*(a + b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_) /; FreeQ[b, x]]
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
```

)^n))/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] := -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rule 2525

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*((d\_.) + (e\_.)\*(x\_))^(m\_.), x\_Symbol] := Simp[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^n)/(e\*(m + 1)), x] - Dist[(b\*n\*p)/(e\*(m + 1)), Int[SimplifyIntegrand[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

### Rule 2486

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.), x\_Symbol] := Simp[((a + b\*x)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/b, x] + Dist[(q\*r\*s\*(b\*c - a\*d))/b, Int[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s - 1/(c + d\*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]

### Rule 31

Int[((a\_) + (b\_.)\*(x\_))^(n\_), x\_Symbol] := Simp[Log[RemoveContent[a + b\*x, x]]/b, x] /; FreeQ[{a, b}, x]

### Rule 43

Int[((a\_.) + (b\_.)\*(x\_))^(m\_.)\*((c\_.) + (d\_.)\*(x\_))^(n\_.), x\_Symbol] := Int[ExpandIntegrand[(a + b\*x)^m\*(c + d\*x)^n, x], x] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b\*c - a\*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && LeQ[7\*m + 4\*n + 4, 0]) || LtQ[9\*m + 5\*(n + 1), 0] || GtQ[m + n + 2, 0])



Rule 6688

Int[u\_, x\_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifyIntegrandQ[v, u, x]]

Rule 6742

Int[u\_, x\_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]

Rule 2499

Int[(Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.)]^(r\_.)]\*((s\_.) + Log[(i\_.)\*((g\_.) + (h\_.)\*(x\_))^(n\_.)]\*(t\_.))^(m\_.))/((j\_.) + (k\_.)\*(x\_)), x\_Symbol] := Simp[((s + t\*Log[i\*(g + h\*x)^n])^(m + 1)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r)/(k\*n\*t\*(m + 1)), x] + (-Dist[(b\*p\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(a + b\*x), x], x] - Dist[(d\*q\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(c + d\*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0] && EqQ[h\*j - g\*k, 0] && IGtQ[m, 0]

Rule 2396

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])^p)/g, x] - Dist[(b\*e\*n\*p)/g, Int[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])^(p - 1))/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p}, x] && NeQ[e\*f - d\*g, 0] && IGtQ[p, 1]

Rule 2433

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.))\*((f\_.) + Log[(h\_.)\*((i\_.) + (j\_.)\*(x\_))^(m\_.)]\*(g\_.))\*((k\_.) + (l\_.)\*(x\_))^(r\_.), x\_Symbol] := Dist[1/e, Subst[Int[((k\*x)/d)^r\*(a + b\*Log[c\*x^n])^p\*(f + g\*Log[h\*(e\*i - d\*j)/e + (j\*x)/e]^m), x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e\*k - d\*l, 0]

Rule 2374

Int[(Log[(d\_.)\*((e\_) + (f\_.)\*(x\_))^(m\_.))]\*((a\_.) + Log[(c\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)/(x\_), x\_Symbol] := -Simp[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^p)/m, x] + Dist[(b\*n\*p)/m, Int[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0] && EqQ[d\*e, 1]

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_Symbol]
:> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d, e, n, p}, x]
&& EqQ[b*d, a*e]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol]
:> Dist[1/(b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p}, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol]
:> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && NeQ[m, -1]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))^(r_.)]*
((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k_.)*(x_)), x_Symbol]
:> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a + b*x)^(p*r)] - Log[(c + d*x)^(q*r)],
Int[(s + t*Log[i*(g + h*x)^n])/(j + k*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n])]/(j + k*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n])]/(j + k*x), x)) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ[b*c - a*d, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_.) + (f_.)*(x_)^(m_.))^(r_.)]*(a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol]
:> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m - 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d, e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_.) + (e_.)*(x_)), x_Symbol]
:> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e, Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2440

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]

```

#### Rule 2434

```

Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x]
)*(f + g*Log[h*(i + j*x)^m)))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]

```

#### Rubi steps

$$\begin{aligned}
\int \frac{(ag + bgx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{84c + 84dx} dx &= \int \left( \frac{b(bc - ad)^2 g^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{84d^3} + \frac{(-bc + ad)^3 g^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d^3(84c + 84dx)} \right) dx \\
&= \frac{(bg) \int (ag + bgx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{84d} - \frac{(b(bc - ad)g^2) \int (ag + bgx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{84d^2} \\
&= \frac{b(bc - ad)^2 g^3 x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{84d^3} - \frac{(bc - ad)g^3 (a + bx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{168d^2} \\
&= \frac{b(bc - ad)^2 g^3 x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{84d^3} - \frac{(bc - ad)g^3 (a + bx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{168d^2} \\
&= \frac{b(bc - ad)^2 g^3 x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{84d^3} - \frac{(bc - ad)g^3 (a + bx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{168d^2} \\
&= \frac{b(bc - ad)^2 g^3 x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{84d^3} - \frac{(bc - ad)g^3 (a + bx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{168d^2} \\
&= \frac{5AbB(bc - ad)^2 g^3 x}{252d^3} - \frac{B(bc - ad)g^3 (a + bx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{252d^2} + \frac{aB(bc - ad)g^3 (a + bx)^2 \log \left( \frac{e(a+bx)}{c+dx} \right)}{252d^3} \\
&= \frac{5AbB(bc - ad)^2 g^3 x}{252d^3} + \frac{5B^2(bc - ad)^2 g^3 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{252d^3} - \frac{B(bc - ad)g^3 (a + bx)^2 \log \left( \frac{e(a+bx)}{c+dx} \right)}{252d^3} \\
&= \frac{5AbB(bc - ad)^2 g^3 x}{252d^3} + \frac{5B^2(bc - ad)^2 g^3 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{252d^3} - \frac{B(bc - ad)g^3 (a + bx)^2 \log \left( \frac{e(a+bx)}{c+dx} \right)}{252d^3} \\
&= \frac{5AbB(bc - ad)^2 g^3 x}{252d^3} + \frac{bB^2(bc - ad)^2 g^3 x}{252d^3} + \frac{5B^2(bc - ad)^2 g^3 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{252d^3} \\
&= \frac{5AbB(bc - ad)^2 g^3 x}{252d^3} + \frac{bB^2(bc - ad)^2 g^3 x}{252d^3} + \frac{5B^2(bc - ad)^2 g^3 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{252d^3} \\
&= \frac{5AbB(bc - ad)^2 g^3 x}{252d^3} + \frac{bB^2(bc - ad)^2 g^3 x}{252d^3} - \frac{aB^2(bc - ad)^2 g^3 \log^2(a + bx)}{84d^3} + \frac{5B^2(bc - ad)^2 g^3 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{252d^3} \\
&= \frac{5AbB(bc - ad)^2 g^3 x}{252d^3} + \frac{bB^2(bc - ad)^2 g^3 x}{252d^3} - \frac{aB^2(bc - ad)^2 g^3 \log^2(a + bx)}{84d^3} + \frac{5B^2(bc - ad)^2 g^3 (a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{252d^3}
\end{aligned}$$

**Mathematica [B]** time = 1.85366, size = 4802, normalized size = 6.69

Result too large to show

Antiderivative was successfully verified.

[In] Integrate[((a\*g + b\*g\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))^2)/(c\*i + d\*i\*x), x]

[Out] (g^3\*(36\*A\*b^3\*B\*c^3 - 144\*a\*A\*b^2\*B\*c^2\*d - 66\*a\*b^2\*B^2\*c^2\*d + 216\*a^2\*A\*b\*B\*c\*d^2 + 162\*a^2\*b\*B^2\*c\*d^2 - 108\*a^3\*A\*B\*d^3 - 108\*a^3\*B^2\*d^3 + 18\*A^2\*b^3\*c^2\*d\*x + 30\*A\*b^3\*B\*c^2\*d\*x + 6\*b^3\*B^2\*c^2\*d\*x - 54\*a\*A^2\*b^2\*c\*d^2\*x - 72\*a\*A\*b^2\*B\*c\*d^2\*x - 12\*a\*b^2\*B^2\*c\*d^2\*x + 54\*a^2\*A^2\*b\*d^3\*x + 42\*a^2\*A\*b\*B\*d^3\*x + 6\*a^2\*b\*B^2\*d^3\*x - 9\*A^2\*b^3\*c\*d^2\*x^2 - 6\*A\*b^3\*B\*c\*d^2\*x^2 + 27\*a\*A^2\*b^2\*d^3\*x^2 + 6\*a\*A\*b^2\*B\*d^3\*x^2 + 6\*A^2\*b^3\*d^3\*x^3 - 36\*b^3\*B^2\*c^3\*Log[a/b + x] + 36\*a\*A\*b^2\*B\*c^2\*d\*Log[a/b + x] + 174\*a\*b^2\*B^2\*c^2\*d\*Log[a/b + x] - 108\*a^2\*A\*b\*B\*c\*d^2\*Log[a/b + x] - 297\*a^2\*b\*B^2\*c\*d^2\*Log[a/b + x] + 108\*a^3\*A\*B\*d^3\*Log[a/b + x] + 167\*a^3\*B^2\*d^3\*Log[a/b + x] - 18\*a\*b^2\*B^2\*c^2\*d\*Log[a/b + x]^2 + 63\*a^2\*b\*B^2\*c\*d^2\*Log[a/b + x]^2 - 75\*a^3\*B^2\*d^3\*Log[a/b + x]^2 - 36\*A\*b^3\*B\*c^3\*Log[c/d + x] - 49\*b^3\*B^2\*c^3\*Log[c/d + x] + 108\*a\*A\*b^2\*B\*c^2\*d\*Log[c/d + x] + 45\*a\*b^2\*B^2\*c^2\*d\*Log[c/d + x] - 108\*a^2\*A\*b\*B\*c\*d^2\*Log[c/d + x] + 108\*a^2\*b\*B^2\*c\*d^2\*Log[c/d + x] - 108\*a^3\*B^2\*d^3\*Log[c/d + x] + 36\*b^3\*B^2\*c^3\*Log[a/b + x]\*Log[c/d + x] - 108\*a\*b^2\*B^2\*c^2\*d\*Log[a/b + x]\*Log[c/d + x] + 90\*a^2\*b\*B^2\*c\*d^2\*Log[a/b + x]\*Log[c/d + x] + 42\*a^3\*B^2\*d^3\*Log[a/b + x]\*Log[c/d + x] + 18\*A\*b^3\*B\*c^3\*Log[c/d + x]^2 - 3\*b^3\*B^2\*c^3\*Log[c/d + x]^2 - 54\*a\*A\*b^2\*B\*c^2\*d\*Log[c/d + x]^2 + 27\*a\*b^2\*B^2\*c^2\*d\*Log[c/d + x]^2 + 54\*a^2\*A\*b\*B\*c\*d^2\*Log[c/d + x]^2 - 54\*a^2\*b\*B^2\*c\*d^2\*Log[c/d + x]^2 - 18\*a^3\*A\*B\*d^3\*Log[c/d + x]^2 + 12\*b^3\*B^2\*c^3\*Log[c/d + x]^3 - 36\*a\*b^2\*B^2\*c^2\*d\*Log[c/d + x]^3 + 36\*a^2\*b\*B^2\*c\*d^2\*Log[c/d + x]^3 + 18\*a^2\*A\*b\*B\*c\*d^2\*Log[a + b\*x] + 15\*a^2\*b\*B^2\*c\*d^2\*Log[a + b\*x] - 42\*a^3\*A\*B\*d^3\*Log[a + b\*x] - 23\*a^3\*B^2\*d^3\*Log[a + b\*x] - 18\*a^2\*b\*B^2\*c\*d^2\*Log[a/b + x]\*Log[a + b\*x] + 42\*a^3\*B^2\*d^3\*Log[a/b + x]\*Log[a + b\*x] + 18\*a^2\*b\*B^2\*c\*d^2\*Log[c/d + x]\*Log[a + b\*x] - 42\*a^3\*B^2\*d^3\*Log[c/d + x]\*Log[a + b\*x] - 18\*b^3\*B^2\*c^3\*Log[c/d + x]^2\*Log[(d\*(a + b\*x))/(-b\*c) + a\*d] + 54\*a\*b^2\*B^2\*c^2\*d\*Log[c/d + x]^2\*Log[(d\*(a + b\*x))/(-b\*c) + a\*d] - 54\*a^2\*b\*B^2\*c\*d^2\*Log[c/d + x]^2\*Log[(d\*(a + b\*x))/(-b\*c) + a\*d] + 36\*b^3\*B^2\*c^3\*Log[(e\*(a + b\*x))/(c + d\*x)] - 144\*a\*b^2\*B^2\*c^2\*d\*Log[(e\*(a + b\*x))/(c + d\*x)] + 216\*a^2\*b\*B^2\*c\*d^2\*Log[(e\*(a + b\*x))/(c + d\*x)] - 108\*a^3\*B^2\*d^3\*Log[(e\*(a + b\*x))/(c + d\*x)] + 36\*A\*b^3\*B\*c^2\*d\*x\*Log[(e\*(a + b\*x))/(c + d\*x)] + 30\*b^3\*B^2\*c^2\*d\*x\*Log[(e\*(a + b\*x))/(c + d\*x)] - 108\*a\*A\*b^2\*B\*c\*d^2\*x\*Log[(e\*(a + b\*x))/(c + d\*x)] - 72\*a\*b^2\*B^2\*c\*d^2\*x\*Log[(e\*(a + b\*x))/(c + d\*x)] + 108\*a^2\*A\*b\*B\*d^3\*x\*Log[(e\*(a + b\*x))/(c + d\*x)] + 42\*a^2\*b\*B^2\*d^3\*x\*Log[(e\*(a + b\*x))/(c + d\*x)] - 18\*A\*b^3\*B\*c\*d^2\*x^2\*Log[(e\*(a + b\*x))/(c + d\*x)] - 6\*b^3\*B^2\*c\*d^2\*x^2\*L

$$\begin{aligned}
& \log[(e*(a + b*x))/(c + d*x)] + 54*a*A*b^2*B^d^3*x^2*\log[(e*(a + b*x))/(c + d*x)] + 6*a*b^2*B^2*d^3*x^2*\log[(e*(a + b*x))/(c + d*x)] + 12*A*b^3*B*d^3*x^3*\log[(e*(a + b*x))/(c + d*x)] + 36*a*b^2*B^2*c^2*d*\log[a/b + x]*\log[(e*(a + b*x))/(c + d*x)] - 108*a^2*b*B^2*c*d^2*\log[a/b + x]*\log[(e*(a + b*x))/(c + d*x)] + 108*a^3*B^2*d^3*\log[a/b + x]*\log[(e*(a + b*x))/(c + d*x)] - 36*b^3*B^2*c^3*\log[c/d + x]*\log[(e*(a + b*x))/(c + d*x)] + 108*a*b^2*B^2*c^2*d*\log[c/d + x]*\log[(e*(a + b*x))/(c + d*x)] - 108*a^2*b*B^2*c*d^2*\log[c/d + x]*\log[(e*(a + b*x))/(c + d*x)] + 18*b^3*B^2*c^3*\log[c/d + x]^2*\log[(e*(a + b*x))/(c + d*x)] - 54*a*b^2*B^2*c^2*d*\log[c/d + x]^2*\log[(e*(a + b*x))/(c + d*x)] + 54*a^2*b*B^2*c*d^2*\log[c/d + x]^2*\log[(e*(a + b*x))/(c + d*x)] + 18*a^2*b*B^2*c*d^2*\log[a + b*x]*\log[(e*(a + b*x))/(c + d*x)] - 42*a^3*B^2*d^3*\log[a + b*x]*\log[(e*(a + b*x))/(c + d*x)] + 18*b^3*B^2*c^2*d*x*\log[(e*(a + b*x))/(c + d*x)]^2 - 54*a*b^2*B^2*c*d^2*x*\log[(e*(a + b*x))/(c + d*x)]^2 + 54*a^2*b*B^2*d^3*x*\log[(e*(a + b*x))/(c + d*x)]^2 - 9*b^3*B^2*c*d^2*x^2*\log[(e*(a + b*x))/(c + d*x)]^2 + 27*a*b^2*B^2*d^3*x^2*\log[(e*(a + b*x))/(c + d*x)]^2 + 6*b^3*B^2*d^3*x^3*\log[(e*(a + b*x))/(c + d*x)]^2 - 18*A^2*b^3*c^3*\log[c + d*x] - 30*A*b^3*B*c^3*\log[c + d*x] + 49*b^3*B^2*c^3*\log[c + d*x] + 54*a*A^2*b^2*c^2*d*\log[c + d*x] + 54*a*A*b^2*B*c^2*d*\log[c + d*x] - 111*a*b^2*B^2*c^2*d*\log[c + d*x] - 54*a^2*A^2*b*c*d^2*\log[c + d*x] + 66*a^2*b*B^2*c*d^2*\log[c + d*x] + 18*a^3*A^2*d^3*\log[c + d*x] + 36*A*b^3*B*c^3*\log[a/b + x]*\log[c + d*x] + 30*b^3*B^2*c^3*\log[a/b + x]*\log[c + d*x] - 108*a*A*b^2*B*c^2*d*\log[a/b + x]*\log[c + d*x] - 54*a*b^2*B^2*c^2*d*\log[a/b + x]*\log[c + d*x] + 108*a^2*A*b*B*c*d^2*\log[a/b + x]*\log[c + d*x] - 36*a^3*A*B*d^3*\log[a/b + x]*\log[c + d*x] - 18*b^3*B^2*c^3*\log[a/b + x]^2*\log[c + d*x] + 54*a*b^2*B^2*c^2*d*\log[a/b + x]^2*\log[c + d*x] - 54*a^2*b*B^2*c*d^2*\log[a/b + x]^2*\log[c + d*x] - 36*A*b^3*B*c^3*\log[c/d + x]*\log[c + d*x] - 30*b^3*B^2*c^3*\log[c/d + x]*\log[c + d*x] + 108*a*A*b^2*B*c^2*d*\log[c/d + x]*\log[c + d*x] + 54*a*b^2*B^2*c^2*d*\log[c/d + x]*\log[c + d*x] - 108*a^2*A*b*B*c*d^2*\log[c/d + x]*\log[c + d*x] + 36*a^3*A*B*d^3*\log[c/d + x]*\log[c + d*x] + 36*b^3*B^2*c^3*\log[a/b + x]*\log[c/d + x]*\log[c + d*x] - 108*a*b^2*B^2*c^2*d*\log[a/b + x]*\log[c/d + x]*\log[c + d*x] + 108*a^2*b*B^2*c*d^2*\log[a/b + x]*\log[c/d + x]*\log[c + d*x] - 18*b^3*B^2*c^3*\log[c/d + x]^2*\log[c + d*x] + 54*a*b^2*B^2*c^2*d*\log[c/d + x]^2*\log[c + d*x] - 54*a^2*b*B^2*c*d^2*\log[c/d + x]^2*\log[c + d*x] - 36*A*b^3*B*c^3*\log[(e*(a + b*x))/(c + d*x)]*\log[c + d*x] - 30*b^3*B^2*c^3*\log[(e*(a + b*x))/(c + d*x)]*\log[c + d*x] + 108*a*A*b^2*B*c^2*d*\log[(e*(a + b*x))/(c + d*x)]*\log[c + d*x] + 54*a*b^2*B^2*c^2*d*\log[(e*(a + b*x))/(c + d*x)]*\log[c + d*x] - 108*a^2*A*b*B*c*d^2*\log[(e*(a + b*x))/(c + d*x)]*\log[c + d*x] + 36*a^3*A*B*d^3*\log[(e*(a + b*x))/(c + d*x)]*\log[c + d*x] + 36*b^3*B^2*c^3*\log[a/b + x]*\log[(e*(a + b*x))/(c + d*x)]*\log[c + d*x] - 108*a*b^2*B^2*c^2*d*\log[a/b + x]*\log[(e*(a + b*x))/(c + d*x)]*\log[c + d*x] + 108*a^2*b*B^2*c*d^2*\log[a/b + x]*\log[(e*(a + b*x))/(c + d*x)]*\log[c + d*x] - 36*b^3*B^2*c^3*\log[c/d + x]*\log[(e*(a + b*x))/(c + d*x)]*\log[c + d*x] + 108*a*b^2*B^2*c^2*d*\log[c/d + x]*\log[(e*(a + b*x))/(c + d*x)]*\log[c + d*x] - 108*a^2*b*B^2*c*d^2*\log[c/d + x]*\log[(e*(a + b*x))/(c + d*x)]*\log[c + d*x] - 18*b^3*B^2*c^3*\log[(e*(a + b*x))/(c + d*x)]^2*\log[c + d*x] + 54*a*b^2*
\end{aligned}$$

```

B^2*c^2*d*Log[(e*(a + b*x))/(c + d*x)]^2*Log[c + d*x] - 54*a^2*b*B^2*c*d^2*
Log[(e*(a + b*x))/(c + d*x)]^2*Log[c + d*x] - 36*A*b^3*B*c^3*Log[a/b + x]*L
og[(b*(c + d*x))/(b*c - a*d)] - 66*b^3*B^2*c^3*Log[a/b + x]*Log[(b*(c + d*x)
))/(b*c - a*d)] + 108*a*A*b^2*B*c^2*d*Log[a/b + x]*Log[(b*(c + d*x))/(b*c -
a*d)] + 198*a*b^2*B^2*c^2*d*Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] -
108*a^2*A*b*B*c*d^2*Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] - 198*a^2*b
*B^2*c*d^2*Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] + 36*a^3*A*B*d^3*Log
[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] + 66*a^3*B^2*d^3*Log[a/b + x]*Log[
(b*(c + d*x))/(b*c - a*d)] + 18*b^3*B^2*c^3*Log[a/b + x]^2*Log[(b*(c + d*x)
))/(b*c - a*d)] - 54*a*b^2*B^2*c^2*d*Log[a/b + x]^2*Log[(b*(c + d*x))/(b*c -
a*d)] + 54*a^2*b*B^2*c*d^2*Log[a/b + x]^2*Log[(b*(c + d*x))/(b*c - a*d)] -
36*b^3*B^2*c^3*Log[a/b + x]*Log[c/d + x]*Log[(b*(c + d*x))/(b*c - a*d)] +
108*a*b^2*B^2*c^2*d*Log[a/b + x]*Log[c/d + x]*Log[(b*(c + d*x))/(b*c - a*d)
] - 108*a^2*b*B^2*c*d^2*Log[a/b + x]*Log[c/d + x]*Log[(b*(c + d*x))/(b*c -
a*d)] - 36*b^3*B^2*c^3*Log[a/b + x]*Log[(e*(a + b*x))/(c + d*x)]*Log[(b*(c
+ d*x))/(b*c - a*d)] + 108*a*b^2*B^2*c^2*d*Log[a/b + x]*Log[(e*(a + b*x))/(
c + d*x)]*Log[(b*(c + d*x))/(b*c - a*d)] - 108*a^2*b*B^2*c*d^2*Log[a/b + x]
*Log[(e*(a + b*x))/(c + d*x)]*Log[(b*(c + d*x))/(b*c - a*d)] - 18*a^3*B^2*d
^3*Log[(e*(a + b*x))/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] - 6*B*((6*
A + 11*B)*(b*c - a*d)^3 + 6*b*B*c*(b^2*c^2 - 3*a*b*c*d + 3*a^2*d^2)*Log[c/d
+ x] + 6*b*B*c*(b^2*c^2 - 3*a*b*c*d + 3*a^2*d^2)*Log[(e*(a + b*x))/(c + d*
x)])*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)] - 36*a^3*B^2*d^3*Log[(e*(a +
b*x))/(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - 36*b^3*B^2*c^3*L
og[c/d + x]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] + 108*a*b^2*B^2*c^2*d*Log
[c/d + x]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] - 108*a^2*b*B^2*c*d^2*Log[c
/d + x]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] + 36*b^3*B^2*c^3*PolyLog[3, (
d*(a + b*x))/(-(b*c) + a*d)] - 108*a*b^2*B^2*c^2*d*PolyLog[3, (d*(a + b*x)
)/(-(b*c) + a*d)] + 108*a^2*b*B^2*c*d^2*PolyLog[3, (d*(a + b*x))/(-(b*c) + a
*d)] + 36*a^3*B^2*d^3*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))] + 36*b^3*B^2*
c^3*PolyLog[3, (b*(c + d*x))/(b*c - a*d)] - 108*a*b^2*B^2*c^2*d*PolyLog[3,
(b*(c + d*x))/(b*c - a*d)] + 108*a^2*b*B^2*c*d^2*PolyLog[3, (b*(c + d*x))/
(b*c - a*d)))/(18*d^4*i)

```

---

**Maple [F]** time = 2.514, size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^3}{dix + ci} \left( A + B \ln \left( \frac{e(bx + a)}{dx + c} \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^3\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i), x)

[Out]  $\int ((b*gx+a*g)^3*(A+B*\ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i), x)$

**Maxima [F]** time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*gx+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x, algorithm="maxima")`

[Out] 
$$3A^2a^2b^3g^3\left(\frac{x}{d^i} - \frac{c \log(dx + c)}{d^{2i}}\right) - \frac{1}{6}A^2b^3g^3\left(\frac{6c^3 \log(dx + c)}{d^{4i}} - \frac{(2d^2x^3 - 3cdx^2 + 6c^2x)}{d^{3i}}\right) + \frac{3}{2}A^2ab^2g^3\left(\frac{2c^2 \log(dx + c)}{d^{3i}} + \frac{(dx^2 - 2cx)}{d^{2i}}\right) + A^2a^3g^3 \log(dix + ci) / d^i - \frac{1}{6}(2(b^3c^3g^3 - 3ab^2c^2dg^3 + 3a^2b^3cd^2g^3 - a^3d^3g^3)B^2 \log(dx + c)^3 - (2B^2b^3d^3g^3x^3 - 3(b^3cd^2g^3 - 3ab^2d^3g^3)B^2x^2 + 6(b^3c^2dg^3 - 3ab^2cd^2g^3 + 3a^2bd^3g^3)B^2x) \log(dx + c)^2) / d^{4i} - \int (-1/3(3B^2a^3d^2g^3 \log(e)^2 + 6ABa^3d^2g^3 \log(e) + 3(B^2b^3d^2g^3 \log(e)^2 + 2ABb^3d^2g^3 \log(e)))x^3 + 9(B^2ab^2d^2g^3 \log(e)^2 + 2ABab^2d^2g^3 \log(e))x^2 + 3(B^2b^3d^2g^3x^3 + 3B^2ab^2d^2g^3x^2 + 3B^2a^2bd^2g^3x + B^2a^3d^2g^3) \log(bx + a)^2 + 9(B^2a^2bd^2g^3 \log(e)^2 + 2ABa^2bd^2g^3 \log(e))x + 6(B^2a^3d^2g^3 \log(e) + ABa^3d^2g^3 + (B^2b^3d^2g^3 \log(e) + ABb^3d^2g^3)x^3 + 3(B^2ab^2d^2g^3 \log(e) + ABab^2d^2g^3)x^2 + 3(B^2a^2bd^2g^3 \log(e) + ABa^2bd^2g^3)x) \log(bx + a) - (6B^2a^3d^2g^3 \log(e) + 6ABa^3d^2g^3 + 2(3ABb^3d^2g^3 + (3g^3 \log(e) + g^3)B^2b^3d^2) x^3 + 3(6ABab^2d^2g^3 - (b^3cd^2g^3 - 3(2g^3 \log(e) + g^3)ab^2d^2)B^2) x^2 + 6(3ABa^2bd^2g^3 + (b^3c^2g^3 - 3ab^2cd^2g^3 + 3(g^3 \log(e) + g^3)a^2bd^2)B^2) x + 6(B^2b^3d^2g^3x^3 + 3B^2ab^2d^2g^3x^2 + 3B^2a^2bd^2g^3x + B^2a^3d^2g^3) \log(bx + a)) \log(dx + c)) / d^{3i} + cd^{2i}, x)$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{A^2b^3g^3x^3 + 3A^2ab^2g^3x^2 + 3A^2a^2bg^3x + A^2a^3g^3 + (B^2b^3g^3x^3 + 3B^2ab^2g^3x^2 + 3B^2a^2bg^3x + B^2a^3g^3) \log\left(\frac{bex+a}{dx+ci}\right)}{dix + ci} \right)$$

Verification of antiderivative is not currently implemented for this CAS.



```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x, algorithm="fricas")
```

```
[Out] integral((A^2*b^3*g^3*x^3 + 3*A^2*a*b^2*g^3*x^2 + 3*A^2*a^2*b*g^3*x + A^2*a^3*g^3 + (B^2*b^3*g^3*x^3 + 3*B^2*a*b^2*g^3*x^2 + 3*B^2*a^2*b*g^3*x + B^2*a^3*g^3)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*b^3*g^3*x^3 + 3*A*B*a*b^2*g^3*x^2 + 3*A*B*a^2*b*g^3*x + A*B*a^3*g^3)*log((b*e*x + a*e)/(d*x + c)))/(d*i*x + c*i), x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^3 \left( B \log\left(\frac{(bx+a)e}{dx+c}\right) + A \right)^2}{dix + ci} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(d*i*x + c*i), x)
```

$$3.85 \quad \int \frac{(ag+bgx)^2 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)^2}{ci+dx} dx$$

**Optimal.** Leaf size=536

$$\frac{2Bg^2(bc-ad)^2 \text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{d^3i} - \frac{4B^2g^2(bc-ad)^2 \text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)}{d^3i} - \frac{B^2g^2(bc-ad)^2 \text{PolyLog}\left(3, \frac{d(a+bx)}{b(c+dx)}\right)}{d^3i}$$

```
[Out] -((B*(b*c - a*d)*g^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x]])))/(d^2*i)
) - (4*B*(b*c - a*d)^2*g^2*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a
+ b*x))/(c + d*x]])))/(d^3*i) - (2*(b*c - a*d)*g^2*(a + b*x)*(A + B*Log[(e*
(a + b*x))/(c + d*x]]^2)/(d^2*i) + (b^2*g^2*(c + d*x)^2*(A + B*Log[(e*(a +
b*x))/(c + d*x]]^2)/(2*d^3*i) - ((b*c - a*d)^2*g^2*Log[(b*c - a*d)/(b*(c
+ d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x]]^2)/(d^3*i) + (B^2*(b*c - a*d)
^2*g^2*Log[c + d*x]])/(d^3*i) + (B*(b*c - a*d)^2*g^2*(A + B*Log[(e*(a + b*x)
)/(c + d*x]])*Log[1 - (b*(c + d*x))/(d*(a + b*x))]])/(d^3*i) - (4*B^2*(b*c -
a*d)^2*g^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))]])/(d^3*i) - (2*B*(b*c -
a*d)^2*g^2*(A + B*Log[(e*(a + b*x))/(c + d*x]])*PolyLog[2, (d*(a + b*x))/(b
*(c + d*x))]])/(d^3*i) - (B^2*(b*c - a*d)^2*g^2*PolyLog[2, (b*(c + d*x))/(d*
(a + b*x))]])/(d^3*i) + (2*B^2*(b*c - a*d)^2*g^2*PolyLog[3, (d*(a + b*x))/(b
*(c + d*x))]])/(d^3*i)
```

**Rubi [B]** time = 4.82488, antiderivative size = 1666, normalized size of antiderivative = 3.11, number of steps used = 86, number of rules used = 27, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.643$ , Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 2486, 31, 6688, 6742, 2499, 2396, 2433, 2374, 6589, 2302, 30, 2500, 2375, 2317, 2440, 2434}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x]]^2)/(c*i + d*i*x),
x]
```

```
[Out] -((A*b*B*(b*c - a*d)*g^2*x)/(d^2*i)) + (a*B^2*(b*c - a*d)*g^2*Log[a + b*x]^
2)/(d^2*i) - (B^2*(b*c - a*d)^2*g^2*Log[a + b*x]*Log[(c + d*x)^(-1)]^2)/(d^
3*i) + (B^2*(b*c - a*d)^2*g^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*
x)^(-1)]^2)/(d^3*i) - (B^2*(b*c - a*d)*g^2*(a + b*x)*Log[(e*(a + b*x))/(c +
d*x]])/(d^2*i) - (2*a*B*(b*c - a*d)*g^2*Log[a + b*x]*(A + B*Log[(e*(a + b*
x))/(c + d*x]])))/(d^2*i) - (b*(b*c - a*d)*g^2*x*(A + B*Log[(e*(a + b*x))/(c
```

$$\begin{aligned}
& + d*x))^{2})/(d^{2*i}) + (g^{2*(a + b*x)^{2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x])})^{2})/(2*d*i) + (B^{2*(b*c - a*d)^{2*g^{2*\text{Log}[c + d*x]}}/(d^{3*i}) - (2*b*B^{2*c*(b*c - a*d)*g^{2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x]}}/(d^{3*i}) - (B^{2*(b*c - a*d)^{2*g^{2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x]}}/(d^{3*i}) \\
& + (2*b*B*c*(b*c - a*d)*g^{2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x])})*\text{Log}[c + d*x]}/(d^{3*i}) + (B*(b*c - a*d)^{2*g^{2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x])})}*\text{Log}[c + d*x]}/(d^{3*i}) + (b*B^{2*c*(b*c - a*d)*g^{2*\text{Log}[c + d*x]^{2}}/(d^{3*i}) + (B^{2*(b*c - a*d)^{2*g^{2*\text{Log}[c + d*x]^{2}}/(2*d^{3*i}) - (2*a*B^{2*(b*c - a*d)*g^{2*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d])}}/(d^{2*i}) + (B^{2*(b*c - a*d)^{2*g^{2*\text{Log}[a + b*x]^{2*\text{Log}[(b*(c + d*x))/(b*c - a*d])}}/(d^{3*i}) - (B^{2*(b*c - a*d)^{2*g^{2*\text{Log}[a + b*x]^{2*\text{Log}[i*(c + d*x)]}}/(d^{3*i}) - (2*B^{2*(b*c - a*d)^{2*g^{2*\text{Log}[a + b*x]*\text{Log}[(c + d*x)^{-1}]*\text{Log}[i*(c + d*x)]}}/(d^{3*i}) + (A*B*(b*c - a*d)^{2*g^{2*\text{Log}[i*(c + d*x)]^{2}}/(d^{3*i}) - (B^{2*(b*c - a*d)^{2*g^{2*\text{Log}[a + b*x]*\text{Log}[i*(c + d*x)]^{2}}/(d^{3*i}) + (B^{2*(b*c - a*d)^{2*g^{2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[i*(c + d*x)]^{2}}/(d^{3*i}) + (B^{2*(b*c - a*d)^{2*g^{2*\text{Log}[i*(c + d*x)]^{3}}/(3*d^{3*i}) - (2*A*B*(b*c - a*d)^{2*g^{2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c*i + d*i*x]}}/(d^{3*i}) + (2*B^{2*(b*c - a*d)^{2*g^{2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*(\text{Log}[a + b*x] + \text{Log}[(c + d*x)^{-1}] - \text{Log}[(e*(a + b*x))/(c + d*x])})*\text{Log}[c*i + d*i*x]}}/(d^{3*i}) + ((b*c - a*d)^{2*g^{2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x])})^{2*\text{Log}[c*i + d*i*x]}}/(d^{3*i}) - (B^{2*(b*c - a*d)^{2*g^{2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c*i + d*i*x]^{2}}/(d^{3*i}) + (B^{2*(b*c - a*d)^{2*g^{2*\text{Log}[(e*(a + b*x))/(c + d*x])*\text{Log}[c*i + d*i*x]^{2}}/(d^{3*i}) - (2*a*B^{2*(b*c - a*d)*g^{2*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]}/(d^{2*i}) + (2*B^{2*(b*c - a*d)^{2*g^{2*\text{Log}[a + b*x]*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]})/(d^{3*i}) - (2*b*B^{2*c*(b*c - a*d)*g^{2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]}}/(d^{3*i}) - (2*A*B*(b*c - a*d)^{2*g^{2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]}}/(d^{3*i}) - (B^{2*(b*c - a*d)^{2*g^{2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]}}/(d^{3*i}) - (2*B^{2*(b*c - a*d)^{2*g^{2*\text{Log}[(c + d*x)^{-1}]*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]}}/(d^{3*i}) + (2*B^{2*(b*c - a*d)^{2*g^{2*(\text{Log}[a + b*x] + \text{Log}[(c + d*x)^{-1}] - \text{Log}[(e*(a + b*x))/(c + d*x])})*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]}}/(d^{3*i}) - (2*B^{2*(b*c - a*d)^{2*g^{2*\text{PolyLog}[3, -((d*(a + b*x))/(b*c - a*d))]}(d^{3*i}) - (2*B^{2*(b*c - a*d)^{2*g^{2*\text{PolyLog}[3, (b*(c + d*x))/(b*c - a*d)]}}(d^{3*i})
\end{aligned}$$

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

```

### Rule 2523

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] := Simp[x*(a +
b*Log[c*RFx^p])^n, x] - Dist[b^n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*

```

$\text{RFX}^p)^{(n-1)} * D[\text{RFX}, x] / \text{RFX}, x], x] /;$  FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0]

### Rule 12

Int[(a\_)\*(u\_), x\_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b\_)\*(v\_) /; FreeQ[b, x]]

### Rule 2524

Int[((a\_.) + Log[(c\_.)\*(RFX\_)^(p\_.)]\*(b\_.))^(n\_.)/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] :> Simp[(Log[d + e\*x]\*(a + b\*Log[c\*RFX^p])^n)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[d + e\*x]\*(a + b\*Log[c\*RFX^p])^(n-1)\*D[RFX, x])/RFX, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0]

### Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*(RFX\_), x\_Symbol] :> With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n])^p, RFX, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFX, x] && IntegerQ[p]

### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.)\*(x\_))^(q\_.), x\_Symbol] :> Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] :> Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :> Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n]))/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))])\*(b\_.)/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :> Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x]

], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] := -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rule 2525

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*((d\_.) + (e\_.)\*(x\_)^(m\_.)), x\_Symbol] := Simp[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^n)/(e\*(m + 1)), x] - Dist[(b\*n\*p)/(e\*(m + 1)), Int[SimplifyIntegrand[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

### Rule 2486

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_)^(p\_.))\*((c\_.) + (d\_.)\*(x\_)^(q\_.))^(r\_.)]^(s\_.), x\_Symbol] := Simp[((a + b\*x)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/b, x] + Dist[(q\*r\*s\*(b\*c - a\*d))/b, Int[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1)/(c + d\*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]

### Rule 31

Int[((a\_) + (b\_.)\*(x\_)^(-1)), x\_Symbol] := Simp[Log[RemoveContent[a + b\*x, x]]/b, x] /; FreeQ[{a, b}, x]

### Rule 6688

Int[u\_, x\_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifierIntegrandQ[v, u, x]]

### Rule 6742

Int[u\_, x\_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]

### Rule 2499

Int[(Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_)^(p\_.))\*((c\_.) + (d\_.)\*(x\_)^(q\_.))^(r\_.)]\*(s\_.) + Log[(i\_.)\*((g\_.) + (h\_.)\*(x\_)^(n\_.)]\*(t\_.))^(m\_.))/(j\_.) + (k\_.)\*(x\_)), x\_Symbol] := Simp[((s + t\*Log[i\*(g + h\*x)^n])^(m + 1)\*Log[

$$e*(f*(a + b*x)^p*(c + d*x)^q)^r)/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dist[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]$$

### Rule 2396

$$Int[((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_.))^(n_.)]*(b_.))^(p_.)/((f_.) + (g_.)*(x_.)), x\_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]$$

### Rule 2433

$$Int[((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_.))^(n_.)]*(b_.))^(p_.)*((f_.) + Log[(h_.)*((i_.) + (j_.)*(x_.))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_.))^(r_.), x\_Symbol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(e*i - d*j)/e + (j*x)/e]^m), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]$$

### Rule 2374

$$Int[(Log[(d_.)*((e_.) + (f_.)*(x_.))^(m_.))]*((a_.) + Log[(c_.)*(x_.))^(n_.)]*(b_.))^(p_.)/(x_), x\_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0] && EqQ[d*e, 1]$$

### Rule 6589

$$Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_.))^(p_.)]/((d_.) + (e_.)*(x_.)), x\_Symbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d, e, n, p}, x] && EqQ[b*d, a*e]$$

### Rule 2302

$$Int[((a_.) + Log[(c_.)*(x_.))^(n_.)]*(b_.))^(p_.)/(x_), x\_Symbol] :> Dist[1/(b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p}, x]$$

### Rule 30

Int[(x\_)^(m\_), x\_Symbol] := Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && NeQ[m, -1]

### Rule 2500

Int[(Log[(e\_)\*((f\_)\*((a\_) + (b\_)\*(x\_))^(p\_))\*((c\_) + (d\_)\*(x\_))^(q\_))]^(r\_)]\*((s\_) + Log[(i\_)\*((g\_) + (h\_)\*(x\_))^(n\_)]\*(t\_)))/((j\_) + (k\_)\*(x\_)), x\_Symbol] := Dist[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q)^r] - Log[(a + b\*x)^(p\*r)] - Log[(c + d\*x)^(q\*r)], Int[(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x] + (Int[(Log[(a + b\*x)^(p\*r)]\*(s + t\*Log[i\*(g + h\*x)^n]))/(j + k\*x), x] + Int[(Log[(c + d\*x)^(q\*r)]\*(s + t\*Log[i\*(g + h\*x)^n]))/(j + k\*x), x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0]

### Rule 2375

Int[(Log[(d\_)\*((e\_) + (f\_)\*(x\_))^(m\_))]^(r\_)]\*((a\_) + Log[(c\_)\*(x\_))^(n\_)]\*(b\_))^(p\_))/(x\_), x\_Symbol] := Simp[(Log[d\*(e + f\*x^m)^r]\*(a + b\*Log[c\*x^n])^(p + 1))/(b\*n\*(p + 1)), x] - Dist[(f\*m\*r)/(b\*n\*(p + 1)), Int[(x^(m - 1)\*(a + b\*Log[c\*x^n])^(p + 1))/(e + f\*x^m), x], x] /; FreeQ[{a, b, c, d, e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d\*e, 1]

### Rule 2317

Int[((a\_) + Log[(c\_)\*(x\_))^(n\_)]\*(b\_))^(p\_)/((d\_) + (e\_)\*(x\_)), x\_Symbol] := Simp[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^p)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

### Rule 2440

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_))^(n\_)]\*(b\_))\*((f\_) + Log[(h\_)\*((i\_) + (j\_)\*(x\_))^(m\_)]\*(g\_)))/((k\_) + (l\_)\*(x\_))^(r\_), x\_Symbol] := Dist[1/l, Subst[Int[x^r\*(a + b\*Log[c\*(-((e\*k - d\*1)/l) + (e\*x)/l)^n])\*(f + g\*Log[h\*(-((j\*k - i\*1)/l) + (j\*x)/l)^m]), x], x, k + l\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]

### Rule 2434

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_))^(n\_)]\*(b\_))\*((f\_) + Log[(h\_)\*((i\_) + (j\_)\*(x\_))^(m\_)]\*(g\_)))/((k\_) + (l\_)\*(x\_))^(r\_), x\_Symbol] := Simp[Log[x]\*(a + b\*Log[c\*(d + e\*x)^n])\*(f + g\*Log[h\*(i + j\*x)^m]), x] + (-Dist[e\*g\*m, Int[(Log[x]\*(a + b\*Log[c\*(d + e\*x)^n])]/(d + e\*x), x], x] - Dist[b\*j\*n, Int[(Log[x]\*(f + g\*Log[h\*(i + j\*x)^m))]/(i + j\*x), x], x]) /; FreeQ[{a, b, c, d, e, f

, g, h, i, j, m, n}, x] && EqQ[e\*i - d\*j, 0]

Rubi steps



$$\begin{aligned}
\int \frac{(ag + bgx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{85c + 85dx} dx &= \int \left( -\frac{b(bc - ad)g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{85d^2} + \frac{(bc - ad)^2 g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{d^2(85c + 85dx)} \right) dx \\
&= \frac{(bg) \int (ag + bgx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{85d} - \frac{(b(bc - ad)g^2) \int \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{85d^2} \\
&= -\frac{b(bc - ad)g^2 x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{85d^2} + \frac{g^2(a + bx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{170d} \\
&= -\frac{b(bc - ad)g^2 x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{85d^2} + \frac{g^2(a + bx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{170d} \\
&= -\frac{b(bc - ad)g^2 x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{85d^2} + \frac{g^2(a + bx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{170d} \\
&= -\frac{b(bc - ad)g^2 x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{85d^2} + \frac{g^2(a + bx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{170d} \\
&= -\frac{AbB(bc - ad)g^2 x}{85d^2} - \frac{2aB(bc - ad)g^2 \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{85d^2} - \frac{b(b^2 - a^2)g^2 \log^2(a + bx)}{85d^2} \\
&= -\frac{AbB(bc - ad)g^2 x}{85d^2} - \frac{B^2(bc - ad)g^2(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{85d^2} - \frac{2aB(bc - ad)g^2 \log(a + bx)}{85d^2} \\
&= -\frac{AbB(bc - ad)g^2 x}{85d^2} - \frac{B^2(bc - ad)g^2(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{85d^2} - \frac{2aB(bc - ad)g^2 \log(a + bx)}{85d^2} \\
&= -\frac{AbB(bc - ad)g^2 x}{85d^2} - \frac{B^2(bc - ad)g^2(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{85d^2} - \frac{2aB(bc - ad)g^2 \log(a + bx)}{85d^2} \\
&= -\frac{AbB(bc - ad)g^2 x}{85d^2} + \frac{aB^2(bc - ad)g^2 \log^2(a + bx)}{85d^2} - \frac{B^2(bc - ad)g^2(a + bx) \log(a + bx)}{85d^2} \\
&= -\frac{AbB(bc - ad)g^2 x}{85d^2} + \frac{aB^2(bc - ad)g^2 \log^2(a + bx)}{85d^2} - \frac{B^2(bc - ad)g^2(a + bx) \log(a + bx)}{85d^2}
\end{aligned}$$

**Mathematica [B]** time = 1.67134, size = 1514, normalized size = 2.82

result too large to display

Antiderivative was successfully verified.

[In] Integrate[((a\*g + b\*g\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2)/(c\*i + d\*i\*x),x]

[Out]  $(g^2*(-2*A^2*b*d*(b*c - 2*a*d)*x + A^2*b^2*d^2*x^2 + 2*A^2*(b*c - a*d)^2*Log[c + d*x] + 2*A*B*(-2*b^2*c^2 + 2*a*b*c*d - b^2*c*d*x + a*b*d^2*x + 2*b^2*c^2*Log[c/d + x] - b^2*c^2*Log[c/d + x]^2 - a^2*d^2*Log[a + b*x] - 2*b^2*c*d*x*Log[(e*(a + b*x))/(c + d*x)] + b^2*d^2*x^2*Log[(e*(a + b*x))/(c + d*x)] + b^2*c^2*Log[c + d*x] + 2*b^2*c^2*Log[c/d + x]*Log[c + d*x] + 2*b^2*c^2*Log[(e*(a + b*x))/(c + d*x])*Log[c + d*x] - 2*b*c*Log[a/b + x]*(a*d + b*c*Log[c + d*x] - b*c*Log[(b*(c + d*x))/(b*c - a*d)]) + 2*b^2*c^2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)] - 2*a^2*A*B*d^2*(Log[c/d + x]^2 + 2*(Log[a/b + x] - Log[c/d + x] - Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] - 2*(Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] + PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])) - 4*a*A*B*d*(-2*d*(a + b*x)*(-1 + Log[a/b + x]) + 2*b*(c + d*x)*(-1 + Log[c/d + x]) - b*c*Log[c/d + x]^2 + 2*b*(Log[a/b + x] - Log[c/d + x] - Log[(e*(a + b*x))/(c + d*x)])*(d*x - c*Log[c + d*x]) + 2*b*c*(Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] + PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])) + 4*a*B^2*d*(d*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)]^2 + b*c*Log[(e*(a + b*x))/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] - (b*c - a*d)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - 2*Log[(e*(a + b*x))/(c + d*x)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] + 2*b*c*(Log[(e*(a + b*x))/(c + d*x])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - PolyLog[3, (d*(a + b*x))/(b*(c + d*x))]) + B^2*(2*d*(-(b*c) + a*d)*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] - 2*a^2*d^2*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] + b^2*d^2*x^2*Log[(e*(a + b*x))/(c + d*x)]^2 - 2*b*c*d*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)]^2 + 2*(b*c - a*d)^2*Log[c + d*x] - 2*b^2*c^2*Log[(e*(a + b*x))/(c + d*x])*Log[(b*c - a*d)/(b*c + b*d*x)] - 2*b^2*c^2*Log[(e*(a + b*x))/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] + a^2*d^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)] + b^2*c^2*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] + 2*b*c*(b*c - a*d)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - 2*Log[(e*(a + b*x))/(c + d*x)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] - 4*b^2*c^2*(Log[(e*(a + b*x))/(c + d*x])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - PolyLog[3, (d*(a + b*x))/(b*(c + d*x))]) - 2*a^2*B^2*d^2*(Log[(e*(a + b*x))/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] + 2*Log[(e*(a + b*x))/(c + d*x])*PolyLog[2, (d*(a + b*x))/(b*(c$

+ d\*x))] - 2\*PolyLog[3, (d\*(a + b\*x))/(b\*(c + d\*x))])]/(2\*d^3\*i)

**Maple [F]** time = 2.291, size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^2}{dix + ci} \left( A + B \ln \left( \frac{e(bx + a)}{dx + c} \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^2\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i), x)

[Out] int((b\*g\*x+a\*g)^2\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i), x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$2 A^2 abg^2 \left( \frac{x}{di} - \frac{c \log(dx + c)}{d^2 i} \right) + \frac{1}{2} A^2 b^2 g^2 \left( \frac{2c^2 \log(dx + c)}{d^3 i} + \frac{dx^2 - 2cx}{d^2 i} \right) + \frac{A^2 a^2 g^2 \log(dix + ci)}{di} + \frac{2(b^2 c^2 g^2 - 2abcd)}{d^2 i^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i), x, algorith="maxima")

[Out] 2\*A^2\*a\*b\*g^2\*(x/(d\*i) - c\*log(d\*x + c)/(d^2\*i)) + 1/2\*A^2\*b^2\*g^2\*(2\*c^2\*log(d\*x + c)/(d^3\*i) + (d\*x^2 - 2\*c\*x)/(d^2\*i)) + A^2\*a^2\*g^2\*log(d\*i\*x + c\*i)/(d\*i) + 1/6\*(2\*(b^2\*c^2\*g^2 - 2\*a\*b\*c\*d\*g^2 + a^2\*d^2\*g^2)\*B^2\*log(d\*x + c)^3 + 3\*(B^2\*b^2\*d^2\*g^2\*x^2 - 2\*(b^2\*c\*d\*g^2 - 2\*a\*b\*d^2\*g^2)\*B^2\*x)\*log(d\*x + c)^2)/(d^3\*i) - integrate(-(B^2\*a^2\*d\*g^2\*log(e)^2 + 2\*A\*B\*a^2\*d\*g^2\*log(e) + (B^2\*b^2\*d\*g^2\*log(e)^2 + 2\*A\*B\*b^2\*d\*g^2\*log(e))\*x^2 + (B^2\*b^2\*d\*g^2\*x^2 + 2\*B^2\*a\*b\*d\*g^2\*x + B^2\*a^2\*d\*g^2)\*log(b\*x + a)^2 + 2\*(B^2\*a\*b\*d\*g^2\*log(e)^2 + 2\*A\*B\*a\*b\*d\*g^2\*log(e))\*x + 2\*(B^2\*a^2\*d\*g^2\*log(e) + A\*B\*a^2\*d\*g^2 + (B^2\*b^2\*d\*g^2\*log(e) + A\*B\*b^2\*d\*g^2))\*x^2 + 2\*(B^2\*a\*b\*d\*g^2\*log(e) + A\*B\*a\*b\*d\*g^2)\*x)\*log(b\*x + a) - (2\*B^2\*a^2\*d\*g^2\*log(e) + 2\*A\*B\*a^2\*d\*g^2 + (2\*A\*B\*b^2\*d\*g^2 + (2\*g^2\*log(e) + g^2)\*B^2\*b^2\*d)\*x^2 + 2\*(2\*A\*B\*a\*b\*d\*g^2 - (b^2\*c\*g^2 - 2\*(g^2\*log(e) + g^2)\*a\*b\*d)\*B^2)\*x + 2\*(B^2\*b^2\*d\*g^2\*x^2 + 2\*B^2\*a\*b\*d\*g^2\*x + B^2\*a^2\*d\*g^2)\*log(b\*x + a))\*log(d\*x + c))/(d^2\*i\*x + c\*d\*i), x)

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{A^2 b^2 g^2 x^2 + 2 A^2 a b g^2 x + A^2 a^2 g^2 + (B^2 b^2 g^2 x^2 + 2 B^2 a b g^2 x + B^2 a^2 g^2) \log\left(\frac{bex+ae}{dx+c}\right)^2 + 2 (ABb^2 g^2 x^2 + 2 ABabg^2 x + ABa^2 g^2)}{dix + ci} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x, algorithm="fricas")
```

```
[Out] integral((A^2*b^2*g^2*x^2 + 2*A^2*a*b*g^2*x + A^2*a^2*g^2 + (B^2*b^2*g^2*x^2 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*b^2*g^2*x^2 + 2*A*B*a*b*g^2*x + A*B*a^2*g^2)*log((b*e*x + a*e)/(d*x + c)))/(d*i*x + c*i), x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^2 \left( B \log\left(\frac{bx+a}{dx+c}\right) + A \right)^2}{dix + ci} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(d*i*x + c*i), x)
```

$$3.86 \quad \int \frac{(ag+bgx)\left(A+B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ci+dix} dx$$

**Optimal.** Leaf size=283

$$\frac{2Bg(bc-ad)\text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{d^2i} + \frac{2B^2g(bc-ad)\text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)}{d^2i} - \frac{2B^2g(bc-ad)\text{PolyLog}\left(3, \frac{d(a+bx)}{b(c+dx)}\right)}{d^2i}$$

```
[Out] (2*B*(b*c - a*d)*g*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^2*i) + (g*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(d*i) + ((b*c - a*d)*g*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(d^2*i) + (2*B^2*(b*c - a*d)*g*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^2*i) + (2*B*(b*c - a*d)*g*(A + B*Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^2*i) - (2*B^2*(b*c - a*d)*g*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/(d^2*i)
```

**Rubi [B]** time = 4.13182, antiderivative size = 1072, normalized size of antiderivative = 3.79, number of steps used = 68, number of rules used = 24, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.6$ , Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2500, 2433, 2375, 2317, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

$$-\frac{B^2(bc-ad)g \log^3(c+dx)}{3d^2i} + \frac{B^2(bc-ad)g \log(a+bx) \log^2(c+dx)}{d^2i} - \frac{B^2(bc-ad)g \log\left(\frac{e(a+bx)}{c+dx}\right) \log^2(c+dx)}{d^2i} - \frac{AB(bc-ad)g \log^2(c+dx)}{d^2i}$$

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d*i*x),x]
```

```
[Out] -((a*B^2*g*Log[a + b*x]^2)/(d*i)) + (B^2*(b*c - a*d)*g*Log[a + b*x]*Log[(c + d*x)^(-1)]^2)/(d^2*i) - (B^2*(b*c - a*d)*g*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^(-1)]^2)/(d^2*i) + (2*a*B*g*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d*i) + (b*g*x*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(d*i) + (B^2*(b*c - a*d)*g*Log[a + b*x]^2*Log[c + d*x])/(d^2*i) + (2*b*B^2*c*g*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d^2*i) + (2*A*B*(b*c - a*d)*g*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d^2*i) + (2*B^2*(b*c - a*d)*g*Log[a + b*x]*Log[(c + d*x)^(-1)]*Log[c + d*x])/(d^2*i) - (2*B^2*(b*c - a*d)*g*Log[-((d*(a + b*x))/(b*c - a*d))]*(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(d^2*i) - (2*b*B*c*g*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(d^2*i) - ((b*c - a*d)*g*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2*Log[c + d*x])/(d^2*i) - (b*B^2*c*g*Log[a + b*x]^2*Log[c + d*x])/(d^2*i)
```

$$\begin{aligned}
& c * g * \text{Log}[c + d * x]^2 / (d^2 * i) - (A * B * (b * c - a * d) * g * \text{Log}[c + d * x]^2 / (d^2 * i) + \\
& (B^2 * (b * c - a * d) * g * \text{Log}[a + b * x] * \text{Log}[c + d * x]^2 / (d^2 * i) - (B^2 * (b * c - a * d) * g \\
& * \text{Log}[(e * (a + b * x)) / (c + d * x)] * \text{Log}[c + d * x]^2 / (d^2 * i) - (B^2 * (b * c - a * d) * g \\
& * \text{Log}[c + d * x]^3 / (3 * d^2 * i) + (2 * a * B^2 * g * \text{Log}[a + b * x] * \text{Log}[(b * (c + d * x)) / (b * c \\
& - a * d)]) / (d * i) - (B^2 * (b * c - a * d) * g * \text{Log}[a + b * x]^2 * \text{Log}[(b * (c + d * x)) / (b * c \\
& - a * d)]) / (d^2 * i) + (2 * a * B^2 * g * \text{PolyLog}[2, -((d * (a + b * x)) / (b * c - a * d))]) / (d * \\
& i) - (2 * B^2 * (b * c - a * d) * g * \text{Log}[a + b * x] * \text{PolyLog}[2, -((d * (a + b * x)) / (b * c - a * \\
& d))]) / (d^2 * i) + (2 * b * B^2 * c * g * \text{PolyLog}[2, (b * (c + d * x)) / (b * c - a * d)]) / (d^2 * i) \\
& + (2 * A * B * (b * c - a * d) * g * \text{PolyLog}[2, (b * (c + d * x)) / (b * c - a * d)]) / (d^2 * i) + (2 \\
& * B^2 * (b * c - a * d) * g * \text{Log}[(c + d * x)^{-1}] * \text{PolyLog}[2, (b * (c + d * x)) / (b * c - a * d) \\
& ]) / (d^2 * i) - (2 * B^2 * (b * c - a * d) * g * (\text{Log}[a + b * x] + \text{Log}[(c + d * x)^{-1}] - \text{Log} \\
& [(e * (a + b * x)) / (c + d * x)]) * \text{PolyLog}[2, (b * (c + d * x)) / (b * c - a * d)]) / (d^2 * i) + \\
& (2 * B^2 * (b * c - a * d) * g * \text{PolyLog}[3, -((d * (a + b * x)) / (b * c - a * d))]) / (d^2 * i) + ( \\
& 2 * B^2 * (b * c - a * d) * g * \text{PolyLog}[3, (b * (c + d * x)) / (b * c - a * d)]) / (d^2 * i)
\end{aligned}$$

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]
] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

```

### Rule 2523

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] := Simp[x*(a +
b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

```

### Rule 12

```

Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]

```

### Rule 2524

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

```

### Rule 2418

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n]^p, RFx, x]},

```

Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]

### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.)\*(x\_))^(q\_.), x\_Symbol] :> Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] :> Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :> Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :> Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] :> -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rule 6688

Int[u\_, x\_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifyIntegrandQ[v, u, x]]

### Rule 6742

Int[u\_, x\_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]

Rule 2500

```
Int[(Log[(e_.)*((f_.)*(a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] := Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] := Dist[1/e, Subst[Int[(k*x)/d]^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
e*i - d*j)/e + (j*x)/e]^m), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_.) + (f_.)*(x_))^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_))^(n
_.)]*(b_.))^(p_.)/(x_), x_Symbol] := Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_))^(n_.)]*(b_.))^(p_.)/((d_.) + (e_.)*(x_)), x_Symb
ol] := Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_.) + (f_.)*(x_))^(m_.))]*((a_.) + Log[(c_.)*(x_))^(n_.)]*(b
_.))^(p_.)/(x_), x_Symbol] := -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
```



```

ymbol] := Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]

```

### Rule 2440

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :=
Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n)]*(f +
g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]

```

### Rule 2434

```

Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] := Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n)]*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m))]/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]

```

### Rule 2499

```

Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*(s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/(j_.
) + (k_.)*(x_)), x_Symbol] := Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q]^r)/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]

```

### Rule 2396

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.)
*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]

```

### Rule 2302

```

Int[((a_.) + Log[(c_.)*(x_))^(n_.)]*(b_.))^(p_)/(x_), x_Symbol] := Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
x]

```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{(ag + bgx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{86c + 86dx} dx &= \int \left( \frac{bg \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{86d} + \frac{(-bc + ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{86d(c + dx)} \right) dx \\
&= \frac{(bg) \int \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{86d} - \frac{((bc - ad)g) \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{c+dx} dx}{86d} \\
&= \frac{bgx \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{86d} - \frac{(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 \log(c + dx)}{86d^2} \\
&= \frac{bgx \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{86d} - \frac{(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 \log(c + dx)}{86d^2} \\
&= \frac{bgx \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{86d} - \frac{(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 \log(c + dx)}{86d^2} \\
&= \frac{bgx \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{86d} - \frac{(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 \log(c + dx)}{86d^2} + \\
&= \frac{aBg \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{43d} + \frac{bgx \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{86d} - \frac{bBcg \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{43d} \\
&= \frac{aBg \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{43d} + \frac{bgx \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{86d} - \frac{bBcg \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{43d} \\
&= \frac{aBg \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{43d} + \frac{bgx \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{86d} - \frac{bBcg \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{43d} \\
&= \frac{aBg \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{43d} + \frac{bgx \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{86d} + \frac{bB^2cg}{43d} \\
&= -\frac{aB^2g \log^2(a + bx)}{86d} + \frac{aBg \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{43d} + \frac{bgx \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{86d} \\
&= -\frac{aB^2g \log^2(a + bx)}{86d} + \frac{aBg \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{43d} + \frac{bgx \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{86d}
\end{aligned}$$

**Mathematica [B]** time = 0.749911, size = 646, normalized size = 2.28

$$g \left( aABd \left( -2 \left( \text{PolyLog} \left( 2, \frac{d(a+bx)}{ad-bc} \right) + \log \left( \frac{a}{b} + x \right) \log \left( \frac{b(c+dx)}{bc-ad} \right) \right) + 2 \log(c+dx) \left( -\log \left( \frac{e(a+bx)}{c+dx} \right) + \log \left( \frac{a}{b} + x \right) - \log \left( \frac{c}{d} + \right. \right. \right.$$

Antiderivative was successfully verified.

[In] Integrate[((a\*g + b\*g\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))^2)/(c\*i + d\*i\*x), x]

[Out] -((g\*(-(A^2\*b\*d\*x) + A^2\*(b\*c - a\*d)\*Log[c + d\*x] + a\*A\*B\*d\*(Log[c/d + x]^2 + 2\*(Log[a/b + x] - Log[c/d + x] - Log[(e\*(a + b\*x))/(c + d\*x]))\*Log[c + d\*x] - 2\*(Log[a/b + x]\*Log[(b\*(c + d\*x))/(b\*c - a\*d)] + PolyLog[2, (d\*(a + b\*x))/(-b\*c + a\*d)])) + A\*B\*(-2\*d\*(a + b\*x)\*(-1 + Log[a/b + x]) + 2\*b\*(c + d\*x)\*(-1 + Log[c/d + x]) - b\*c\*Log[c/d + x]^2 + 2\*b\*(Log[a/b + x] - Log[c/d + x] - Log[(e\*(a + b\*x))/(c + d\*x]))\*(d\*x - c\*Log[c + d\*x]) + 2\*b\*c\*(Log[a/b + x]\*Log[(b\*(c + d\*x))/(b\*c - a\*d)] + PolyLog[2, (d\*(a + b\*x))/(-b\*c + a\*d)])) - B^2\*(d\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x)]^2 + b\*c\*Log[(e\*(a + b\*x))/(c + d\*x)]^2\*Log[(b\*c - a\*d)/(b\*c + b\*d\*x)] - (b\*c - a\*d)\*(Log[(b\*c - a\*d)/(b\*c + b\*d\*x)]\*(2\*Log[(d\*(a + b\*x))/(-b\*c + a\*d)] - 2\*Log[(e\*(a + b\*x))/(c + d\*x)] + Log[(b\*c - a\*d)/(b\*c + b\*d\*x)]) - 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)] + 2\*b\*c\*(Log[(e\*(a + b\*x))/(c + d\*x)]\*PolyLog[2, (d\*(a + b\*x))/(b\*(c + d\*x))] - PolyLog[3, (d\*(a + b\*x))/(b\*(c + d\*x))])) + a\*B^2\*d\*(Log[(e\*(a + b\*x))/(c + d\*x)]^2\*Log[(b\*c - a\*d)/(b\*c + b\*d\*x)] + 2\*Log[(e\*(a + b\*x))/(c + d\*x)]\*PolyLog[2, (d\*(a + b\*x))/(b\*(c + d\*x))] - 2\*PolyLog[3, (d\*(a + b\*x))/(b\*(c + d\*x))]))/(d^2\*i)

**Maple [F]** time = 2.141, size = 0, normalized size = 0.

$$\int \frac{bgx + ag}{dix + ci} \left( A + B \ln \left( \frac{e(bx + a)}{dx + c} \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i), x)

[Out] int((b\*g\*x+a\*g)\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i), x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$A^2bg\left(\frac{x}{di} - \frac{c \log(dx+c)}{d^2i}\right) + \frac{A^2ag \log(dix+ci)}{di} + \frac{3B^2bdgx \log(dx+c)^2 - (bcg - adg)B^2 \log(dx+c)^3}{3d^2i} - \int -\frac{B^2ag \log(dx+c)}{d^2i} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i),x, algorithm="maxima")

[Out] A^2\*b\*g\*(x/(d\*i) - c\*log(d\*x + c)/(d^2\*i)) + A^2\*a\*g\*log(d\*i\*x + c\*i)/(d\*i) + 1/3\*(3\*B^2\*b\*d\*g\*x\*log(d\*x + c)^2 - (b\*c\*g - a\*d\*g)\*B^2\*log(d\*x + c)^3)/(d^2\*i) - integrate(-(B^2\*a\*g\*log(e)^2 + 2\*A\*B\*a\*g\*log(e) + (B^2\*b\*g\*x + B^2\*a\*g)\*log(b\*x + a)^2 + (B^2\*b\*g\*log(e)^2 + 2\*A\*B\*b\*g\*log(e))\*x + 2\*(B^2\*a\*g\*log(e) + A\*B\*a\*g + (B^2\*b\*g\*log(e) + A\*B\*b\*g)\*x)\*log(b\*x + a) - 2\*(B^2\*a\*g\*log(e) + A\*B\*a\*g + ((g\*log(e) + g)\*B^2\*b + A\*B\*b\*g)\*x + (B^2\*b\*g\*x + B^2\*a\*g)\*log(b\*x + a))\*log(d\*x + c))/(d\*i\*x + c\*i), x)

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^2bgx + A^2ag + (B^2bgx + B^2ag) \log\left(\frac{bex+ae}{dx+c}\right)^2 + 2(ABbgx + ABag) \log\left(\frac{bex+ae}{dx+c}\right)}{dix + ci}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i),x, algorithm="fricas")

[Out] integral((A^2\*b\*g\*x + A^2\*a\*g + (B^2\*b\*g\*x + B^2\*a\*g)\*log((b\*e\*x + a\*e)/(d\*x + c))^2 + 2\*(A\*B\*b\*g\*x + A\*B\*a\*g)\*log((b\*e\*x + a\*e)/(d\*x + c)))/(d\*i\*x + c\*i), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag) \left( B \log \left( \frac{(bx+a)e}{dx+c} \right) + A \right)^2}{dix + ci} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i),x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(d*i*x + c*i), x)
```

$$3.87 \quad \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ci+dx} dx$$

**Optimal.** Leaf size=127

$$\frac{2B \text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{di} + \frac{2B^2 \text{PolyLog}\left(3, \frac{d(a+bx)}{b(c+dx)}\right)}{di} - \frac{\log\left(\frac{bc-ad}{b(c+dx)}\right) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)^2}{di}$$

[Out]  $-\left(\frac{\text{Log}[b*c - a*d]}{b*(c + d*x)}\right)*(A + B*\text{Log}[\frac{e*(a + b*x)}{c + d*x}])^2/(d*i) - (2*B*(A + B*\text{Log}[\frac{e*(a + b*x)}{c + d*x}])* \text{PolyLog}[2, (d*(a + b*x))/(b*(c + d*x))])/(d*i) + (2*B^2*\text{PolyLog}[3, (d*(a + b*x))/(b*(c + d*x))])/(d*i)$

**Rubi [B]** time = 3.26832, antiderivative size = 721, normalized size of antiderivative = 5.68, number of steps used = 46, number of rules used = 23, integrand size = 32,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.719$ , Rules used = {2524, 12, 2528, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2499, 2396, 2433, 2374, 6589, 2302, 30, 2500, 2375, 2317, 2440, 2434}

$$\frac{2AB \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{di} + \frac{2B^2 \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right) \left(-\log\left(\frac{e(a+bx)}{c+dx}\right) + \log(a+bx) + \log\left(\frac{1}{c+dx}\right)\right)}{di} - \frac{2B^2 \text{PolyLog}\left(3, \frac{b(c+dx)}{bc-ad}\right)}{di}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[(A + B*\text{Log}[\frac{e*(a + b*x)}{c + d*x}])^2/(c*i + d*i*x), x]$

[Out]  $-\left(B^2*\text{Log}[a + b*x]*\text{Log}[(c + d*x)^{-1}]^2\right)/(d*i) + (B^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[(c + d*x)^{-1}]^2)/(d*i) + (B^2*\text{Log}[a + b*x]^2*\text{Log}[(b*(c + d*x))/(b*c - a*d)])/(d*i) - (B^2*\text{Log}[a + b*x]^2*\text{Log}[i*(c + d*x)])/(d*i) - (2*B^2*\text{Log}[a + b*x]*\text{Log}[(c + d*x)^{-1}]*\text{Log}[i*(c + d*x)])/(d*i) + (A*B*\text{Log}[i*(c + d*x)]^2)/(d*i) - (B^2*\text{Log}[a + b*x]*\text{Log}[i*(c + d*x)]^2)/(d*i) + (B^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[i*(c + d*x)]^2)/(d*i) + (B^2*\text{Log}[i*(c + d*x)]^3)/(3*d*i) - (2*A*B*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c*i + d*i*x])/(d*i) + (2*B^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*(\text{Log}[a + b*x] + \text{Log}[(c + d*x)^{-1}] - \text{Log}[\frac{e*(a + b*x)}{c + d*x}])* \text{Log}[c*i + d*i*x])/(d*i) + ((A + B*\text{Log}[\frac{e*(a + b*x)}{c + d*x}])^2*\text{Log}[c*i + d*i*x])/(d*i) - (B^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c*i + d*i*x]^2)/(d*i) + (B^2*\text{Log}[\frac{e*(a + b*x)}{c + d*x}]*\text{Log}[c*i + d*i*x]^2)/(d*i) + (2*B^2*\text{Log}[a + b*x]*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))])/(d*i) - (2*A*B*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])/(d*i) - (2*B^2*\text{Log}[(c + d*x)^{-1}]*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])/(d*i) + (2*B^2*(\text{Log}[a + b*x] + \text{Log}[(c + d*x)^{-1}] - \text{Log}[\frac{e*(a + b*x)}{c + d*x}]))/(d*i)$

$$\frac{+ b*x)}{(c + d*x))} * \text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)] / (d*i) - (2*B^2 * \text{PolyLog}[3, -((d*(a + b*x))/(b*c - a*d))]) / (d*i) - (2*B^2 * \text{PolyLog}[3, (b*(c + d*x))/(b*c - a*d)] / (d*i)$$

### Rule 2524

$$\text{Int}[(a_.) + \text{Log}[(c_.)*(Rfx_)^{(p_.)}] * (b_.)^{(n_.)} / ((d_.) + (e_.)*(x_.)), x\_Symbol] \rightarrow \text{Simp}[(\text{Log}[d + e*x] * (a + b * \text{Log}[c * Rfx^p])^n) / e, x] - \text{Dist}[(b * n * p) / e, \text{Int}[(\text{Log}[d + e*x] * (a + b * \text{Log}[c * Rfx^p])^{(n - 1)}) * D[Rfx, x]] / Rfx, x], x] /;$$

$\text{FreeQ}\{a, b, c, d, e, p\}, x\} \ \&\& \ \text{RationalFunctionQ}[Rfx, x] \ \&\& \ \text{IGtQ}[n, 0]$

### Rule 12

$$\text{Int}[(a_)*(u_), x\_Symbol] \rightarrow \text{Dist}[a, \text{Int}[u, x], x] /;$$

$\text{FreeQ}[a, x] \ \&\& \ !\text{MatchQ}[u, (b_)*(v_)] /;$ 

$\text{FreeQ}[b, x]$

### Rule 2528

$$\text{Int}[(a_.) + \text{Log}[(c_.)*(Rfx_)^{(p_.)}] * (b_.)^{(n_.)} * (RGx_), x\_Symbol] \rightarrow \text{With}[\{u = \text{ExpandIntegrand}[(a + b * \text{Log}[c * Rfx^p])^n, RGx, x]\}, \text{Int}[u, x] /;$$

$\text{SumQ}[u]] /;$ 

$\text{FreeQ}\{a, b, c, p\}, x\} \ \&\& \ \text{RationalFunctionQ}[Rfx, x] \ \&\& \ \text{RationalFunctionQ}[RGx, x] \ \&\& \ \text{IGtQ}[n, 0]$

### Rule 2418

$$\text{Int}[(a_.) + \text{Log}[(c_.)*((d_) + (e_.)*(x_.))^{(n_.)}] * (b_.)^{(p_.)} * (Rfx_), x\_Symbol] \rightarrow \text{With}[\{u = \text{ExpandIntegrand}[(a + b * \text{Log}[c * (d + e*x)^n])^p, Rfx, x]\}, \text{Int}[u, x] /;$$

$\text{SumQ}[u]] /;$ 

$\text{FreeQ}\{a, b, c, d, e, n\}, x\} \ \&\& \ \text{RationalFunctionQ}[Rfx, x] \ \&\& \ \text{IntegerQ}[p]$

### Rule 2390

$$\text{Int}[(a_.) + \text{Log}[(c_.)*((d_) + (e_.)*(x_.))^{(n_.)}] * (b_.)^{(p_.)} * ((f_) + (g_.)*(x_.))^{(q_.)}, x\_Symbol] \rightarrow \text{Dist}[1/e, \text{Subst}[\text{Int}[(f*x)/d)^q * (a + b * \text{Log}[c * x^n])^p, x], x, d + e*x], x] /;$$

$\text{FreeQ}\{a, b, c, d, e, f, g, n, p, q\}, x\} \ \&\& \ \text{EqQ}[e*f - d*g, 0]$

### Rule 2301

$$\text{Int}[(a_.) + \text{Log}[(c_.)*(x_.)^{(n_.)}] * (b_.) / (x_), x\_Symbol] \rightarrow \text{Simp}[(a + b * \text{Log}[c * x^n])^2 / (2 * b * n), x] /;$$

$\text{FreeQ}\{a, b, c, n\}, x]$

### Rule 2394



```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rule 6688

```
Int[u_, x_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifyIntegrandQ[v, u, x]]
```

### Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]
```

### Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.))^r]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^m)/((j_.) + (k_.)*(x_)), x_Symbol] := Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r)/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dist[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

### Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^p)/((f_.) + (g_.)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
```

, e, f, g, n, p}, x] && NeQ[e\*f - d\*g, 0] && IGtQ[p, 1]

### Rule 2433

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.) + Log[(h\_.)\*((i\_.) + (j\_.)\*(x\_))^(m\_.)]\*(g\_.)\*((k\_.) + (l\_.)\*(x\_))^(r\_.), x\_Symbol] :> Dist[1/e, Subst[Int[((k\*x)/d)^r\*(a + b\*Log[c\*x^n])^p\*(f + g\*Log[h\*(e\*i - d\*j)/e + (j\*x)/e]^m), x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e\*k - d\*1, 0]

### Rule 2374

Int[(Log[(d\_.)\*((e\_) + (f\_.)\*(x\_)^(m\_.))]\*((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.))/(x\_), x\_Symbol] :> -Simp[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^p)/m, x] + Dist[(b\*n\*p)/m, Int[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0] && EqQ[d\*e, 1]

### Rule 6589

Int[PolyLog[n\_, (c\_.)\*((a\_.) + (b\_.)\*(x\_)^(p\_.))]/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] :> Simp[PolyLog[n + 1, c\*(a + b\*x)^p]/(e\*p), x] /; FreeQ[{a, b, c, d, e, n, p}, x] && EqQ[b\*d, a\*e]

### Rule 2302

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/(x\_), x\_Symbol] :> Dist[1/(b\*n), Subst[Int[x^p, x], x, a + b\*Log[c\*x^n]], x] /; FreeQ[{a, b, c, n, p}, x]

### Rule 30

Int[(x\_)^(m\_.), x\_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && NeQ[m, -1]

### Rule 2500

Int[(Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_)^(p\_.))\*((c\_.) + (d\_.)\*(x\_)^(q\_.))^(r\_.)]\*((s\_.) + Log[(i\_.)\*((g\_.) + (h\_.)\*(x\_)^(n\_.)]\*(t\_.)))/((j\_.) + (k\_.)\*(x\_)), x\_Symbol] :> Dist[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q)^r] - Log[(a + b\*x)^(p\*r)] - Log[(c + d\*x)^(q\*r)], Int[(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x], x] + (Int[(Log[(a + b\*x)^(p\*r)]\*(s + t\*Log[i\*(g + h\*x)^n])]/(j + k\*x), x] + Int[(Log[(c + d\*x)^(q\*r)]\*(s + t\*Log[i\*(g + h\*x)^n])]/(j + k\*x), x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ

$[b*c - a*d, 0]$

### Rule 2375

Int[(Log[(d\_.)\*((e\_.) + (f\_.)\*(x\_)^(m\_.))^(r\_.)]\*(a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)]/(x\_), x\_Symbol] := Simp[(Log[d\*(e + f\*x^m)^r]\*(a + b\*Log[c\*x^n])^(p + 1))/(b\*n\*(p + 1)), x] - Dist[(f\*m\*r)/(b\*n\*(p + 1)), Int[(x^(m - 1)\*(a + b\*Log[c\*x^n])^(p + 1))/(e + f\*x^m), x], x] /; FreeQ[{a, b, c, d, e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d\*e, 1]

### Rule 2317

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)]/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^p)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

### Rule 2440

Int[((a\_.) + Log[(c\_.)\*((d\_.) + (e\_.)\*(x\_)^(n\_.))^(r\_.)]\*(b\_.))\*((f\_.) + Log[(h\_.)\*((i\_.) + (j\_.)\*(x\_)^(m\_.)]\*(g\_.))\*((k\_.) + (l\_.)\*(x\_)^(r\_.)), x\_Symbol] := Dist[1/l, Subst[Int[x^r\*(a + b\*Log[c\*(-((e\*k - d\*1)/l) + (e\*x)/l)^n])\*(f + g\*Log[h\*(-((j\*k - i\*1)/l) + (j\*x)/l)^m]), x], x, k + l\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]

### Rule 2434

Int[((a\_.) + Log[(c\_.)\*((d\_.) + (e\_.)\*(x\_)^(n\_.))^(r\_.)]\*(b\_.))\*((f\_.) + Log[(h\_.)\*((i\_.) + (j\_.)\*(x\_)^(m\_.)]\*(g\_.)))/(x\_), x\_Symbol] := Simp[Log[x]\*(a + b\*Log[c\*(d + e\*x)^n])\*(f + g\*Log[h\*(i + j\*x)^m]), x] + (-Dist[e\*g\*m, Int[(Log[x]\*(a + b\*Log[c\*(d + e\*x)^n])]/(d + e\*x), x], x] - Dist[b\*j\*n, Int[(Log[x]\*(f + g\*Log[h\*(i + j\*x)^m])]/(i + j\*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, m, n}, x] && EqQ[e\*i - d\*j, 0]

### Rubi steps

$$\begin{aligned}
\int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{87c + 87dx} dx &= \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 \log(87c + 87dx)}{87d} - \frac{(2B) \int \frac{(c+dx)\left(-\frac{de(a+bx)}{(c+dx)^2} + \frac{be}{c+dx}\right)\left(A+B \log\left(\frac{e(a+bx)}{c+dx}\right)\right) \log(87c+87dx)}{e(a+bx)} dx}{87d} \\
&= \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 \log(87c + 87dx)}{87d} - \frac{(2B) \int \frac{(c+dx)\left(-\frac{de(a+bx)}{(c+dx)^2} + \frac{be}{c+dx}\right)\left(A+B \log\left(\frac{e(a+bx)}{c+dx}\right)\right) \log(87c+87dx)}{a+bx} dx}{87de} \\
&= \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 \log(87c + 87dx)}{87d} - \frac{(2B) \int \frac{(bc-ad)e\left(A+B \log\left(\frac{e(a+bx)}{c+dx}\right)\right) \log(87c+87dx)}{(a+bx)(c+dx)} dx}{87de} \\
&= \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 \log(87c + 87dx)}{87d} - \frac{(2B(bc - ad)) \int \frac{\left(A+B \log\left(\frac{e(a+bx)}{c+dx}\right)\right) \log(87c+87dx)}{(a+bx)(c+dx)} dx}{87d} \\
&= \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 \log(87c + 87dx)}{87d} - \frac{(2B(bc - ad)) \int \frac{d\left(-A-B \log\left(\frac{e(a+bx)}{c+dx}\right)\right) \log(87c+87dx)}{(bc-ad)(c+dx)} dx}{87d} \\
&= \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 \log(87c + 87dx)}{87d} - \frac{1}{87}(2B) \int \frac{\left(-A - B \log\left(\frac{e(a+bx)}{c+dx}\right)\right) \log(87c + 87dx)}{c + dx} dx \\
&= \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 \log(87c + 87dx)}{87d} - \frac{1}{87}(2B) \int \left( \frac{A \log(87c + 87dx)}{-c - dx} + \frac{B \log\left(\frac{e(a+bx)}{c+dx}\right)}{-c - dx} \right) dx \\
&= \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 \log(87c + 87dx)}{87d} - \frac{1}{87}(2AB) \int \frac{\log(87c + 87dx)}{-c - dx} dx - \frac{1}{87}(2B^2) \int \frac{\log\left(\frac{e(a+bx)}{c+dx}\right)}{-c - dx} dx \\
&= -\frac{2AB \log\left(-\frac{d(a+bx)}{bc-ad}\right) \log(87c + 87dx)}{87d} + \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 \log(87c + 87dx)}{87d} + \frac{B^2 \log\left(\frac{1}{c+dx}\right) \log(87(c+dx))}{87d} \\
&= -\frac{2AB \log\left(-\frac{d(a+bx)}{bc-ad}\right) \log(87c + 87dx)}{87d} + \frac{2B^2 \log\left(-\frac{d(a+bx)}{bc-ad}\right) \left(\log(a + bx) + \log\left(\frac{1}{c+dx}\right) - \log(87(c+dx))\right)}{87d} \\
&= -\frac{B^2 \log^2(a + bx) \log(87(c + dx))}{87d} - \frac{2B^2 \log(a + bx) \log\left(\frac{1}{c+dx}\right) \log(87(c + dx))}{87d} + \frac{AB \log^2\left(\frac{1}{c+dx}\right) \log(87(c + dx))}{87d} \\
&= -\frac{B^2 \log^2(a + bx) \log(87(c + dx))}{87d} - \frac{2B^2 \log(a + bx) \log\left(\frac{1}{c+dx}\right) \log(87(c + dx))}{87d} + \frac{AB \log^2\left(\frac{1}{c+dx}\right) \log(87(c + dx))}{87d} \\
&= -\frac{B^2 \log(a + bx) \log^2\left(\frac{1}{c+dx}\right)}{87d} - \frac{B^2 \log^2(a + bx) \log(87(c + dx))}{87d} - \frac{2B^2 \log(a + bx) \log\left(\frac{1}{c+dx}\right) \log(87(c + dx))}{87d}
\end{aligned}$$

**Mathematica [A]** time = 0.252336, size = 251, normalized size = 1.98

$$2AB \operatorname{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) - 2B^2 \operatorname{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right) \log\left(\frac{e(a+bx)}{c+dx}\right) + 2B^2 \operatorname{PolyLog}\left(3, \frac{d(a+bx)}{b(c+dx)}\right) + 2AB \log(c+dx) \log\left(\frac{e(a+bx)}{c+dx}\right)$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))^2/(c\*i + d\*i\*x), x]

[Out]  $(-(A*B*\operatorname{Log}[c/d + x]^2) + A^2*\operatorname{Log}[c + d*x] - 2*A*B*\operatorname{Log}[a/b + x]*\operatorname{Log}[c + d*x] + 2*A*B*\operatorname{Log}[c/d + x]*\operatorname{Log}[c + d*x] + 2*A*B*\operatorname{Log}[(e*(a + b*x))/(c + d*x)]*\operatorname{Log}[c + d*x] + 2*A*B*\operatorname{Log}[a/b + x]*\operatorname{Log}[(b*(c + d*x))/(b*c - a*d)] - B^2*\operatorname{Log}[(e*(a + b*x))/(c + d*x)]^2*\operatorname{Log}[(b*c - a*d)/(b*c + b*d*x)] + 2*A*B*\operatorname{PolyLog}[2, (d*(a + b*x))/(-b*c) + a*d] - 2*B^2*\operatorname{Log}[(e*(a + b*x))/(c + d*x)]*\operatorname{PolyLog}[2, (d*(a + b*x))/(b*(c + d*x))] + 2*B^2*\operatorname{PolyLog}[3, (d*(a + b*x))/(b*(c + d*x))])/(d*i)$

**Maple [B]** time = 0.069, size = 888, normalized size = 7.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i), x)

[Out]  $-1/i/(a*d-b*c)*A^2*\ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a+1/d/i/(a*d-b*c)*A^2*\ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*b*c-1/i/(a*d-b*c)*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*\ln(1-1/b/e*d*(b*e/d+(a*d-b*c)*e/d/(d*x+c)))*a+1/d/i/(a*d-b*c)*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*\ln(1-1/b/e*d*(b*e/d+(a*d-b*c)*e/d/(d*x+c)))*b*c-2/i/(a*d-b*c)*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*\operatorname{polylog}(2, 1/b/e*d*(b*e/d+(a*d-b*c)*e/d/(d*x+c)))*a+2/d/i/(a*d-b*c)*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*\operatorname{polylog}(2, 1/b/e*d*(b*e/d+(a*d-b*c)*e/d/(d*x+c)))*b*c+2/i/(a*d-b*c)*B^2*\operatorname{polylog}(3, 1/b/e*d*(b*e/d+(a*d-b*c)*e/d/(d*x+c)))*a-2/d/i/(a*d-b*c)*B^2*\operatorname{polylog}(3, 1/b/e*d*(b*e/d+(a*d-b*c)*e/d/(d*x+c)))*b*c-2/i/(a*d-b*c)*A*B*\operatorname{dilog}(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a+2/d/i/(a*d-b*c)*A*B*\operatorname{dilog}(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*b*c-2/i/(a*d-b*c)*A*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*\ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a+2/d/i/(a*d-b*c)*A*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*\ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*b*c$

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$\frac{B^2 \log(dx + c)^3}{3di} + \frac{A^2 \log(dix + ci)}{di} - \int -\frac{B^2 \log(bx + a)^2 + B^2 \log(e)^2 + 2AB \log(e) + 2(B^2 \log(e) + AB) \log(bx + a)}{dix + ci}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i),x, algorithm="maxima")

[Out] 1/3\*B^2\*log(d\*x + c)^3/(d\*i) + A^2\*log(d\*i\*x + c\*i)/(d\*i) - integrate(-(B^2\*log(b\*x + a)^2 + B^2\*log(e)^2 + 2\*A\*B\*log(e) + 2\*(B^2\*log(e) + A\*B)\*log(b\*x + a) - 2\*(B^2\*log(b\*x + a) + B^2\*log(e) + A\*B)\*log(d\*x + c))/(d\*i\*x + c\*i), x)

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B^2 \log\left(\frac{bex+ae}{dx+c}\right)^2 + 2AB \log\left(\frac{bex+ae}{dx+c}\right) + A^2}{dix + ci}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i),x, algorithm="fricas")

[Out] integral((B^2\*log((b\*e\*x + a\*e)/(d\*x + c))^2 + 2\*A\*B\*log((b\*e\*x + a\*e)/(d\*x + c)) + A^2)/(d\*i\*x + c\*i), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*(b\*x+a)/(d\*x+c)))\*\*2/(d\*i\*x+c\*i),x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left( B \log\left(\frac{(bx+a)e}{dx+c}\right) + A \right)^2}{dix + ci} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i),x, algorithm="giac")

[Out] integrate((B\*log((b\*x + a)\*e/(d\*x + c)) + A)^2/(d\*i\*x + c\*i), x)

$$3.88 \quad \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)(ci+dix)} dx$$

**Optimal.** Leaf size=44

$$\frac{\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)^3}{3Bgi(bc - ad)}$$

[Out] (A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^3/(3\*B\*(b\*c - a\*d)\*g\*i)

**Rubi [C]** time = 5.53107, antiderivative size = 1163, normalized size of antiderivative = 26.43, number of steps used = 61, number of rules used = 29, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.69$ , Rules used = {2528, 2524, 12, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

$$-\frac{B^2 \log^3(c+dx)}{3(bc-ad)gi} + \frac{B^2 \log(a+bx) \log^2(c+dx)}{(bc-ad)gi} - \frac{B^2 \log\left(\frac{e(a+bx)}{c+dx}\right) \log^2(c+dx)}{(bc-ad)gi} - \frac{AB \log^2(c+dx)}{(bc-ad)gi} + \frac{B^2 \log^2(a+bx) \log(c+dx)}{(bc-ad)gi}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2/((a\*g + b\*g\*x)\*(c\*i + d\*i\*x)),x]

[Out] -((A\*B\*Log[a + b\*x]^2)/((b\*c - a\*d)\*g\*i)) + (B^2\*Log[a + b\*x]\*Log[(c + d\*x)^(-1)]^2)/((b\*c - a\*d)\*g\*i) - (B^2\*Log[-((d\*(a + b\*x))/(b\*c - a\*d))]\*Log[(c + d\*x)^(-1)]^2)/((b\*c - a\*d)\*g\*i) - (B^2\*Log[-((b\*c - a\*d)/(d\*(a + b\*x))])\*Log[(e\*(a + b\*x))/(c + d\*x)]^2)/((b\*c - a\*d)\*g\*i) - (B^2\*Log[a + b\*x]\*Log[(e\*(a + b\*x))/(c + d\*x)]^2)/((b\*c - a\*d)\*g\*i) + (Log[a + b\*x]\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]^2)/((b\*c - a\*d)\*g\*i) + (B^2\*Log[a + b\*x]^2\*Log[c + d\*x])/((b\*c - a\*d)\*g\*i) + (2\*A\*B\*Log[-((d\*(a + b\*x))/(b\*c - a\*d))]\*Log[c + d\*x])/((b\*c - a\*d)\*g\*i) + (2\*B^2\*Log[a + b\*x]\*Log[(c + d\*x)^(-1)]\*Log[c + d\*x])/((b\*c - a\*d)\*g\*i) - (2\*B^2\*Log[-((d\*(a + b\*x))/(b\*c - a\*d))]\*(Log[a + b\*x] + Log[(c + d\*x)^(-1)] - Log[(e\*(a + b\*x))/(c + d\*x)]\*Log[c + d\*x])/((b\*c - a\*d)\*g\*i) - ((A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]^2\*Log[c + d\*x])/((b\*c - a\*d)\*g\*i) - (A\*B\*Log[c + d\*x]^2)/((b\*c - a\*d)\*g\*i) + (B^2\*Log[a + b\*x]\*Log[c + d\*x]^2)/((b\*c - a\*d)\*g\*i) - (B^2\*Log[(e\*(a + b\*x))/(c + d\*x)]\*Log[c + d\*x]^2)/((b\*c - a\*d)\*g\*i) - (B^2\*Log[c + d\*x]^3)/(3\*(b\*c - a\*d)\*g\*i) + (2\*A\*B\*Log[a + b\*x]\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]/((b\*c - a\*d)\*g\*i) - (B^2\*Log[a + b\*x]^2\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]/((b\*c - a\*d)\*g\*i) + (2\*A\*B



```
*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))]/((b*c - a*d)*g*i) - (2*B^2*Log[a
+ b*x]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))]/((b*c - a*d)*g*i) + (2*A*
B*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]/((b*c - a*d)*g*i) + (2*B^2*Log[(c
+ d*x)^(-1)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]/((b*c - a*d)*g*i) - (2*
B^2*(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)]*Pol
yLog[2, (b*(c + d*x))/(b*c - a*d)]/((b*c - a*d)*g*i) + (2*B^2*Log[(e*(a +
b*x))/(c + d*x)]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))]/((b*c - a*d)*g*
i) + (2*B^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))]/((b*c - a*d)*g*i) + (
2*B^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)]/((b*c - a*d)*g*i) + (2*B^2*Pol
yLog[3, 1 + (b*c - a*d)/(d*(a + b*x))]/((b*c - a*d)*g*i)
```

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFX^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFX, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFX^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFX_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFX, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFX, x] && IntegerQ[p]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifierIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]*(b_.))^(p_.)*((f_.) + (g_.)*(x_)^(q_.))*((h_.) + (i_.)*(x_)^(r_.)), x_Symbol] := Dist[1/e, Subst[Int[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
  x_Symbol] := Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

### Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] := Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
  Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

### Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] := With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s + 1)/(p*r*(s + 1)*(b*c
- a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q]^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
EqQ[p + q, 0] && NeQ[s, -1]
```

### Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] := -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q]^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

### Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.)]^(r_.)]^(s_.)*(u_), x_Symbol] := With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

### Rule 6610

Int[(u\_)\*PolyLog[n\_, v\_], x\_Symbol] := With[{w = DerivativeDivides[v, u\*v, x]}, Simp[w\*PolyLog[n + 1, v], x] /; !FalseQ[w]] /; FreeQ[n, x]

### Rule 2500

Int[(Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.)]^(r\_.))\*((s\_.) + Log[(i\_.)\*((g\_.) + (h\_.)\*(x\_))^(n\_.)]\*(t\_.)))/((j\_.) + (k\_.)\*(x\_)), x\_Symbol] := Dist[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q)^r] - Log[(a + b\*x)^(p\*r)] - Log[(c + d\*x)^(q\*r)], Int[(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x], x] + (Int[(Log[(a + b\*x)^(p\*r)]\*(s + t\*Log[i\*(g + h\*x)^n])]/(j + k\*x), x] + Int[(Log[(c + d\*x)^(q\*r)]\*(s + t\*Log[i\*(g + h\*x)^n])]/(j + k\*x), x)) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0]

### Rule 2433

Int[((a\_.) + Log[(c\_.)\*((d\_.) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.))\*((f\_.) + Log[(h\_.)\*((i\_.) + (j\_.)\*(x\_))^(m\_.)]\*(g\_.))\*((k\_.) + (l\_.)\*(x\_))^(r\_.), x\_Symbol] := Dist[1/e, Subst[Int[(k\*x)/d]^r\*(a + b\*Log[c\*x^n])^p\*(f + g\*Log[h\*(e\*i - d\*j)/e + (j\*x)/e]^m), x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e\*k - d\*1, 0]

### Rule 2375

Int[(Log[(d\_.)\*((e\_.) + (f\_.)\*(x\_))^(m\_.))]^(r\_.))\*((a\_.) + Log[(c\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.))/(x\_), x\_Symbol] := Simp[(Log[d\*(e + f\*x^m)^r]\*(a + b\*Log[c\*x^n])^(p + 1))/(b\*n\*(p + 1)), x] - Dist[(f\*m\*r)/(b\*n\*(p + 1)), Int[(x^(m - 1)\*(a + b\*Log[c\*x^n])^(p + 1))/(e + f\*x^m), x], x] /; FreeQ[{a, b, c, d, e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d\*e, 1]

### Rule 2374

Int[(Log[(d\_.)\*((e\_.) + (f\_.)\*(x\_))^(m\_.))]\*((a\_.) + Log[(c\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.))/(x\_), x\_Symbol] := -Simp[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^p)/m, x] + Dist[(b\*n\*p)/m, Int[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0] && EqQ[d\*e, 1]

### Rule 6589

Int[PolyLog[n\_, (c\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)]/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] := Simp[PolyLog[n + 1, c\*(a + b\*x)^p]/(e\*p), x] /; FreeQ[{a, b, c, d, e, n, p}, x] && EqQ[b\*d, a\*e]

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :=
Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*(i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] := Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m)))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*(s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.)
+ (k_.)*(x_)), x_Symbol] := Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q]^r)/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.)
*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_))^(n_.)]*(b_.))^(p_)/(x_), x_Symbol] := Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
x]
```

Rule 30

```
Int[(x_)^(m_), x_Symbol] := Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
```

$eQ[m, -1]$

Rubi steps

$$\begin{aligned}
\int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(88c + 88dx)(ag + bgx)} dx &= \int \left( \frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{88(bc - ad)g(a + bx)} - \frac{d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{88(bc - ad)g(c + dx)} \right) dx \\
&= \frac{b \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx} dx}{88(bc - ad)g} - \frac{d \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx} dx}{88(bc - ad)g} \\
&= \frac{\log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{88(bc - ad)g} - \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 \log(c + dx)}{88(bc - ad)g} - B \int \frac{(c+dx)^{\left(-\frac{d}{c+dx}\right)}}{c+dx} dx \\
&= \frac{\log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{88(bc - ad)g} - \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 \log(c + dx)}{88(bc - ad)g} - B \int \frac{(c+dx)^{\left(-\frac{d}{c+dx}\right)}}{c+dx} dx \\
&= \frac{\log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{88(bc - ad)g} - \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 \log(c + dx)}{88(bc - ad)g} - B \int \frac{(bc-ad)e \log(c+dx)}{c+dx} dx \\
&= \frac{\log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{88(bc - ad)g} - \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 \log(c + dx)}{88(bc - ad)g} - B \int \frac{\log(a+bx) \log(c+dx)}{(a+bx)(c+dx)} dx \\
&= \frac{\log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{88(bc - ad)g} - \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 \log(c + dx)}{88(bc - ad)g} - B \int \left( \frac{A \log(a+bx)}{(a+bx)(c+dx)} + \frac{B \log(a+bx) \log(c+dx)}{(a+bx)(c+dx)} \right) dx \\
&= \frac{\log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{88(bc - ad)g} - \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 \log(c + dx)}{88(bc - ad)g} - \frac{(AB) \int \frac{\log(a+bx) \log(c+dx)}{(a+bx)(c+dx)} dx}{44g} \\
&= -\frac{B^2 \log(a + bx) \log^2\left(\frac{e(a+bx)}{c+dx}\right)}{88(bc - ad)g} + \frac{\log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{88(bc - ad)g} - \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 \log(c + dx)}{88(bc - ad)g} \\
&= -\frac{B^2 \log\left(-\frac{bc-ad}{d(a+bx)}\right) \log^2\left(\frac{e(a+bx)}{c+dx}\right)}{88(bc - ad)g} - \frac{B^2 \log(a + bx) \log^2\left(\frac{e(a+bx)}{c+dx}\right)}{88(bc - ad)g} + \frac{\log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{88(bc - ad)g} \\
&= -\frac{AB \log^2(a + bx)}{88(bc - ad)g} - \frac{B^2 \log\left(-\frac{bc-ad}{d(a+bx)}\right) \log^2\left(\frac{e(a+bx)}{c+dx}\right)}{88(bc - ad)g} - \frac{B^2 \log(a + bx) \log^2\left(\frac{e(a+bx)}{c+dx}\right)}{88(bc - ad)g} + \frac{\log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{88(bc - ad)g} \\
&= -\frac{AB \log^2(a + bx)}{88(bc - ad)g} - \frac{B^2 \log\left(-\frac{bc-ad}{d(a+bx)}\right) \log^2\left(\frac{e(a+bx)}{c+dx}\right)}{88(bc - ad)g} - \frac{B^2 \log(a + bx) \log^2\left(\frac{e(a+bx)}{c+dx}\right)}{88(bc - ad)g} + \frac{\log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{88(bc - ad)g}
\end{aligned}$$

**Mathematica [A]** time = 0.364844, size = 79, normalized size = 1.8

$$\frac{3A^2 \log\left(\frac{e(a+bx)}{c+dx}\right) + 3AB \log^2\left(\frac{e(a+bx)}{c+dx}\right) + B^2 \log^3\left(\frac{e(a+bx)}{c+dx}\right)}{3bcgi - 3adgi}$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2/((a\*g + b\*g\*x)\*(c\*i + d\*i\*x)),x]

[Out] (3\*A^2\*Log[(e\*(a + b\*x))/(c + d\*x)] + 3\*A\*B\*Log[(e\*(a + b\*x))/(c + d\*x)]^2 + B^2\*Log[(e\*(a + b\*x))/(c + d\*x)]^3)/(3\*b\*c\*g\*i - 3\*a\*d\*g\*i)

**Maple [B]** time = 0.054, size = 312, normalized size = 7.1

$$-\frac{A^2 ad}{i(ad-bc)^2 g} \ln\left(\frac{be}{d} + \frac{e(ad-bc)}{(dx+c)d}\right) + \frac{A^2 bc}{i(ad-bc)^2 g} \ln\left(\frac{be}{d} + \frac{e(ad-bc)}{(dx+c)d}\right) - \frac{dABa}{i(ad-bc)^2 g} \left(\ln\left(\frac{be}{d} + \frac{e(ad-bc)}{(dx+c)d}\right)\right)^2 + \frac{1}{i(ad-bc)^2 g}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)/(d\*i\*x+c\*i),x)

[Out] -d/i/(a\*d-b\*c)^2/g\*A^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))\*a+1/i/(a\*d-b\*c)^2/g\*A^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))\*b\*c-d/i/(a\*d-b\*c)^2/g\*A\*B\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))^2\*a+1/i/(a\*d-b\*c)^2/g\*A\*B\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))^2\*b\*c-1/3\*d/i/(a\*d-b\*c)^2/g\*B^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))^3\*a+1/3/i/(a\*d-b\*c)^2/g\*B^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))^3\*b\*c

**Maxima [B]** time = 1.31962, size = 536, normalized size = 12.18

$$B^2 \left( \frac{\log(bx+a)}{(bc-ad)gi} - \frac{\log(dx+c)}{(bc-ad)gi} \right) \log\left(\frac{bex}{dx+c} + \frac{ae}{dx+c}\right)^2 + 2AB \left( \frac{\log(bx+a)}{(bc-ad)gi} - \frac{\log(dx+c)}{(bc-ad)gi} \right) \log\left(\frac{bex}{dx+c} + \frac{ae}{dx+c}\right) - \frac{1}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)/(d\*i\*x+c\*i),x, algorithm="maxima")



```
[Out] B^2*(log(b*x + a)/((b*c - a*d)*g*i) - log(d*x + c)/((b*c - a*d)*g*i))*log(b
*e*x/(d*x + c) + a*e/(d*x + c))^2 + 2*A*B*(log(b*x + a)/((b*c - a*d)*g*i) -
log(d*x + c)/((b*c - a*d)*g*i))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 1/3
*B^2*(3*(log(b*x + a)^2 - 2*log(b*x + a)*log(d*x + c) + log(d*x + c)^2)*log
(b*e*x/(d*x + c) + a*e/(d*x + c))/(b*c*g*i - a*d*g*i) - (log(b*x + a)^3 - 3
*log(b*x + a)^2*log(d*x + c) + 3*log(b*x + a)*log(d*x + c)^2 - log(d*x + c)
^3)/(b*c*g*i - a*d*g*i) + A^2*(log(b*x + a)/((b*c - a*d)*g*i) - log(d*x +
c)/((b*c - a*d)*g*i) - (log(b*x + a)^2 - 2*log(b*x + a)*log(d*x + c) + log
(d*x + c)^2)*A*B/(b*c*g*i - a*d*g*i)
```

**Fricas [B]** time = 0.494872, size = 184, normalized size = 4.18

$$\frac{B^2 \log\left(\frac{bex+ae}{dx+c}\right)^3 + 3AB \log\left(\frac{bex+ae}{dx+c}\right)^2 + 3A^2 \log\left(\frac{bex+ae}{dx+c}\right)}{3(bc-ad)gi}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)/(d*i*x+c*i),x, algorit
hm="fricas")
```

```
[Out] 1/3*(B^2*log((b*e*x + a*e)/(d*x + c))^3 + 3*A*B*log((b*e*x + a*e)/(d*x + c)
)^2 + 3*A^2*log((b*e*x + a*e)/(d*x + c)))/((b*c - a*d)*g*i)
```

**Sympy [B]** time = 2.24574, size = 206, normalized size = 4.68

$$A^2 \left( \frac{\log\left(x + \frac{-\frac{a^2d^2}{ad-bc} + \frac{2abcd}{ad-bc} + ad - \frac{b^2c^2}{ad-bc} + bc}{2bd}\right)}{gi(ad-bc)} - \frac{\log\left(x + \frac{\frac{a^2d^2}{ad-bc} - \frac{2abcd}{ad-bc} + ad + \frac{b^2c^2}{ad-bc} + bc}{2bd}\right)}{gi(ad-bc)} \right) - \frac{AB \log\left(\frac{e(a+bx)}{c+dx}\right)^2}{adgi - bcgi} - \frac{B^2 \log\left(\frac{e(a+bx)}{c+dx}\right)^3}{3adgi - 3bcgi}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)/(d*i*x+c*i),x)
```

```
[Out] A**2*(log(x + (-a**2*d**2/(a*d - b*c) + 2*a*b*c*d/(a*d - b*c) + a*d - b**2*
c**2/(a*d - b*c) + b*c)/(2*b*d))/(g*i*(a*d - b*c)) - log(x + (a**2*d**2/(a*
d - b*c) - 2*a*b*c*d/(a*d - b*c) + a*d + b**2*c**2/(a*d - b*c) + b*c)/(2*b*
d))/(g*i*(a*d - b*c))) - A*B*log(e*(a + b*x)/(c + d*x))**2/(a*d*g*i - b*c*g
```

\*i) - B\*\*2\*log(e\*(a + b\*x)/(c + d\*x))\*\*3/(3\*a\*d\*g\*i - 3\*b\*c\*g\*i)

**Giac [B]** time = 1.79133, size = 211, normalized size = 4.8

$$-\frac{B^2 i \log\left(\frac{bx+a}{dx+c}\right)^3}{3(bcg - adg)} - \frac{(ABi + B^2 i) \log\left(\frac{bx+a}{dx+c}\right)^2}{bcg - adg} - \frac{(A^2 i + 2ABi + B^2 i) \log\left(\left|\frac{2bdx+bc+ad-|bc+ad|}{2bdx+bc+ad+|bc+ad|}\right|\right)}{g|-bc + ad|}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)/(d\*i\*x+c\*i),x, algorithm="giac")

[Out] -1/3\*B^2\*i\*log((b\*x + a)/(d\*x + c))^3/(b\*c\*g - a\*d\*g) - (A\*B\*i + B^2\*i)\*log((b\*x + a)/(d\*x + c))^2/(b\*c\*g - a\*d\*g) - (A^2\*i + 2\*A\*B\*i + B^2\*i)\*log(abs((2\*b\*d\*x + b\*c + a\*d - abs(-b\*c + a\*d))/(2\*b\*d\*x + b\*c + a\*d + abs(-b\*c + a\*d))))/(g\*abs(-b\*c + a\*d))

$$3.89 \quad \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^2(ci+dix)} dx$$

**Optimal.** Leaf size=183

$$\frac{d\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)^3}{3Bg^2i(bc-ad)^2} - \frac{b(c+dx)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)^2}{g^2i(a+bx)(bc-ad)^2} - \frac{2bB(c+dx)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{g^2i(a+bx)(bc-ad)^2} - \frac{2bB^2(c+dx)}{g^2i(a+bx)(bc-ad)}$$

[Out]  $(-2*b*B^2*(c + d*x))/((b*c - a*d)^2*g^{2*i}(a + b*x)) - (2*b*B*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x])))/((b*c - a*d)^2*g^{2*i}(a + b*x)) - (b*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x]))^2)/((b*c - a*d)^2*g^{2*i}(a + b*x)) - (d*(A + B*Log[(e*(a + b*x))/(c + d*x]))^3)/(3*B*(b*c - a*d)^2*g^{2*i})$

**Rubi [C]** time = 6.33136, antiderivative size = 1684, normalized size of antiderivative = 9.2, number of steps used = 87, number of rules used = 31, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.738$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))^2/((a\*g + b\*g\*x)^2\*(c\*i + d\*i\*x)), x]

[Out]  $(-2*B^2)/((b*c - a*d)*g^{2*i}(a + b*x)) - (2*B^2*d*Log[a + b*x])/((b*c - a*d)^2*g^{2*i}) + (A*B*d*Log[a + b*x]^2)/((b*c - a*d)^2*g^{2*i}) + (B^2*d*Log[a + b*x]^2)/((b*c - a*d)^2*g^{2*i}) - (B^2*d*Log[a + b*x]*Log[(c + d*x)^{-1}]^2)/((b*c - a*d)^2*g^{2*i}) + (B^2*d*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^{-1}]^2)/((b*c - a*d)^2*g^{2*i}) + (B^2*d*Log[-((b*c - a*d)/(d*(a + b*x))])*Log[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^2*g^{2*i}) + (B^2*d*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^2*g^{2*i}) - (2*B*(A + B*Log[(e*(a + b*x))/(c + d*x])))/((b*c - a*d)*g^{2*i}(a + b*x)) - (2*B*d*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x])))/((b*c - a*d)^2*g^{2*i}) - (A + B*Log[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)*g^{2*i}(a + b*x)) - (d*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^2*g^{2*i}) + (2*B^2*d*Log[c + d*x])/((b*c - a*d)^2*g^{2*i}) - (B^2*d*Log[a + b*x]^2*Log[c + d*x])/((b*c - a*d)^2*g^{2*i}) - (2*A*B*d*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)^2*g^{2*i}) - (2*B^2*d*Log[-((d*(a + b*x))/(b*c - a*d))]*L$

```

og[c + d*x]]/((b*c - a*d)^2*g^2*i) - (2*B^2*d*Log[a + b*x]*Log[(c + d*x)^(-
1)]*Log[c + d*x])/((b*c - a*d)^2*g^2*i) + (2*B^2*d*Log[-((d*(a + b*x))/(b*c
- a*d))]*(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)
])*Log[c + d*x])/((b*c - a*d)^2*g^2*i) + (2*B*d*(A + B*Log[(e*(a + b*x))/(c
+ d*x]))*Log[c + d*x])/((b*c - a*d)^2*g^2*i) + (d*(A + B*Log[(e*(a + b*x))
/(c + d*x)])^2*Log[c + d*x])/((b*c - a*d)^2*g^2*i) + (A*B*d*Log[c + d*x]^2)
/((b*c - a*d)^2*g^2*i) + (B^2*d*Log[c + d*x]^2)/((b*c - a*d)^2*g^2*i) - (B^
2*d*Log[a + b*x]*Log[c + d*x]^2)/((b*c - a*d)^2*g^2*i) + (B^2*d*Log[(e*(a +
b*x))/(c + d*x)]*Log[c + d*x]^2)/((b*c - a*d)^2*g^2*i) + (B^2*d*Log[c + d*
x]^3)/(3*(b*c - a*d)^2*g^2*i) - (2*A*B*d*Log[a + b*x]*Log[(b*(c + d*x))/(b*
c - a*d)])/((b*c - a*d)^2*g^2*i) - (2*B^2*d*Log[a + b*x]*Log[(b*(c + d*x))/
(b*c - a*d)])/((b*c - a*d)^2*g^2*i) + (B^2*d*Log[a + b*x]^2*Log[(b*(c + d*x)
)/(b*c - a*d)])/((b*c - a*d)^2*g^2*i) - (2*A*B*d*PolyLog[2, -((d*(a + b*x)
)/(b*c - a*d))])/((b*c - a*d)^2*g^2*i) - (2*B^2*d*PolyLog[2, -((d*(a + b*x)
)/(b*c - a*d))])/((b*c - a*d)^2*g^2*i) + (2*B^2*d*Log[a + b*x]*PolyLog[2, -
((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^2*g^2*i) - (2*A*B*d*PolyLog[2, (
b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g^2*i) - (2*B^2*d*PolyLog[2, (b*(
c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g^2*i) - (2*B^2*d*Log[(c + d*x)^(-1)
]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g^2*i) + (2*B^2*d*(
Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*PolyLog[
2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g^2*i) - (2*B^2*d*Log[(e*(a +
b*x))/(c + d*x)]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^2
*g^2*i) - (2*B^2*d*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^2
*g^2*i) - (2*B^2*d*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g^
2*i) - (2*B^2*d*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^2*g
^2*i)

```

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]

```

### Rule 2525

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]

```

### Rule 12

Int[(a\_)\*(u\_), x\_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b\_)\*(v\_)] /; FreeQ[b, x]

#### Rule 44

Int[((a\_) + (b\_)\*(x\_)^(m\_))\*((c\_) + (d\_)\*(x\_)^(n\_)), x\_Symbol] := Int[ExpandIntegrand[(a + b\*x)^m\*(c + d\*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b\*c - a\*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])

#### Rule 2524

Int[((a\_) + Log[(c\_)\*(RFx\_)^(p\_)])\*(b\_)^(n\_)/((d\_) + (e\_)\*(x\_)), x\_Symbol] := Simp[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^n)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

#### Rule 2418

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_)^(n\_))])\*(b\_)^(p\_)\*(RFx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]

#### Rule 2390

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_)^(n\_))])\*(b\_)^(p\_)\*((f\_) + (g\_)\*(x\_)^(q\_)), x\_Symbol] := Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

#### Rule 2301

Int[((a\_) + Log[(c\_)\*(x\_)^(n\_)]\*(b\_))/(x\_), x\_Symbol] := Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

#### Rule 2394

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_)^(n\_))])\*(b\_)/((f\_) + (g\_)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

#### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rule 6688

```
Int[u_, x_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

### Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

### Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_)^(q_.))*((h_.) + (i_.)*(x_)^(r_.)), x_Symbol] := Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

### Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] := Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

### Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] := Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

### Rule 2507

```

Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] := With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
h*x)^t]^u)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s + 1))/(p*r*(s + 1)*(b*c
- a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q]^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
EqQ[p + q, 0] && NeQ[s, -1]

```

### Rule 2488

```

Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] := -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q]^r]^(s - 1))/(a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]

```

### Rule 2506

```

Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] := With[{g = Simplify[(v - 1)*(c + d
*x)/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s - 1))/(
(a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]

```

### Rule 6610

```

Int[(u_)*PolyLog[n_, v_], x_Symbol] := With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /; !FalseQ[w] /; FreeQ[n, x]

```

### Rule 2500

```

Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*(s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))/((j_.) + (k
_.)*(x_)), x_Symbol] := Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]

```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e]^m)], x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*1, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]^(r_.))*((a_.) + Log[(c_.)*(x_)^(n_
.))*((b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Symbol] :>
Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*1)/l) + (e*x)/l)^n]*(f +
g*Log[h*(-((j*k - i*1)/l) + (j*x)/l)^m)], x], x, k + l*x], x] /; FreeQ[{a,
b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n]*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n])]/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x]
*(f + g*Log[h*(i + j*x)^m])]/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
```



, g, h, i, j, m, n}, x] && EqQ[e\*i - d\*j, 0]

### Rule 2499

Int[(Log[(e\_.)\*((f\_.)\*(a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.) )^(r\_.)]\*((s\_.) + Log[(i\_.)\*(g\_.) + (h\_.)\*(x\_)]^(n\_.)]\*(t\_.))^(m\_.))/((j\_. ) + (k\_.)\*(x\_)), x\_Symbol] := Simp[((s + t\*Log[i\*(g + h\*x)^n])^(m + 1)\*Log[ e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r)/(k\*n\*t\*(m + 1)), x] + (-Dist[(b\*p\*r)/(k\*n \*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(a + b\*x), x], x] - Dis t[(d\*q\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(c + d\*x) , x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0] && EqQ[h\*j - g\*k, 0] && IGtQ[m, 0]

### Rule 2396

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_)/((f\_.) + (g\_. )\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])^p)/g, x] - Dist[(b\*e\*n\*p)/g, Int[(Log[(e\*(f + g\*x))/(e\*f - d\*g)] \* (a + b\*Log[c\*(d + e\*x)^n])^(p - 1))/(d + e\*x), x], x] /; FreeQ[{a, b, c, d , e, f, g, n, p}, x] && NeQ[e\*f - d\*g, 0] && IGtQ[p, 1]

### Rule 2302

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/(x\_), x\_Symbol] := Dist[1/( b\*n), Subst[Int[x^p, x], x, a + b\*Log[c\*x^n]], x] /; FreeQ[{a, b, c, n, p}, x]

### Rule 30

Int[(x\_)^(m\_.), x\_Symbol] := Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && NeQ[m, -1]

### Rubi steps

$$\begin{aligned}
\int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(89c + 89dx)(ag + bgx)^2} dx &= \int \left( \frac{b\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc - ad)g^2(a + bx)^2} - \frac{bd\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc - ad)^2g^2(a + bx)} + \frac{d^2\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc - ad)^2g^2(c + dx)} \right) dx \\
&= -\frac{(bd) \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx} dx}{89(bc - ad)^2g^2} + \frac{d^2 \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx} dx}{89(bc - ad)^2g^2} + \frac{b \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^2} dx}{89(bc - ad)g^2} \\
&= -\frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc - ad)g^2(a + bx)} - \frac{d \log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc - ad)^2g^2} + \frac{d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc - ad)g^2} \\
&= -\frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc - ad)g^2(a + bx)} - \frac{d \log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc - ad)^2g^2} + \frac{d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc - ad)g^2} \\
&= -\frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc - ad)g^2(a + bx)} - \frac{d \log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc - ad)^2g^2} + \frac{d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc - ad)g^2} \\
&= -\frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc - ad)g^2(a + bx)} - \frac{d \log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc - ad)^2g^2} + \frac{d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{89(bc - ad)g^2} \\
&= -\frac{2B \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{89(bc - ad)g^2(a + bx)} - \frac{2Bd \log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{89(bc - ad)^2g^2} - \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{89(bc - ad)g^2(a + bx)} \\
&= -\frac{2B \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{89(bc - ad)g^2(a + bx)} - \frac{2Bd \log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{89(bc - ad)^2g^2} - \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{89(bc - ad)g^2(a + bx)} \\
&= \frac{B^2d \log(a + bx) \log^2\left(\frac{e(a+bx)}{c+dx}\right)}{89(bc - ad)^2g^2} - \frac{2B \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{89(bc - ad)g^2(a + bx)} - \frac{2Bd \log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{89(bc - ad)^2g^2} \\
&= -\frac{2B^2}{89(bc - ad)g^2(a + bx)} - \frac{2B^2d \log(a + bx)}{89(bc - ad)^2g^2} + \frac{B^2d \log\left(-\frac{bc-ad}{d(a+bx)}\right) \log^2\left(\frac{e(a+bx)}{c+dx}\right)}{89(bc - ad)^2g^2} + \frac{B^2d \log\left(-\frac{bc-ad}{d(a+bx)}\right) \log\left(\frac{e(a+bx)}{c+dx}\right)}{89(bc - ad)^2g^2} \\
&= -\frac{2B^2}{89(bc - ad)g^2(a + bx)} - \frac{2B^2d \log(a + bx)}{89(bc - ad)^2g^2} + \frac{ABd \log^2(a + bx)}{89(bc - ad)^2g^2} + \frac{B^2d \log\left(-\frac{bc-ad}{d(a+bx)}\right) \log\left(\frac{e(a+bx)}{c+dx}\right)}{89(bc - ad)^2g^2} \\
&= -\frac{2B^2}{89(bc - ad)g^2(a + bx)} - \frac{2B^2d \log(a + bx)}{89(bc - ad)^2g^2} + \frac{ABd \log^2(a + bx)}{89(bc - ad)^2g^2} + \frac{B^2d \log^2(a + bx)}{89(bc - ad)^2g^2} +
\end{aligned}$$

**Mathematica [A]** time = 0.663086, size = 186, normalized size = 1.02

$$\frac{3(A^2 + 2AB + 2B^2)(-d(a + bx)\log(c + dx) - ad + bc) + 3d(A^2 + 2AB + 2B^2)(a + bx)\log(a + bx) + 3B(aAd + Abd)}{3g^2i(a + bx)(bc - ad)^2}$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2/((a\*g + b\*g\*x)^2\*(c\*i + d\*i\*x)), x]

[Out] 
$$-(3(A^2 + 2A*B + 2B^2)*d*(a + b*x)*\text{Log}[a + b*x] + 6*B*(A + B)*(b*c - a*d)*\text{Log}[(e*(a + b*x))/(c + d*x)] + 3*B*(a*A*d + A*b*d*x + b*B*(c + d*x))*\text{Log}[(e*(a + b*x))/(c + d*x)]^2 + B^2*d*(a + b*x)*\text{Log}[(e*(a + b*x))/(c + d*x)]^3 + 3*(A^2 + 2A*B + 2B^2)*(b*c - a*d - d*(a + b*x)*\text{Log}[c + d*x]))/(3*(b*c - a*d)^2*g^2*i*(a + b*x))$$

**Maple [B]** time = 0.054, size = 1201, normalized size = 6.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^2/(d\*i\*x+c\*i), x)

[Out] 
$$-d^2/i/(a*d-b*c)^3/g^2*A^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+d/i/(a*d-b*c)^3/g^2*A^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c-e*d/i/(a*d-b*c)^3/g^2*A^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+e/i/(a*d-b*c)^3/g^2*A^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c-d^2/i/(a*d-b*c)^3/g^2*A*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+d/i/(a*d-b*c)^3/g^2*A*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b*c-2*e*d/i/(a*d-b*c)^3/g^2*A*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+2*e/i/(a*d-b*c)^3/g^2*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-2*e*d/i/(a*d-b*c)^3/g^2*A*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+2*e/i/(a*d-b*c)^3/g^2*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c-1/3*d^2/i/(a*d-b*c)^3/g^2*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*a+1/3*d/i/(a*d-b*c)^3/g^2*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*b*c-e*d/i/(a*d-b*c)^3/g^2*B^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+e/i/(a*d-b*c)^3/g^2*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-2*e*d/i/(a*d-b*c)^3/g^2*B^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-2*e*d/i/(a*d-b*c)^3/g^2*B^2*b/$$

$(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+2*e/i/(a*d-b*c)^3/g^2*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c$

**Maxima [B]** time = 1.53342, size = 1361, normalized size = 7.44

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^2/(d\*i\*x+c\*i),x, algorith="maxima")

[Out] 
$$-B^2*(1/((b^2*c - a*b*d)*g^{2*i*x} + (a*b*c - a^2*d)*g^{2*i}) + d*\log(b*x + a)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g^{2*i}) - d*\log(d*x + c)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g^{2*i}))*\log(b*e*x/(d*x + c) + a*e/(d*x + c))^2 - 2*A*B*(1/((b^2*c - a*b*d)*g^{2*i*x} + (a*b*c - a^2*d)*g^{2*i}) + d*\log(b*x + a)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g^{2*i}) - d*\log(d*x + c)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g^{2*i}))*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 1/3*B^2*(3*((b*d*x + a*d)*\log(b*x + a)^2 + (b*d*x + a*d)*\log(d*x + c)^2 - 2*b*c + 2*a*d - 2*(b*d*x + a*d)*\log(b*x + a) + 2*(b*d*x + a*d - (b*d*x + a*d)*\log(b*x + a))*\log(d*x + c))*\log(b*e*x/(d*x + c) + a*e/(d*x + c))/(a*b^2*c^2*g^{2*i} - 2*a^2*b*c*d*g^{2*i} + a^3*d^2*g^{2*i} + (b^3*c^2*g^{2*i} - 2*a*b^2*c*d*g^{2*i} + a^2*b*d^2*g^{2*i})*x) - ((b*d*x + a*d)*\log(b*x + a)^3 - (b*d*x + a*d)*\log(d*x + c)^3 - 3*(b*d*x + a*d)*\log(b*x + a)^2 - 3*(b*d*x + a*d - (b*d*x + a*d)*\log(b*x + a))*\log(d*x + c)^2 + 6*b*c - 6*a*d + 6*(b*d*x + a*d)*\log(b*x + a) - 3*(2*b*d*x + (b*d*x + a*d)*\log(b*x + a)^2 + 2*a*d - 2*(b*d*x + a*d)*\log(b*x + a))*\log(d*x + c))/(a*b^2*c^2*g^{2*i} - 2*a^2*b*c*d*g^{2*i} + a^3*d^2*g^{2*i} + (b^3*c^2*g^{2*i} - 2*a*b^2*c*d*g^{2*i} + a^2*b*d^2*g^{2*i})*x) - A^2*(1/((b^2*c - a*b*d)*g^{2*i*x} + (a*b*c - a^2*d)*g^{2*i}) + d*\log(b*x + a)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g^{2*i}) - d*\log(d*x + c)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g^{2*i})) + ((b*d*x + a*d)*\log(b*x + a)^2 + (b*d*x + a*d)*\log(d*x + c)^2 - 2*b*c + 2*a*d - 2*(b*d*x + a*d)*\log(b*x + a) + 2*(b*d*x + a*d - (b*d*x + a*d)*\log(b*x + a))*\log(d*x + c))*A*B/(a*b^2*c^2*g^{2*i} - 2*a^2*b*c*d*g^{2*i} + a^3*d^2*g^{2*i} + (b^3*c^2*g^{2*i} - 2*a*b^2*c*d*g^{2*i} + a^2*b*d^2*g^{2*i})*x)$$

**Fricas [A]** time = 0.521856, size = 512, normalized size = 2.8

$$\frac{(B^2 b d x + B^2 a d) \log\left(\frac{b e x + a e}{d x + c}\right)^3 + 3(A^2 + 2 A B + 2 B^2) b c - 3(A^2 + 2 A B + 2 B^2) a d + 3(B^2 b c + A B a d + (A B + B^2) b d x)}{3((b^3 c^2 - 2 a b^2 c d + a^2 b d^2) g^2 i x + (a b^2 c^2 - 2 a^2 b c d$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^2/(d\*i\*x+c\*i),x, algorithm="fricas")

[Out] 
$$-1/3*((B^2*b*d*x + B^2*a*d)*\log((b*e*x + a*e)/(d*x + c))^3 + 3*(A^2 + 2*A*B + 2*B^2)*b*c - 3*(A^2 + 2*A*B + 2*B^2)*a*d + 3*(B^2*b*c + A*B*a*d + (A*B + B^2)*b*d*x)*\log((b*e*x + a*e)/(d*x + c))^2 + 3*(A^2*a*d + (A^2 + 2*A*B + 2*B^2)*b*d*x + 2*(A*B + B^2)*b*c)*\log((b*e*x + a*e)/(d*x + c)))/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^2*i*x + (a*b^2*c^2 - 2*a^2*b*c*d + a^3*d^2)*g^2*i)$$

**Sympy [B]** time = 4.5508, size = 541, normalized size = 2.96

$$\frac{B^2 d \log\left(\frac{e(a+bx)}{c+dx}\right)^3}{3a^2 d^2 g^2 i - 6abcdg^2 i + 3b^2 c^2 g^2 i} + \frac{(2AB + 2B^2) \log\left(\frac{e(a+bx)}{c+dx}\right)}{a^2 d g^2 i - abcg^2 i + abdg^2 ix - b^2 c g^2 ix} + (A^2 + 2AB + 2B^2) \left( \frac{d \log\left(x + \frac{-\frac{a^3 d^4}{(ad-bc)^2} + \frac{3a^2 bc}{ad-bc}}{g^2 i (a^2 d^2 g^2 i - 6abcdg^2 i + 3b^2 c^2 g^2 i)}\right)}{g^2 i (a^2 d^2 g^2 i - 6abcdg^2 i + 3b^2 c^2 g^2 i)} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*(b\*x+a)/(d\*x+c)))\*\*2/(b\*g\*x+a\*g)\*\*2/(d\*i\*x+c\*i),x)

[Out] 
$$-B**2*d*\log(e*(a + b*x)/(c + d*x))**3/(3*a**2*d**2*g**2*i - 6*a*b*c*d*g**2*i + 3*b**2*c**2*g**2*i) + (2*A*B + 2*B**2)*\log(e*(a + b*x)/(c + d*x))/(a**2*d*g**2*i - a*b*c*g**2*i + a*b*d*g**2*i*x - b**2*c*g**2*i*x) + (A**2 + 2*A*B + 2*B**2)*(d*\log(x + (-a**3*d**4/(a*d - b*c))**2 + 3*a**2*b*c*d**3/(a*d - b*c))**2 - 3*a*b**2*c**2*d**2/(a*d - b*c)**2 + a*d**2 + b**3*c**3*d/(a*d - b*c))**2 + b*c*d)/(2*b*d**2))/(g**2*i*(a*d - b*c)**2) - d*\log(x + (a**3*d**4/(a*d - b*c)**2 - 3*a**2*b*c*d**3/(a*d - b*c)**2 + 3*a*b**2*c**2*d**2/(a*d - b*c)**2 + a*d**2 - b**3*c**3*d/(a*d - b*c)**2 + b*c*d)/(2*b*d**2))/(g**2*i*(a*d - b*c)**2) + 1/(a**2*d*g**2*i - a*b*c*g**2*i + x*(a*b*d*g**2*i - b**2*c*g**2*i)) + (-A*B*a*d - A*B*b*d*x - B**2*b*c - B**2*b*d*x)*\log(e*(a + b*x)/(c + d*x))**2/(a**3*d**2*g**2*i - 2*a**2*b*c*d*g**2*i + a**2*b*d**2*g**2*i*x + a*b**2*c**2*g**2*i - 2*a*b**2*c*d*g**2*i*x + b**3*c**2*g**2*i*x)$$

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B \log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)^2}{(bgx + ag)^2(dx + ci)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2/(d*i*x+c*i),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/((b*g*x + a*g)^2*(d*i*x + c*i)), x)
```

$$3.90 \quad \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^3(ci+dix)} dx$$

**Optimal.** Leaf size=343

$$\frac{b^2(c+dx)^2 \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)^2}{2g^3i(a+bx)^2(bc-ad)^3} - \frac{b^2B(c+dx)^2 \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{2g^3i(a+bx)^2(bc-ad)^3} + \frac{d^2 \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)^3}{3Bg^3i(bc-ad)^3} + \frac{2bd(c+dx) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{g^3i(a+bx)^2(bc-ad)^3}$$

[Out]  $(4*b*B^2*d*(c+d*x))/((b*c-a*d)^3*g^3*i*(a+b*x)) - (b^2*B^2*(c+d*x)^2)/(4*(b*c-a*d)^3*g^3*i*(a+b*x)^2) + (4*b*B*d*(c+d*x)*(A+B*Log[(e*(a+b*x))/(c+d*x)]))/((b*c-a*d)^3*g^3*i*(a+b*x)) - (b^2*B*(c+d*x)^2*(A+B*Log[(e*(a+b*x))/(c+d*x)]))/(2*(b*c-a*d)^3*g^3*i*(a+b*x)^2) + (2*b*d*(c+d*x)*(A+B*Log[(e*(a+b*x))/(c+d*x]])^2)/((b*c-a*d)^3*g^3*i*(a+b*x)) - (b^2*(c+d*x)^2*(A+B*Log[(e*(a+b*x))/(c+d*x]])^2)/(2*(b*c-a*d)^3*g^3*i*(a+b*x)^2) + (d^2*(A+B*Log[(e*(a+b*x))/(c+d*x]])^3)/(3*B*(b*c-a*d)^3*g^3*i)$

**Rubi [C]** time = 7.36569, antiderivative size = 1899, normalized size of antiderivative = 5.54, number of steps used = 117, number of rules used = 31, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.738$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2/((a\*g + b\*g\*x)^3\*(c\*i + d\*i\*x)), x]

[Out]  $-B^2/(4*(b*c-a*d)*g^3*i*(a+b*x)^2) + (7*B^2*d)/(2*(b*c-a*d)^2*g^3*i*(a+b*x)) + (7*B^2*d^2*Log[a+b*x])/((b*c-a*d)^3*g^3*i) - (A*B*d^2*Log[a+b*x]^2)/((b*c-a*d)^3*g^3*i) - (3*B^2*d^2*Log[a+b*x]^2)/(2*(b*c-a*d)^3*g^3*i) + (B^2*d^2*Log[a+b*x]*Log[(c+d*x)^(-1)]^2)/((b*c-a*d)^3*g^3*i) - (B^2*d^2*Log[-((d*(a+b*x))/(b*c-a*d))]*Log[(c+d*x)^(-1)]^2)/((b*c-a*d)^3*g^3*i) - (B^2*d^2*Log[-((b*c-a*d)/(d*(a+b*x))])*Log[(e*(a+b*x))/(c+d*x)]^2)/((b*c-a*d)^3*g^3*i) - (B^2*d^2*Log[a+b*x]*Log[(e*(a+b*x))/(c+d*x)]^2)/((b*c-a*d)^3*g^3*i) - (B*(A+B*Log[(e*(a+b*x))/(c+d*x)]))/(2*(b*c-a*d)*g^3*i*(a+b*x)^2) + (3*B*d*(A+B*Log[(e*(a+b*x))/(c+d*x)]))/((b*c-a*d)^2*g^3*i*(a+b*x)) + (3*B*d^2*Log[a+b*x])$

$$\begin{aligned}
& *x] * (A + B * \text{Log}[(e*(a + b*x))/(c + d*x)]) / ((b*c - a*d)^3 * g^3 * i) - (A + B * \text{Log} \\
& \text{g}[(e*(a + b*x))/(c + d*x)]^2 / (2*(b*c - a*d) * g^3 * i * (a + b*x)^2) + (d*(A + B \\
& * \text{Log}[(e*(a + b*x))/(c + d*x)]^2) / ((b*c - a*d)^2 * g^3 * i * (a + b*x)) + (d^2 * \text{Log} \\
& \text{g}[a + b*x] * (A + B * \text{Log}[(e*(a + b*x))/(c + d*x)]^2) / ((b*c - a*d)^3 * g^3 * i) - \\
& (7 * B^2 * d^2 * \text{Log}[c + d*x]) / (2*(b*c - a*d)^3 * g^3 * i) + (B^2 * d^2 * \text{Log}[a + b*x]^2 * \\
& \text{Log}[c + d*x]) / ((b*c - a*d)^3 * g^3 * i) + (2 * A * B * d^2 * \text{Log}[-((d*(a + b*x)) / (b*c - \\
& a*d)]) * \text{Log}[c + d*x]) / ((b*c - a*d)^3 * g^3 * i) + (3 * B^2 * d^2 * \text{Log}[-((d*(a + b*x)) \\
& ) / (b*c - a*d)]) * \text{Log}[c + d*x]) / ((b*c - a*d)^3 * g^3 * i) + (2 * B^2 * d^2 * \text{Log}[a + b*x] \\
& * \text{Log}[(c + d*x)^{-1}] * \text{Log}[c + d*x]) / ((b*c - a*d)^3 * g^3 * i) - (2 * B^2 * d^2 * \text{Log} \\
& [-((d*(a + b*x)) / (b*c - a*d))] * (\text{Log}[a + b*x] + \text{Log}[(c + d*x)^{-1}] - \text{Log}[(e \\
& *(a + b*x)) / (c + d*x)]) * \text{Log}[c + d*x]) / ((b*c - a*d)^3 * g^3 * i) - (3 * B * d^2 * (A + \\
& B * \text{Log}[(e*(a + b*x)) / (c + d*x)]) * \text{Log}[c + d*x]) / ((b*c - a*d)^3 * g^3 * i) - (d^2 \\
& * (A + B * \text{Log}[(e*(a + b*x)) / (c + d*x)]^2 * \text{Log}[c + d*x]) / ((b*c - a*d)^3 * g^3 * i) \\
& - (A * B * d^2 * \text{Log}[c + d*x]^2) / ((b*c - a*d)^3 * g^3 * i) - (3 * B^2 * d^2 * \text{Log}[c + d*x] \\
& ^2) / (2*(b*c - a*d)^3 * g^3 * i) + (B^2 * d^2 * \text{Log}[a + b*x] * \text{Log}[c + d*x]^2) / ((b*c - \\
& a*d)^3 * g^3 * i) - (B^2 * d^2 * \text{Log}[(e*(a + b*x)) / (c + d*x)] * \text{Log}[c + d*x]^2) / ((b* \\
& c - a*d)^3 * g^3 * i) - (B^2 * d^2 * \text{Log}[c + d*x]^3) / (3*(b*c - a*d)^3 * g^3 * i) + (2 * A \\
& * B * d^2 * \text{Log}[a + b*x] * \text{Log}[(b*(c + d*x)) / (b*c - a*d)]) / ((b*c - a*d)^3 * g^3 * i) + \\
& (3 * B^2 * d^2 * \text{Log}[a + b*x] * \text{Log}[(b*(c + d*x)) / (b*c - a*d)]) / ((b*c - a*d)^3 * g^3 * \\
& i) - (B^2 * d^2 * \text{Log}[a + b*x]^2 * \text{Log}[(b*(c + d*x)) / (b*c - a*d)]) / ((b*c - a*d)^ \\
& 3 * g^3 * i) + (2 * A * B * d^2 * \text{PolyLog}[2, -((d*(a + b*x)) / (b*c - a*d))]) / ((b*c - a*d) \\
& ^3 * g^3 * i) + (3 * B^2 * d^2 * \text{PolyLog}[2, -((d*(a + b*x)) / (b*c - a*d))]) / ((b*c - a \\
& *d)^3 * g^3 * i) - (2 * B^2 * d^2 * \text{Log}[a + b*x] * \text{PolyLog}[2, -((d*(a + b*x)) / (b*c - a* \\
& d))]) / ((b*c - a*d)^3 * g^3 * i) + (2 * A * B * d^2 * \text{PolyLog}[2, (b*(c + d*x)) / (b*c - a* \\
& d)]) / ((b*c - a*d)^3 * g^3 * i) + (3 * B^2 * d^2 * \text{PolyLog}[2, (b*(c + d*x)) / (b*c - a*d \\
& )]) / ((b*c - a*d)^3 * g^3 * i) + (2 * B^2 * d^2 * \text{Log}[(c + d*x)^{-1}] * \text{PolyLog}[2, (b*(c \\
& + d*x)) / (b*c - a*d)]) / ((b*c - a*d)^3 * g^3 * i) - (2 * B^2 * d^2 * (\text{Log}[a + b*x] + \text{L} \\
& \text{og}[(c + d*x)^{-1}] - \text{Log}[(e*(a + b*x)) / (c + d*x)]) * \text{PolyLog}[2, (b*(c + d*x)) \\
& / (b*c - a*d)]) / ((b*c - a*d)^3 * g^3 * i) + (2 * B^2 * d^2 * \text{Log}[(e*(a + b*x)) / (c + d* \\
& x)] * \text{PolyLog}[2, 1 + (b*c - a*d) / (d*(a + b*x))]) / ((b*c - a*d)^3 * g^3 * i) + (2 * B \\
& ^2 * d^2 * \text{PolyLog}[3, -((d*(a + b*x)) / (b*c - a*d))]) / ((b*c - a*d)^3 * g^3 * i) + (2 \\
& * B^2 * d^2 * \text{PolyLog}[3, (b*(c + d*x)) / (b*c - a*d)]) / ((b*c - a*d)^3 * g^3 * i) + (2 * \\
& B^2 * d^2 * \text{PolyLog}[3, 1 + (b*c - a*d) / (d*(a + b*x))]) / ((b*c - a*d)^3 * g^3 * i)
\end{aligned}$$

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]

```

### Rule 2525

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))

```



```
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

### Rule 2524

```
Int[((a_) + Log[(c_)*(RFx_)^(p_)]*(b_))^(n_)/((d_) + (e_)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_))^(n_)]*(b_))^(p_)*(RFx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]
```

### Rule 2390

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_))^(n_)]*(b_))^(p_)*((f_) + (g_)*(x_))^(q_), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_) + Log[(c_)*(x_))^(n_)]*(b_)/(x_), x_Symbol] := Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rule 6688

```
Int[u_, x_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifierIntegrandQ[v, u, x]]
```

### Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]
```

### Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] := Dist[1/e, Subst[Int[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

### Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_Symbol] := Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]
```

### Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_.) + (e_.)*(x_)), x_Symbol]
:> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
  Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b,
  c, d, e, n}, x] && IGtQ[p, 0]
```

### Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_Symbol]
:> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
  h*x)^t]^u)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s + 1)/(p*r*(s + 1)*(b*c
  - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
  b*x)^p*(c + d*x)^q]^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x] /; FreeQ[{
  a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
  EqQ[p + q, 0] && NeQ[s, -1]
```

### Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol]
:> -Simp[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/h, x]
+ Dist[(p*r*s*(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q]^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ[
b*g - a*h, 0] && IGtQ[s, 0]
```

### Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))
^(q_.)]^(r_.)]^(s_.)*(u_), x_Symbol]
:> With[{g = Simplify[(v - 1)*(c + d*x)/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]},
-Simp[(h*PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/(b*c - a*d), x]
+ Dist[h*p*r*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f,
p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

### Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol]
:> With[{w = DerivativeDivides[v, u*v, x]}, Simp[w*PolyLog[n + 1, v], x] /;
!FalseQ[w]] /; FreeQ[n, x]
```

### Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]*(s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))/((j_.) + (k
```

```

_.)*(x_), x_Symbol] := Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a + b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x), x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ[b*c - a*d, 0]

```

### Rule 2433

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Symbol] := Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(e*i - d*j)/e + (j*x)/e]^m), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]

```

### Rule 2375

```

Int[(Log[(d_.)*((e_) + (f_.)*(x_))^(m_.))]^(r_.))*((a_.) + Log[(c_.)*(x_))^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] := Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m - 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d, e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]

```

### Rule 2374

```

Int[(Log[(d_.)*((e_) + (f_.)*(x_))^(m_.))]*(a_.) + Log[(c_.)*(x_))^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] := -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0] && EqQ[d*e, 1]

```

### Rule 6589

```

Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d, e, n, p}, x] && EqQ[b*d, a*e]

```

### Rule 2440

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Symbol] := Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f + g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]

```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
)*(i_.) + (j_.)*(x_)^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m)))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*(s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q]^r)/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_))/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_))/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(90c + 90dx)(ag + bgx)^3} dx &= \int \left( \frac{b\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{90(bc - ad)g^3(a + bx)^3} - \frac{bd\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{90(bc - ad)^2g^3(a + bx)^2} + \frac{bd^2\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{90(bc - ad)^3g^3(a + bx)} \right) dx \\
&= \frac{(bd^2) \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx} dx}{90(bc - ad)^3g^3} - \frac{d^3 \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx} dx}{90(bc - ad)^3g^3} - \frac{(bd) \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^2} dx}{90(bc - ad)^2g^3} + \dots \\
&= -\frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{180(bc - ad)g^3(a + bx)^2} + \frac{d\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{90(bc - ad)^2g^3(a + bx)} + \frac{d^2 \log(a + bx)\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{90(bc - ad)^3g^3} \\
&= -\frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{180(bc - ad)g^3(a + bx)^2} + \frac{d\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{90(bc - ad)^2g^3(a + bx)} + \frac{d^2 \log(a + bx)\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{90(bc - ad)^3g^3} \\
&= -\frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{180(bc - ad)g^3(a + bx)^2} + \frac{d\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{90(bc - ad)^2g^3(a + bx)} + \frac{d^2 \log(a + bx)\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{90(bc - ad)^3g^3} \\
&= -\frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{180(bc - ad)g^3(a + bx)^2} + \frac{d\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{90(bc - ad)^2g^3(a + bx)} + \frac{d^2 \log(a + bx)\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{90(bc - ad)^3g^3} \\
&= -\frac{B\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{180(bc - ad)g^3(a + bx)^2} + \frac{Bd\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{30(bc - ad)^2g^3(a + bx)} + \frac{Bd^2 \log(a + bx)\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{30(bc - ad)^3g^3} \\
&= -\frac{B\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{180(bc - ad)g^3(a + bx)^2} + \frac{Bd\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{30(bc - ad)^2g^3(a + bx)} + \frac{Bd^2 \log(a + bx)\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{30(bc - ad)^3g^3} \\
&= -\frac{B^2d^2 \log(a + bx) \log^2\left(\frac{e(a+bx)}{c+dx}\right)}{90(bc - ad)^3g^3} - \frac{B\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{180(bc - ad)g^3(a + bx)^2} + \frac{Bd\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{30(bc - ad)^2g^3(a + bx)} \\
&= -\frac{B^2}{360(bc - ad)g^3(a + bx)^2} + \frac{7B^2d}{180(bc - ad)^2g^3(a + bx)} + \frac{7B^2d^2 \log(a + bx)}{180(bc - ad)^3g^3} - \frac{B^2d^2 \log\left(\frac{e(a+bx)}{c+dx}\right)}{90(bc - ad)^3g^3} \\
&= -\frac{B^2}{360(bc - ad)g^3(a + bx)^2} + \frac{7B^2d}{180(bc - ad)^2g^3(a + bx)} + \frac{7B^2d^2 \log(a + bx)}{180(bc - ad)^3g^3} - \frac{ABd^2 \log^2\left(\frac{e(a+bx)}{c+dx}\right)}{90(bc - ad)^3g^3} \\
&= -\frac{B^2}{360(bc - ad)g^3(a + bx)^2} + \frac{7B^2d}{180(bc - ad)^2g^3(a + bx)} + \frac{7B^2d^2 \log(a + bx)}{180(bc - ad)^3g^3} - \frac{ABd^2 \log^2\left(\frac{e(a+bx)}{c+dx}\right)}{90(bc - ad)^3g^3}
\end{aligned}$$

**Mathematica [A]** time = 1.13258, size = 318, normalized size = 0.93

$$-6B(-2a^2Ad^2 - 4abd(Adx + B(c + dx)) + b^2(B(c^2 - 2cdx - 3d^2x^2) - 2Ad^2x^2)) \log^2\left(\frac{e(a+bx)}{c+dx}\right) - 6d^2(2A^2 + 6AB + 7B^2)$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))^2/((a\*g + b\*g\*x)^3\*(c\*i + d\*i\*x)), x]

[Out] (-3\*(2\*A^2 + 2\*A\*B + B^2)\*(b\*c - a\*d)^2 + 6\*(2\*A^2 + 6\*A\*B + 7\*B^2)\*d\*(b\*c - a\*d)\*(a + b\*x) + 6\*(2\*A^2 + 6\*A\*B + 7\*B^2)\*d^2\*(a + b\*x)^2\*Log[a + b\*x] - 6\*B\*(b\*c - a\*d)\*(-6\*a\*A\*d - 7\*a\*B\*d + b\*B\*(c - 6\*d\*x) + 2\*A\*b\*(c - 2\*d\*x))\*Log[(e\*(a + b\*x))/(c + d\*x)] - 6\*B\*(-2\*a^2\*A\*d^2 - 4\*a\*b\*d\*(A\*d\*x + B\*(c + d\*x)) + b^2\*(-2\*A\*d^2\*x^2 + B\*(c^2 - 2\*c\*d\*x - 3\*d^2\*x^2)))\*Log[(e\*(a + b\*x))/(c + d\*x)]^2 + 4\*B^2\*d^2\*(a + b\*x)^2\*Log[(e\*(a + b\*x))/(c + d\*x)]^3 - 6\*(2\*A^2 + 6\*A\*B + 7\*B^2)\*d^2\*(a + b\*x)^2\*Log[c + d\*x]/(12\*(b\*c - a\*d)^3\*g^3\*i\*(a + b\*x)^2)

**Maple [B]** time = 0.059, size = 2144, normalized size = 6.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^3/(d\*i\*x+c\*i), x)

[Out] -1/3\*d^3/i/(a\*d-b\*c)^4/g^3\*B^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))^3\*a+4\*e\*d/i/(a\*d-b\*c)^4/g^3\*A\*B\*b^2/(b\*e/d+e/(d\*x+c)\*a-e/d/(d\*x+c)\*b\*c)\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))\*c-2\*e\*d^2/i/(a\*d-b\*c)^4/g^3\*A^2\*b/(b\*e/d+e/(d\*x+c)\*a-e/d/(d\*x+c)\*b\*c)\*a-1/2\*e^2/i/(a\*d-b\*c)^4/g^3\*B^2\*b^3/(b\*e/d+e/(d\*x+c)\*a-e/d/(d\*x+c)\*b\*c)^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))^2\*c-1/2\*e^2/i/(a\*d-b\*c)^4/g^3\*B^2\*b^3/(b\*e/d+e/(d\*x+c)\*a-e/d/(d\*x+c)\*b\*c)^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))\*c-d^3/i/(a\*d-b\*c)^4/g^3\*A^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))\*a+1/2\*e^2\*d/i/(a\*d-b\*c)^4/g^3\*B^2\*b^2/(b\*e/d+e/(d\*x+c)\*a-e/d/(d\*x+c)\*b\*c)^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))\*a+1/2\*e^2\*d/i/(a\*d-b\*c)^4/g^3\*A\*B\*b^2/(b\*e/d+e/(d\*x+c)\*a-e/d/(d\*x+c)\*b\*c)\*a+4\*e\*d^2/i/(a\*d-b\*c)^4/g^3\*A\*B\*b/(b\*e/d+e/(d\*x+c)\*a-e/d/(d\*x+c)\*b\*c)\*a+4\*e\*d/i/(a\*d-b\*c)^4/g^3\*A\*B\*b^2/(b\*e/d+e/(d\*x+c)\*a-e/d/(d\*x+c)\*b\*c)\*c-e^2/i/(a\*d-b\*c)^4/g^3\*A\*B\*b^3/(b\*e/d+e/(d\*x+c)\*a-e/d/(d\*x+c)\*b\*c)^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))\*c-2\*e\*d^2/i/(a\*d-b\*c)^4/g^3\*B^2\*b/(b\*e/d+e/(d\*x+c)\*a-e/d/(d\*x+c)\*b\*c)\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))^2\*a+2\*e\*d/i

$$\begin{aligned} & / (a*d-b*c)^4/g^3*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*\ln(b*e/d+(a*d- \\ & b*c)*e/d/(d*x+c))^2*c-4*e*d^2/i/(a*d-b*c)^4/g^3*B^2*b/(b*e/d+e/(d*x+c)*a-e/ \\ & d/(d*x+c)*b*c)*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+4*e*d/i/(a*d-b*c)^4/g^3*B^ \\ & 2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c \\ & +1/2*e^2*d/i/(a*d-b*c)^4/g^3*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2* \\ & \ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+4*e*d/i/(a*d-b*c)^4/g^3*B^2*b^2/(b*e/d+ \\ & e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c-1/2*e^2/i/(a*d-b*c)^4/g^3*A*B*b^3/(b*e/d+e/(d*x \\ & +c)*a-e/d/(d*x+c)*b*c)^2*c-4*e*d^2/i/(a*d-b*c)^4/g^3*B^2*b/(b*e/d+e/(d*x \\ & +c)*a-e/d/(d*x+c)*b*c)*a+1/2*e^2*d/i/(a*d-b*c)^4/g^3*A^2*b^2/(b*e/d+e/(d*x+ \\ & c)*a-e/d/(d*x+c)*b*c)^2*a+1/4*e^2*d/i/(a*d-b*c)^4/g^3*B^2*b^2/(b*e/d+e/(d*x \\ & +c)*a-e/d/(d*x+c)*b*c)^2*a+2*e*d/i/(a*d-b*c)^4/g^3*A^2*b^2/(b*e/d+e/(d*x+c) \\ & *a-e/d/(d*x+c)*b*c)*c+e^2*d/i/(a*d-b*c)^4/g^3*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/ \\ & d/(d*x+c)*b*c)^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-4*e*d^2/i/(a*d-b*c)^4/g^ \\ & 3*A*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)) \\ & *a-d^3/i/(a*d-b*c)^4/g^3*A*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a-1/2*e^2/i/ \\ & (a*d-b*c)^4/g^3*A^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c+d^2/i/(a*d- \\ & b*c)^4/g^3*A*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b*c+1/3*d^2/i/(a*d-b*c)^4/ \\ & g^3*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*b*c+d^2/i/(a*d-b*c)^4/g^3*A^2*\ln( \\ & b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c-1/4*e^2/i/(a*d-b*c)^4/g^3*B^2*b^3/(b*e/d+e \\ & / (d*x+c)*a-e/d/(d*x+c)*b*c)^2*c \end{aligned}$$

**Maxima [B]** time = 2.12, size = 2855, normalized size = 8.32

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3/(d*i*x+c*i),x, algo
rithm="maxima")
```

```
[Out] 1/2*B^2*((2*b*d*x - b*c + 3*a*d)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3
*i*x^2 + 2*(a*b^3*c^2 - 2*a^2*b^2*c*d + a^3*b*d^2)*g^3*i*x + (a^2*b^2*c^2 -
2*a^3*b*c*d + a^4*d^2)*g^3*i) + 2*d^2*log(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2
*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i) - 2*d^2*log(d*x + c)/((b^3*c^3 - 3*a*b
^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i))*log(b*e*x/(d*x + c) + a*e/(d*x
+ c))^2 + A*B*((2*b*d*x - b*c + 3*a*d)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^
2)*g^3*i*x^2 + 2*(a*b^3*c^2 - 2*a^2*b^2*c*d + a^3*b*d^2)*g^3*i*x + (a^2*b^2
*c^2 - 2*a^3*b*c*d + a^4*d^2)*g^3*i) + 2*d^2*log(b*x + a)/((b^3*c^3 - 3*a*b
^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i) - 2*d^2*log(d*x + c)/((b^3*c^3 -
3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i))*log(b*e*x/(d*x + c) + a*e
/(d*x + c)) - 1/12*B^2*(6*(b^2*c^2 - 8*a*b*c*d + 7*a^2*d^2 + 2*(b^2*d^2*x^2
+ 2*a*b*d^2*x + a^2*d^2)*log(b*x + a)^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a
```



$$\begin{aligned} & ^2d^2) \log(dx + c)^2 - 6(b^2cd - ab^2d^2)x - 6(b^2d^2x^2 + 2ab^2d^2x + a^2d^2) \log(bx + a) + 2(3b^2d^2x^2 + 6ab^2d^2x + 3a^2d^2 - \\ & 2(b^2d^2x^2 + 2ab^2d^2x + a^2d^2) \log(bx + a)) \log(dx + c) \log(bx + a) / (dx + c) + a e / (dx + c) / (a^2b^3c^3g^3i - 3a^3b^2c^2d^2g^3i + \\ & 3a^4b^2cd^2g^3i - a^5d^3g^3i + (b^5c^3g^3i - 3a^4b^2c^2d^2g^3i + 3a^2b^3cd^2g^3i - a^3b^2d^3g^3i) x^2 + 2(ab^4c^3g^3i - 3a^2b^3c^2d^2g^3i + \\ & 3a^3b^2cd^2g^3i - a^4b^2d^3g^3i) x) + (3b^2c^2 - 48abc^2d + 45a^2d^2 - 4(b^2d^2x^2 + 2ab^2d^2x + a^2d^2) \log(bx + a)^3 + \\ & 4(b^2d^2x^2 + 2ab^2d^2x + a^2d^2) \log(dx + c)^3 + 18(b^2d^2x^2 + 2ab^2d^2x + a^2d^2) \log(bx + a)^2 + 6(3b^2d^2x^2 + 6ab^2d^2x + \\ & 3a^2d^2 - 2(b^2d^2x^2 + 2ab^2d^2x + a^2d^2) \log(bx + a)) \log(dx + c)^2 - 42(b^2cd - ab^2d^2)x - 42(b^2d^2x^2 + 2ab^2d^2x + \\ & a^2d^2) \log(bx + a) + 6(7b^2d^2x^2 + 14ab^2d^2x + 7a^2d^2 + 2(b^2d^2x^2 + 2ab^2d^2x + a^2d^2) \log(bx + a)^2 - 6(b^2d^2x^2 + 2ab^2d^2x + \\ & a^2d^2) \log(bx + a)) \log(dx + c) / (a^2b^3c^3g^3i - 3a^3b^2c^2d^2g^3i + 3a^4b^2cd^2g^3i - a^5d^3g^3i + (b^5c^3g^3i - 3a^4b^2c^2d^2g^3i + \\ & 3a^2b^3cd^2g^3i - a^3b^2d^3g^3i) x^2 + 2(ab^4c^3g^3i - 3a^2b^3c^2d^2g^3i + 3a^3b^2cd^2g^3i - a^4b^2d^3g^3i) x) + 1/2 A^2 ((2bdx - bc + 3ad) / ((b^4c^2 - 2ab^3cd + a^2b^2d^2) g^3i x^2 + \\ & 2(ab^3c^2 - 2a^2b^2cd + a^3bd^2) g^3i x + (a^2b^2c^2 - 2a^3bcd + a^4d^2) g^3i) + 2d^2 \log(bx + a) / ((b^3c^3 - 3a^2b^2c^2d + 3a^2b^2cd^2 - a^3d^3) g^3i) - \\ & 2d^2 \log(dx + c) / ((b^3c^3 - 3a^2b^2c^2d + 3a^2b^2cd^2 - a^3d^3) g^3i) - 1/2 (b^2c^2 - 8abc^2d + 7a^2d^2 + 2(b^2d^2x^2 + 2ab^2d^2x + a^2d^2) \log(bx + a)^2 + \\ & 2(b^2d^2x^2 + 2ab^2d^2x + a^2d^2) \log(dx + c)^2 - 6(b^2cd - ab^2d^2)x - 6(b^2d^2x^2 + 2ab^2d^2x + a^2d^2) \log(bx + a) + 2(3b^2d^2x^2 + 6ab^2d^2x + \\ & 3a^2d^2 - 2(b^2d^2x^2 + 2ab^2d^2x + a^2d^2) \log(bx + a)) \log(dx + c) A B / (a^2b^3c^3g^3i - 3a^3b^2c^2d^2g^3i + 3a^4b^2cd^2g^3i - a^5d^3g^3i + (b^5c^3g^3i - 3a^4b^2c^2d^2g^3i + \\ & 3a^2b^3cd^2g^3i - a^3b^2d^3g^3i) x^2 + 2(ab^4c^3g^3i - 3a^2b^3c^2d^2g^3i + 3a^3b^2cd^2g^3i - a^4b^2d^3g^3i) x) \end{aligned}$$

**Fricas [A]** time = 0.527888, size = 1130, normalized size = 3.29

$$3(2A^2 + 2AB + B^2)b^2c^2 - 24(A^2 + 2AB + 2B^2)abcd + 3(6A^2 + 14AB + 15B^2)a^2d^2 - 4(B^2b^2d^2x^2 + 2B^2abd^2x +$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^3/(d\*i\*x+c\*i),x, algorithm="fricas")

```
[Out] -1/12*(3*(2*A^2 + 2*A*B + B^2)*b^2*c^2 - 24*(A^2 + 2*A*B + 2*B^2)*a*b*c*d +
3*(6*A^2 + 14*A*B + 15*B^2)*a^2*d^2 - 4*(B^2*b^2*d^2*x^2 + 2*B^2*a*b*d^2*x
+ B^2*a^2*d^2)*log((b*e*x + a*e)/(d*x + c))^3 - 6*((2*A*B + 3*B^2)*b^2*d^2
*x^2 - B^2*b^2*c^2 + 4*B^2*a*b*c*d + 2*A*B*a^2*d^2 + 2*(B^2*b^2*c*d + 2*(A*
B + B^2)*a*b*d^2)*x)*log((b*e*x + a*e)/(d*x + c))^2 - 6*((2*A^2 + 6*A*B + 7
*B^2)*b^2*c*d - (2*A^2 + 6*A*B + 7*B^2)*a*b*d^2)*x - 6*((2*A^2 + 6*A*B + 7*
B^2)*b^2*d^2*x^2 + 2*A^2*a^2*d^2 - (2*A*B + B^2)*b^2*c^2 + 8*(A*B + B^2)*a*
b*c*d + 2*((2*A*B + 3*B^2)*b^2*c*d + 2*(A^2 + 2*A*B + 2*B^2)*a*b*d^2)*x)*lo
g((b*e*x + a*e)/(d*x + c)))/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a
^3*b^2*d^3)*g^3*i*x^2 + 2*(a*b^4*c^3 - 3*a^2*b^3*c^2*d + 3*a^3*b^2*c*d^2 -
a^4*b*d^3)*g^3*i*x + (a^2*b^3*c^3 - 3*a^3*b^2*c^2*d + 3*a^4*b*c*d^2 - a^5*d
^3)*g^3*i)
```

---

**Sympy [B]** time = 12.3273, size = 1488, normalized size = 4.34

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**3/(d*i*x+c*i),x)
```

```
[Out] -B**2*d**2*log(e*(a + b*x)/(c + d*x))**3/(3*a**3*d**3*g**3*i - 9*a**2*b*c*d
**2*g**3*i + 9*a*b**2*c**2*d*g**3*i - 3*b**3*c**3*g**3*i) + d**2*(2*A**2 +
6*A*B + 7*B**2)*log(x + (2*A**2*a*d**3 + 2*A**2*b*c*d**2 + 6*A*B*a*d**3 + 6
*A*B*b*c*d**2 + 7*B**2*a*d**3 + 7*B**2*b*c*d**2 - a**4*d**6*(2*A**2 + 6*A*B
+ 7*B**2)/(a*d - b*c)**3 + 4*a**3*b*c*d**5*(2*A**2 + 6*A*B + 7*B**2)/(a*d
- b*c)**3 - 6*a**2*b**2*c**2*d**4*(2*A**2 + 6*A*B + 7*B**2)/(a*d - b*c)**3
+ 4*a*b**3*c**3*d**3*(2*A**2 + 6*A*B + 7*B**2)/(a*d - b*c)**3 - b**4*c**4*d
**2*(2*A**2 + 6*A*B + 7*B**2)/(a*d - b*c)**3)/(4*A**2*b*d**3 + 12*A*B*b*d**
3 + 14*B**2*b*d**3))/(2*g**3*i*(a*d - b*c)**3) - d**2*(2*A**2 + 6*A*B + 7*B
**2)*log(x + (2*A**2*a*d**3 + 2*A**2*b*c*d**2 + 6*A*B*a*d**3 + 6*A*B*b*c*d*
*2 + 7*B**2*a*d**3 + 7*B**2*b*c*d**2 + a**4*d**6*(2*A**2 + 6*A*B + 7*B**2)/
(a*d - b*c)**3 - 4*a**3*b*c*d**5*(2*A**2 + 6*A*B + 7*B**2)/(a*d - b*c)**3 +
6*a**2*b**2*c**2*d**4*(2*A**2 + 6*A*B + 7*B**2)/(a*d - b*c)**3 - 4*a*b**3*
c**3*d**3*(2*A**2 + 6*A*B + 7*B**2)/(a*d - b*c)**3 + b**4*c**4*d**2*(2*A**2
+ 6*A*B + 7*B**2)/(a*d - b*c)**3)/(4*A**2*b*d**3 + 12*A*B*b*d**3 + 14*B**2
*b*d**3))/(2*g**3*i*(a*d - b*c)**3) + (6*A*B*a*d - 2*A*B*b*c + 4*A*B*b*d*x
+ 7*B**2*a*d - B**2*b*c + 6*B**2*b*d*x)*log(e*(a + b*x)/(c + d*x))/(2*a**4*
d**2*g**3*i - 4*a**3*b*c*d*g**3*i + 4*a**3*b*d**2*g**3*i*x + 2*a**2*b**2*c*
*2*g**3*i - 8*a**2*b**2*c*d*g**3*i*x + 2*a**2*b**2*d**2*g**3*i*x**2 + 4*a*b
**3*c**2*g**3*i*x - 4*a*b**3*c*d*g**3*i*x**2 + 2*b**4*c**2*g**3*i*x**2) + (
-2*A*B*a**2*d**2 - 4*A*B*a*b*d**2*x - 2*A*B*b**2*d**2*x**2 - 4*B**2*a*b*c*d
```

```

- 4*B**2*a*b*d**2*x + B**2*b**2*c**2 - 2*B**2*b**2*c*d*x - 3*B**2*b**2*d**
2*x**2)*log(e*(a + b*x)/(c + d*x))**2/(2*a**5*d**3*g**3*i - 6*a**4*b*c*d**2
*g**3*i + 4*a**4*b*d**3*g**3*i*x + 6*a**3*b**2*c**2*d*g**3*i - 12*a**3*b**2
*c*d**2*g**3*i*x + 2*a**3*b**2*d**3*g**3*i*x**2 - 2*a**2*b**3*c**3*g**3*i +
12*a**2*b**3*c**2*d*g**3*i*x - 6*a**2*b**3*c*d**2*g**3*i*x**2 - 4*a*b**4*c
**3*g**3*i*x + 6*a*b**4*c**2*d*g**3*i*x**2 - 2*b**5*c**3*g**3*i*x**2) + (6*
A**2*a*d - 2*A**2*b*c + 14*A*B*a*d - 2*A*B*b*c + 15*B**2*a*d - B**2*b*c + x
*(4*A**2*b*d + 12*A*B*b*d + 14*B**2*b*d))/(4*a**4*d**2*g**3*i - 8*a**3*b*c*
d*g**3*i + 4*a**2*b**2*c**2*g**3*i + x**2*(4*a**2*b**2*d**2*g**3*i - 8*a*b*
*3*c*d*g**3*i + 4*b**4*c**2*g**3*i) + x*(8*a**3*b*d**2*g**3*i - 16*a**2*b**
2*c*d*g**3*i + 8*a*b**3*c**2*g**3*i))

```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B \log\left(\frac{bx+a}{dx+c}\right) + A\right)^2}{(bgx + ag)^3 (dix + ci)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3/(d*i*x+c*i),x, algor
ithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/((b*g*x + a*g)^3*(d*i*x + c*
i)), x)
```

$$3.91 \quad \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^4(ci+dix)} dx$$

**Optimal.** Leaf size=507

$$-\frac{b^3(c+dx)^3 \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)^2}{3g^4i(a+bx)^3(bc-ad)^4} - \frac{2b^3B(c+dx)^3 \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{9g^4i(a+bx)^3(bc-ad)^4} + \frac{3b^2d(c+dx)^2 \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)^2}{2g^4i(a+bx)^2(bc-ad)^4} + \frac{3b^2B}{3g^4i(a+bx)^3(bc-ad)^4}$$

[Out]  $(-6*b*B^2*d^2*(c+d*x))/((b*c-a*d)^4*g^4*i*(a+b*x)) + (3*b^2*B^2*d*(c+d*x)^2)/(4*(b*c-a*d)^4*g^4*i*(a+b*x)^2) - (2*b^3*B^2*(c+d*x)^3)/(27*(b*c-a*d)^4*g^4*i*(a+b*x)^3) - (6*b*B*d^2*(c+d*x)*(A+B*Log[(e*(a+b*x))/(c+d*x)]))/((b*c-a*d)^4*g^4*i*(a+b*x)) + (3*b^2*B*d*(c+d*x)^2*(A+B*Log[(e*(a+b*x))/(c+d*x)]))/(2*(b*c-a*d)^4*g^4*i*(a+b*x)^2) - (2*b^3*B*(c+d*x)^3*(A+B*Log[(e*(a+b*x))/(c+d*x)]))/(9*(b*c-a*d)^4*g^4*i*(a+b*x)^3) - (3*b*d^2*(c+d*x)*(A+B*Log[(e*(a+b*x))/(c+d*x)]))^2/((b*c-a*d)^4*g^4*i*(a+b*x)) + (3*b^2*d*(c+d*x)^2*(A+B*Log[(e*(a+b*x))/(c+d*x)]))^2/(2*(b*c-a*d)^4*g^4*i*(a+b*x)^2) - (b^3*(c+d*x)^3*(A+B*Log[(e*(a+b*x))/(c+d*x)]))^2/(3*(b*c-a*d)^4*g^4*i*(a+b*x)^3) - (d^3*(A+B*Log[(e*(a+b*x))/(c+d*x)]))^3/(3*B*(b*c-a*d)^4*g^4*i)$

**Rubi [C]** time = 8.43056, antiderivative size = 2044, normalized size of antiderivative = 4.03, number of steps used = 151, number of rules used = 31, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.738$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2/((a\*g + b\*g\*x)^4\*(c\*i + d\*i\*x)), x]

[Out]  $(-2*B^2)/(27*(b*c-a*d)*g^4*i*(a+b*x)^3) + (19*B^2*d)/(36*(b*c-a*d)^2*g^4*i*(a+b*x)^2) - (85*B^2*d^2)/(18*(b*c-a*d)^3*g^4*i*(a+b*x)) - (85*B^2*d^3*Log[a+b*x])/((18*(b*c-a*d)^4*g^4*i) + (A*B*d^3*Log[a+b*x]^2)/((b*c-a*d)^4*g^4*i) + (11*B^2*d^3*Log[a+b*x]^2)/(6*(b*c-a*d)^4*g^4*i) - (B^2*d^3*Log[a+b*x]*Log[(c+d*x)^(-1)]^2)/((b*c-a*d)^4*g^4*i) + (B^2*d^3*Log[-((d*(a+b*x))/(b*c-a*d))]*Log[(c+d*x)^(-1)]^2)/((b*c-a*d)^4*g^4*i)$

$$\begin{aligned}
& 4*g^{4*i} + (B^2*d^3*\text{Log}[-((b*c - a*d)/(d*(a + b*x)))]*\text{Log}[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^4*g^{4*i} + (B^2*d^3*\text{Log}[a + b*x]*\text{Log}[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^4*g^{4*i} - (2*B*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])))/(9*(b*c - a*d)*g^{4*i}*(a + b*x)^3 + (5*B*d*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])))/(6*(b*c - a*d)^2*g^{4*i}*(a + b*x)^2 - (11*B*d^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])))/(3*(b*c - a*d)^3*g^{4*i}*(a + b*x) - (11*B*d^3*\text{Log}[a + b*x]*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])))/(3*(b*c - a*d)^4*g^{4*i} - (A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]^2)/(3*(b*c - a*d)*g^{4*i}*(a + b*x)^3 + (d*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]^2)/(2*(b*c - a*d)^2*g^{4*i}*(a + b*x)^2 - (d^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^3*g^{4*i}*(a + b*x)) - (d^3*\text{Log}[a + b*x]*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^4*g^{4*i} + (85*B^2*d^3*\text{Log}[c + d*x])/(18*(b*c - a*d)^4*g^{4*i} - (B^2*d^3*\text{Log}[a + b*x]^2*\text{Log}[c + d*x])/(b*c - a*d)))*\text{Log}[c + d*x])/(b*c - a*d)^4*g^{4*i} - (11*B^2*d^3*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/(3*(b*c - a*d)^4*g^{4*i} - (2*B^2*d^3*\text{Log}[a + b*x]*\text{Log}[(c + d*x)^{-1}]*\text{Log}[c + d*x])/(b*c - a*d)^4*g^{4*i} + (2*B^2*d^3*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*(\text{Log}[a + b*x] + \text{Log}[(c + d*x)^{-1}] - \text{Log}[(e*(a + b*x))/(c + d*x]))*\text{Log}[c + d*x])/(b*c - a*d)^4*g^{4*i} + (11*B*d^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x]))*\text{Log}[c + d*x])/(3*(b*c - a*d)^4*g^{4*i} + (d^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x]))^2*\text{Log}[c + d*x])/(b*c - a*d)^4*g^{4*i} + (A*B*d^3*\text{Log}[c + d*x]^2)/((b*c - a*d)^4*g^{4*i} + (11*B^2*d^3*\text{Log}[c + d*x]^2)/(6*(b*c - a*d)^4*g^{4*i} - (B^2*d^3*\text{Log}[a + b*x]*\text{Log}[c + d*x]^2)/((b*c - a*d)^4*g^{4*i} + (B^2*d^3*\text{Log}[(e*(a + b*x))/(c + d*x)]*\text{Log}[c + d*x]^2)/((b*c - a*d)^4*g^{4*i} + (B^2*d^3*\text{Log}[c + d*x]^3)/(3*(b*c - a*d)^4*g^{4*i} - (2*A*B*d^3*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^{4*i} - (11*B^2*d^3*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^{4*i} + (B^2*d^3*\text{Log}[a + b*x]^2*\text{Log}[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^{4*i} - (2*A*B*d^3*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))])/(b*c - a*d)^4*g^{4*i} - (11*B^2*d^3*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))])/(3*(b*c - a*d)^4*g^{4*i} + (2*B^2*d^3*\text{Log}[a + b*x]*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))])/(b*c - a*d)^4*g^{4*i} - (2*A*B*d^3*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^{4*i} - (11*B^2*d^3*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^{4*i} - (2*B^2*d^3*\text{Log}[(c + d*x)^{-1}]*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^{4*i} + (2*B^2*d^3*(\text{Log}[a + b*x] + \text{Log}[(c + d*x)^{-1}] - \text{Log}[(e*(a + b*x))/(c + d*x]))*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^{4*i} - (2*B^2*d^3*\text{Log}[(e*(a + b*x))/(c + d*x)]*\text{PolyLog}[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(b*c - a*d)^4*g^{4*i} - (2*B^2*d^3*\text{PolyLog}[3, -((d*(a + b*x))/(b*c - a*d))])/(b*c - a*d)^4*g^{4*i} - (2*B^2*d^3*\text{PolyLog}[3, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^{4*i} - (2*B^2*d^3*\text{PolyLog}[3, 1 + (b*c - a*d)/(d*(a + b*x))])/(b*c - a*d)^4*g^{4*i}
\end{aligned}$$

### Rule 2528

`Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With`

```
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
```

qQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] := Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n]))/g, x] - Dist[(b\*e^n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] := -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rule 6688

Int[u\_, x\_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifierIntegrandQ[v, u, x]]

### Rule 6742

Int[u\_, x\_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]

### Rule 2411

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^p\_)\*((f\_.) + (g\_.)\*(x\_))^(q\_.)\*((h\_.) + (i\_.)\*(x\_))^(r\_.), x\_Symbol] := Dist[1/e, Subst[Int[((g\*x)/e)^q\*((e\*h - d\*i)/e + (i\*x)/e)^r\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e\*f - d\*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2\*r]

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
  x_Symbol] := Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] := Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
  Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] := With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
h*x)^t]^u)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s + 1))/(p*r*(s + 1)*(b*c
- a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q]^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] := -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q]^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] := With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```



Rule 6610

Int[(u\_)\*PolyLog[n\_, v\_], x\_Symbol] := With[{w = DerivativeDivides[v, u\*v, x]}, Simp[w\*PolyLog[n + 1, v], x] /; !FalseQ[w]] /; FreeQ[n, x]

Rule 2500

Int[(Log[(e\_)\*((f\_)\*(a\_) + (b\_)\*(x\_))^(p\_))\*((c\_) + (d\_)\*(x\_))^(q\_)]^(r\_)]\*((s\_) + Log[(i\_)\*(g\_) + (h\_)\*(x\_)]^(n\_)]\*(t\_)))/((j\_) + (k\_)\*(x\_)), x\_Symbol] := Dist[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q)^r] - Log[(a + b\*x)^(p\*r)] - Log[(c + d\*x)^(q\*r)], Int[(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x], x] + (Int[(Log[(a + b\*x)^(p\*r)]\*(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x] + Int[(Log[(c + d\*x)^(q\*r)]\*(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0]

Rule 2433

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_))^(n\_)]\*(b\_))^(p\_))\*((f\_) + Log[(h\_)\*((i\_) + (j\_)\*(x\_))^(m\_)]\*(g\_))\*((k\_) + (l\_)\*(x\_))^(r\_), x\_Symbol] := Dist[1/e, Subst[Int[((k\*x)/d)^r\*(a + b\*Log[c\*x^n])^p\*(f + g\*Log[h\*(e\*i - d\*j)/e + (j\*x)/e]^m)], x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e\*k - d\*1, 0]

Rule 2375

Int[(Log[(d\_)\*((e\_) + (f\_)\*(x\_))^(m\_))]^(r\_))\*((a\_) + Log[(c\_)\*(x\_)]^(n\_))\*((b\_))^(p\_)]/(x\_), x\_Symbol] := Simp[(Log[d\*(e + f\*x^m)^r]\*(a + b\*Log[c\*x^n])^(p + 1))/(b\*n\*(p + 1)), x] - Dist[(f\*m\*r)/(b\*n\*(p + 1)), Int[(x^(m - 1)\*(a + b\*Log[c\*x^n])^(p + 1))/(e + f\*x^m), x], x] /; FreeQ[{a, b, c, d, e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d\*e, 1]

Rule 2374

Int[(Log[(d\_)\*((e\_) + (f\_)\*(x\_))^(m\_))]\*((a\_) + Log[(c\_)\*(x\_)]^(n\_))\*((b\_))^(p\_)]/(x\_), x\_Symbol] := -Simp[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^p)/m, x] + Dist[(b\*n\*p)/m, Int[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0] && EqQ[d\*e, 1]

Rule 6589

Int[PolyLog[n\_, (c\_)\*((a\_) + (b\_)\*(x\_))^(p\_)]/((d\_) + (e\_)\*(x\_)), x\_Symbol] := Simp[PolyLog[n + 1, c\*(a + b\*x)^p]/(e\*p), x] /; FreeQ[{a, b, c, d

, e, n, p}, x] && EqQ[b\*d, a\*e]

### Rule 2440

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))\*((f\_.) + Log[(h\_.) \*((i\_.) + (j\_.)\*(x\_))^(m\_.)]\*(g\_.))\*((k\_) + (l\_.)\*(x\_))^(r\_.), x\_Symbol] :> Dist[1/l, Subst[Int[x^r\*(a + b\*Log[c\*(-((e\*k - d\*l)/l) + (e\*x)/l)^n])\*(f + g\*Log[h\*(-((j\*k - i\*l)/l) + (j\*x)/l)^m]), x], x, k + l\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]

### Rule 2434

Int[(((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))\*((f\_.) + Log[(h\_.) \*((i\_.) + (j\_.)\*(x\_))^(m\_.)]\*(g\_.)))/(x\_), x\_Symbol] :> Simp[Log[x]\*(a + b\*Log[c\*(d + e\*x)^n])\*(f + g\*Log[h\*(i + j\*x)^m]), x] + (-Dist[e\*g\*m, Int[(Log[x]\*(a + b\*Log[c\*(d + e\*x)^n])]/(d + e\*x), x], x] - Dist[b\*j\*n, Int[(Log[x]\*(f + g\*Log[h\*(i + j\*x)^m])]/(i + j\*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, m, n}, x] && EqQ[e\*i - d\*j, 0]

### Rule 2499

Int[(Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.) )^(r\_.)]\*(((s\_.) + Log[(i\_.)\*((g\_.) + (h\_.)\*(x\_))^(n\_.)]\*(t\_.))^(m\_.))/(j\_.) + (k\_.)\*(x\_)), x\_Symbol] :> Simp[((s + t\*Log[i\*(g + h\*x)^n])^(m + 1)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r)/(k\*n\*t\*(m + 1)), x] + (-Dist[(b\*p\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(a + b\*x), x], x] - Dist[(d\*q\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(c + d\*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0] && EqQ[h\*j - g\*k, 0] && IGtQ[m, 0]

### Rule 2396

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_)/((f\_.) + (g\_.) \* (x\_)), x\_Symbol] :> Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])^p)/g, x] - Dist[(b\*e\*n\*p)/g, Int[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])^(p - 1))/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p}, x] && NeQ[e\*f - d\*g, 0] && IGtQ[p, 1]

### Rule 2302

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_)/(x\_), x\_Symbol] :> Dist[1/(b\*n), Subst[Int[x^p, x], x, a + b\*Log[c\*x^n]], x] /; FreeQ[{a, b, c, n, p}, x]

Rule 30

`Int[(x_)^(m_.), x_Symbol] := Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && NeQ[m, -1]`

Rubi steps

$$\begin{aligned}
\int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(91c + 91dx)(ag + bgx)^4} dx &= \int \left( \frac{b\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{91(bc - ad)g^4(a + bx)^4} - \frac{bd\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{91(bc - ad)^2g^4(a + bx)^3} + \frac{bd^2\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{91(bc - ad)^3g^4(a + bx)^2} - \right. \\
&= -\frac{(bd^3) \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx} dx}{91(bc - ad)^4g^4} + \frac{d^4 \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx} dx}{91(bc - ad)^4g^4} + \frac{(bd^2) \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^2} dx}{91(bc - ad)^3g^4} \\
&= -\frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{273(bc - ad)g^4(a + bx)^3} + \frac{d\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{182(bc - ad)^2g^4(a + bx)^2} - \frac{d^2\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{91(bc - ad)^3g^4(a + bx)} - \frac{d^3}{91(bc - ad)^3g^4(a + bx)} \\
&= -\frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{273(bc - ad)g^4(a + bx)^3} + \frac{d\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{182(bc - ad)^2g^4(a + bx)^2} - \frac{d^2\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{91(bc - ad)^3g^4(a + bx)} - \frac{d^3}{91(bc - ad)^3g^4(a + bx)} \\
&= -\frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{273(bc - ad)g^4(a + bx)^3} + \frac{d\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{182(bc - ad)^2g^4(a + bx)^2} - \frac{d^2\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{91(bc - ad)^3g^4(a + bx)} - \frac{d^3}{91(bc - ad)^3g^4(a + bx)} \\
&= -\frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{273(bc - ad)g^4(a + bx)^3} + \frac{d\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{182(bc - ad)^2g^4(a + bx)^2} - \frac{d^2\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{91(bc - ad)^3g^4(a + bx)} - \frac{d^3}{91(bc - ad)^3g^4(a + bx)} \\
&= -\frac{2B\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{819(bc - ad)g^4(a + bx)^3} + \frac{5Bd\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{546(bc - ad)^2g^4(a + bx)^2} - \frac{11Bd^2\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{273(bc - ad)^3g^4(a + bx)} \\
&= -\frac{2B\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{819(bc - ad)g^4(a + bx)^3} + \frac{5Bd\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{546(bc - ad)^2g^4(a + bx)^2} - \frac{11Bd^2\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{273(bc - ad)^3g^4(a + bx)} \\
&= \frac{B^2d^3 \log(a + bx) \log^2\left(\frac{e(a+bx)}{c+dx}\right)}{91(bc - ad)^4g^4} - \frac{2B\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{819(bc - ad)g^4(a + bx)^3} + \frac{5Bd\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{546(bc - ad)^2g^4(a + bx)^2} \\
&= -\frac{2B^2}{2457(bc - ad)g^4(a + bx)^3} + \frac{19B^2d}{3276(bc - ad)^2g^4(a + bx)^2} - \frac{85B^2d^2}{1638(bc - ad)^3g^4(a + bx)} \\
&= -\frac{2B^2}{2457(bc - ad)g^4(a + bx)^3} + \frac{19B^2d}{3276(bc - ad)^2g^4(a + bx)^2} - \frac{85B^2d^2}{1638(bc - ad)^3g^4(a + bx)} \\
&= -\frac{2B^2}{2457(bc - ad)g^4(a + bx)^3} + \frac{19B^2d}{3276(bc - ad)^2g^4(a + bx)^2} - \frac{85B^2d^2}{1638(bc - ad)^3g^4(a + bx)}
\end{aligned}$$

**Mathematica [A]** time = 1.46497, size = 442, normalized size = 0.87

$$18B(18a^2bd^2(Adx + B(c + dx)) + 6a^3Ad^3 + 9ab^2d(2Ad^2x^2 + B(-c^2 + 2cdx + 3d^2x^2))) + b^3(6Ad^3x^3 + B(-3c^2dx + 2$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2/((a\*g + b\*g\*x)^4\*(c\*i + d\*i\*x)), x]

[Out]  $-(4*(9*A^2 + 6*A*B + 2*B^2)*(b*c - a*d)^3 - 3*(18*A^2 + 30*A*B + 19*B^2)*d*(b*c - a*d)^2*(a + b*x) - 6*(18*A^2 + 66*A*B + 85*B^2)*d^2*(-(b*c) + a*d)*(a + b*x)^2 + 6*(18*A^2 + 66*A*B + 85*B^2)*d^3*(a + b*x)^3*\text{Log}[a + b*x] + 6*B*(b*c - a*d)*(4*(3*A + B)*(b*c - a*d)^2 + 3*(6*A + 5*B)*d*(-(b*c) + a*d)*(a + b*x) + 6*(6*A + 11*B)*d^2*(a + b*x)^2)*\text{Log}[(e*(a + b*x))/(c + d*x)] + 18*B*(6*a^3*A*d^3 + 18*a^2*b*d^2*(A*d*x + B*(c + d*x)) + 9*a*b^2*d*(2*A*d^2*x^2 + B*(-c^2 + 2*c*d*x + 3*d^2*x^2)) + b^3*(6*A*d^3*x^3 + B*(2*c^3 - 3*c^2*d*x + 6*c*d^2*x^2 + 11*d^3*x^3)))*\text{Log}[(e*(a + b*x))/(c + d*x)]^2 + 36*B^2*d^3*(a + b*x)^3*\text{Log}[(e*(a + b*x))/(c + d*x)]^3 - 6*(18*A^2 + 66*A*B + 85*B^2)*d^3*(a + b*x)^3*\text{Log}[c + d*x])/(108*(b*c - a*d)^4*g^4*i*(a + b*x)^3)$

**Maple [B]** time = 0.059, size = 3093, normalized size = 6.1

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^4/(d\*i\*x+c\*i), x)

[Out]  $1/3*e^3/i/(a*d-b*c)^5/g^4*A^2*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*c-6*e*d^3/i/(a*d-b*c)^5/g^4*A*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+6*e*d^2/i/(a*d-b*c)^5/g^4*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c-2/9*e^3*d/i/(a*d-b*c)^5/g^4*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*\text{ln}(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+3/2*e^2*d^2/i/(a*d-b*c)^5/g^4*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*\text{ln}(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a-3/2*e^2*d/i/(a*d-b*c)^5/g^4*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*\text{ln}(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c+3/2*e^2*d^2/i/(a*d-b*c)^5/g^4*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*\text{ln}(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-3/2*e^2*d/i/(a*d-b*c)^5/g^4*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*\text{ln}(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-1/3*e^3*d/i/(a*d-b*c)^5/g^4*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*\text{ln}(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a-3*e*d^3/i/(a*d-b*c)^5/g^4*$

$$\begin{aligned}
& B^2 b / (b e / d + e / (d x + c)) a - e / d / (d x + c) b c * \ln(b e / d + (a d - b c) e / d / (d x + c)) ^ 2 \\
& * a + 3 e * d ^ 2 / i / (a d - b c) ^ 5 / g ^ 4 B^2 b^2 / (b e / d + e / (d x + c)) a - e / d / (d x + c) b c * \ln \\
& (b e / d + (a d - b c) e / d / (d x + c)) ^ 2 * c - 6 e * d ^ 3 / i / (a d - b c) ^ 5 / g ^ 4 B^2 b / (b e / d + e / \\
& (d x + c)) a - e / d / (d x + c) b c * \ln(b e / d + (a d - b c) e / d / (d x + c)) * a + 6 e * d ^ 2 / i / (a d \\
& - b c) ^ 5 / g ^ 4 B^2 b^2 / (b e / d + e / (d x + c)) a - e / d / (d x + c) b c * \ln(b e / d + (a d - b c) * \\
& e / d / (d x + c)) * c + 2 / 3 e ^ 3 / i / (a d - b c) ^ 5 / g ^ 4 A * B * b ^ 4 / (b e / d + e / (d x + c)) a - e / d / (d x \\
& + c) b c ^ 3 * \ln(b e / d + (a d - b c) e / d / (d x + c)) * c + 3 / 2 e ^ 2 * d ^ 2 / i / (a d - b c) ^ 5 / g ^ 4 \\
& * A * B * b^2 / (b e / d + e / (d x + c)) a - e / d / (d x + c) b c ^ 2 * a - 3 / 2 e ^ 2 * d / i / (a d - b c) ^ 5 / g ^ 4 \\
& * A * B * b^3 / (b e / d + e / (d x + c)) a - e / d / (d x + c) b c ^ 2 * c - 2 / 9 e ^ 3 * d / i / (a d - b c) ^ 5 / g \\
& ^ 4 * A * B * b^3 / (b e / d + e / (d x + c)) a - e / d / (d x + c) b c ^ 3 * a - 3 / 4 e ^ 2 * d / i / (a d - b c) ^ 5 / \\
& g ^ 4 B^2 b^3 / (b e / d + e / (d x + c)) a - e / d / (d x + c) b c ^ 2 * c - 2 / 27 e ^ 3 * d / i / (a d - b c) ^ 5 / g ^ 4 B^2 b^3 / (b e / d + e / (d x + c)) a - e / d / (d x + c) b c ^ 3 * a + 3 / 2 e ^ 2 * d ^ 2 / i / (a d - b c) ^ 5 / g ^ 4 A^2 b^2 / (b e / d + e / (d x + c)) a - e / d / (d x + c) b c ^ 2 * a - 3 / 2 e ^ 2 * d / i / (a d - b c) ^ 5 / g ^ 4 A^2 b^3 / (b e / d + e / (d x + c)) a - e / d / (d x + c) b c ^ 2 * c - 1 / 3 e ^ 3 * d / i / (a d - b c) ^ 5 / g ^ 4 A^2 b^3 / (b e / d + e / (d x + c)) a - e / d / (d x + c) b c ^ 3 * a + 2 / 9 e ^ 3 / i / (a d - b c) ^ 5 / g ^ 4 B^2 b^4 / (b e / d + e / (d x + c)) a - e / d / (d x + c) b c ^ 3 * \ln(b e / d + (a d - b c) e / d / (d x + c)) * c + d ^ 3 / i / (a d - b c) ^ 5 / g ^ 4 A * B * \ln(b e / d + (a d - b c) e / d / (d x + c)) ^ 2 * b c + 1 / 3 e ^ 3 / i / (a d - b c) ^ 5 / g ^ 4 B^2 b^4 / (b e / d + e / (d x + c)) a - e / d / (d x + c) b c ^ 3 * \ln(b e / d + (a d - b c) e / d / (d x + c)) ^ 2 * c - 1 / 3 d ^ 4 / i / (a d - b c) ^ 5 / g ^ 4 B^2 * \ln(b e / d + (a d - b c) e / d / (d x + c)) ^ 3 * a - d^4 / i / (a d - b c) ^ 5 / g ^ 4 A^2 * \ln(b e / d + (a d - b c) e / d / (d x + c)) * a - 3 e * d ^ 3 / i / (a d - b c) ^ 5 / g ^ 4 A^2 b / (b e / d + e / (d x + c)) a - e / d / (d x + c) b c * a + 3 e * d ^ 2 / i / (a d - b c) ^ 5 / g ^ 4 A^2 b^2 / (b e / d + e / (d x + c)) a - e / d / (d x + c) b c * c - 6 e * d ^ 3 / i / (a d - b c) ^ 5 / g ^ 4 B^2 b / (b e / d + e / (d x + c)) a - e / d / (d x + c) b c * a + 2 / 9 e ^ 3 / i / (a d - b c) ^ 5 / g ^ 4 A * B * b^4 / (b e / d + e / (d x + c)) a - e / d / (d x + c) b c ^ 3 * c + 6 e * d ^ 2 / i / (a d - b c) ^ 5 / g ^ 4 B^2 b^2 / (b e / d + e / (d x + c)) a - e / d / (d x + c) b c * c + 3 / 4 e ^ 2 * d ^ 2 / i / (a d - b c) ^ 5 / g ^ 4 B^2 b^2 / (b e / d + e / (d x + c)) a - e / d / (d x + c) b c ^ 2 * a + 2 / 27 e ^ 3 / i / (a d - b c) ^ 5 / g ^ 4 B^2 b^4 / (b e / d + e / (d x + c)) a - e / d / (d x + c) b c ^ 3 * c - d^4 / i / (a d - b c) ^ 5 / g ^ 4 A * B * \ln(b e / d + (a d - b c) e / d / (d x + c)) ^ 2 * a + 1 / 3 d^3 / i / (a d - b c) ^ 5 / g ^ 4 B^2 * \ln(b e / d + (a d - b c) e / d / (d x + c)) ^ 3 * b c - 2 / 3 e ^ 3 * d / i / (a d - b c) ^ 5 / g ^ 4 A * B * b^3 / (b e / d + e / (d x + c)) a - e / d / (d x + c) b c ^ 3 * \ln(b e / d + (a d - b c) e / d / (d x + c)) * a - 3 e ^ 2 * d / i / (a d - b c) ^ 5 / g ^ 4 A * B * b^3 / (b e / d + e / (d x + c)) a - e / d / (d x + c) b c ^ 2 * \ln(b e / d + (a d - b c) e / d / (d x + c)) * c + 3 e ^ 2 * d ^ 2 / i / (a d - b c) ^ 5 / g ^ 4 A * B * b^2 / (b e / d + e / (d x + c)) a - e / d / (d x + c) b c ^ 2 * \ln(b e / d + (a d - b c) e / d / (d x + c)) * a - 6 e * d ^ 3 / i / (a d - b c) ^ 5 / g ^ 4 A * B * b / (b e / d + e / (d x + c)) a - e / d / (d x + c) b c * \ln(b e / d + (a d - b c) e / d / (d x + c)) * a + 6 e * d ^ 2 / i / (a d - b c) ^ 5 / g ^ 4 A * B * b^2 / (b e / d + e / (d x + c)) a - e / d / (d x + c) b c * \ln(b e / d + (a d - b c) e / d / (d x + c)) * c + d^3 / i / (a d - b c) ^ 5 / g ^ 4 A^2 * \ln(b e / d + (a d - b c) e / d / (d x + c)) * b c
\end{aligned}$$


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**Maxima [B]** time = 2.77982, size = 4636, normalized size = 9.14

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^4/(d\*i\*x+c\*i),x, algorithm="maxima")

[Out] 
$$-1/6*B^2*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^4*i*x^3 + 3*(a*b^5*c^3 - 3*a^2*b^4*c^2*d + 3*a^3*b^3*c*d^2 - a^4*b^2*d^3)*g^4*i*x^2 + 3*(a^2*b^4*c^3 - 3*a^3*b^3*c^2*d + 3*a^4*b^2*c*d^2 - a^5*b*d^3)*g^4*i*x + (a^3*b^3*c^3 - 3*a^4*b^2*c^2*d + 3*a^5*b*c*d^2 - a^6*d^3)*g^4*i) + 6*d^3*log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^4*i) - 6*d^3*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^4*i))*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2 - 1/3*A*B*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^4*i*x^3 + 3*(a*b^5*c^3 - 3*a^2*b^4*c^2*d + 3*a^3*b^3*c*d^2 - a^4*b^2*d^3)*g^4*i*x^2 + 3*(a^2*b^4*c^3 - 3*a^3*b^3*c^2*d + 3*a^4*b^2*c*d^2 - a^5*b*d^3)*g^4*i*x + (a^3*b^3*c^3 - 3*a^4*b^2*c^2*d + 3*a^5*b*c*d^2 - a^6*d^3)*g^4*i) + 6*d^3*log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^4*i) - 6*d^3*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^4*i))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 1/108*B^2*(6*(4*b^3*c^3 - 27*a*b^2*c^2*d + 108*a^2*b*c*d^2 - 85*a^3*d^3 + 66*(b^3*c*d^2 - a*b^2*d^3)*x^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a)^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(d*x + c)^2 - 3*(5*b^3*c^2*d - 54*a*b^2*c*d^2 + 49*a^2*b*d^3)*x + 66*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a) - 6*(11*b^3*d^3*x^3 + 33*a*b^2*d^3*x^2 + 33*a^2*b*d^3*x + 11*a^3*d^3 - 6*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a))*log(d*x + c))*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(a^3*b^4*c^4*g^4*i - 4*a^4*b^3*c^3*d*g^4*i + 6*a^5*b^2*c^2*d^2*g^4*i - 4*a^6*b*c*d^3*g^4*i + a^7*d^4*g^4*i + (b^7*c^4*g^4*i - 4*a*b^6*c^3*d*g^4*i + 6*a^2*b^5*c^2*d^2*g^4*i - 4*a^3*b^4*c*d^3*g^4*i + a^4*b^3*d^4*g^4*i)*x^3 + 3*(a*b^6*c^4*g^4*i - 4*a^2*b^5*c^3*d*g^4*i + 6*a^3*b^4*c^2*d^2*g^4*i - 4*a^4*b^3*c*d^3*g^4*i + a^5*b^2*d^4*g^4*i)*x^2 + 3*(a^2*b^5*c^4*g^4*i - 4*a^3*b^4*c^3*d*g^4*i + 6*a^4*b^3*c^2*d^2*g^4*i - 4*a^5*b^2*c*d^3*g^4*i + a^6*b*d^4*g^4*i)*x) + (8*b^3*c^3 - 81*a*b^2*c^2*d + 648*a^2*b*c*d^2 - 575*a^3*d^3 + 36*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a)^3 - 36*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(d*x + c)^3 + 510*(b^3*c*d^2 - a*b^2*d^3)*x^2 - 198*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a)^2 - 18*(11*b^3*d^3*x^3 + 33*a*b^2*d^3*x^2 + 33*a^2*b*d^3*x + 11*a^3*d^3 - 6*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a))*log(d*x + c)^2 - 3*(19*b^3*c^2*d - 378*a*b^2*c*d^2 + 359*a^2*b*d^3)*x + 510*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a) - 6*(85*b^3*d^3*x^3 + 255*a*b^2*d^3*x^2 + 255*a^2*b*d^3*x + 85*a^3*d^3 + 18*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a)^2 - 66*(b^3*d^3*x^3$$

$$\begin{aligned}
& + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*\log(b*x + a))*\log(d*x + c))/(a \\
& ^3*b^4*c^4*g^4*i - 4*a^4*b^3*c^3*d*g^4*i + 6*a^5*b^2*c^2*d^2*g^4*i - 4*a^6* \\
& b*c*d^3*g^4*i + a^7*d^4*g^4*i + (b^7*c^4*g^4*i - 4*a*b^6*c^3*d*g^4*i + 6*a^ \\
& 2*b^5*c^2*d^2*g^4*i - 4*a^3*b^4*c*d^3*g^4*i + a^4*b^3*d^4*g^4*i)*x^3 + 3*(a \\
& *b^6*c^4*g^4*i - 4*a^2*b^5*c^3*d*g^4*i + 6*a^3*b^4*c^2*d^2*g^4*i - 4*a^4*b^ \\
& 3*c*d^3*g^4*i + a^5*b^2*d^4*g^4*i)*x^2 + 3*(a^2*b^5*c^4*g^4*i - 4*a^3*b^4*c \\
& ^3*d*g^4*i + 6*a^4*b^3*c^2*d^2*g^4*i - 4*a^5*b^2*c*d^3*g^4*i + a^6*b*d^4*g^ \\
& 4*i)*x) - 1/6*A^2*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3 \\
& *(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3 \\
& *b^3*d^3)*g^4*i*x^3 + 3*(a*b^5*c^3 - 3*a^2*b^4*c^2*d + 3*a^3*b^3*c*d^2 - a^ \\
& 4*b^2*d^3)*g^4*i*x^2 + 3*(a^2*b^4*c^3 - 3*a^3*b^3*c^2*d + 3*a^4*b^2*c*d^2 - \\
& a^5*b*d^3)*g^4*i*x + (a^3*b^3*c^3 - 3*a^4*b^2*c^2*d + 3*a^5*b*c*d^2 - a^6* \\
& d^3)*g^4*i) + 6*d^3*\log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2* \\
& d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^4*i) - 6*d^3*\log(d*x + c)/((b^4*c^4 - 4*a* \\
& b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^4*i)) - 1/18*(4* \\
& b^3*c^3 - 27*a*b^2*c^2*d + 108*a^2*b*c*d^2 - 85*a^3*d^3 + 66*(b^3*c*d^2 - a \\
& *b^2*d^3)*x^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3 \\
& )*\log(b*x + a)^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3* \\
& d^3)*\log(d*x + c)^2 - 3*(5*b^3*c^2*d - 54*a*b^2*c*d^2 + 49*a^2*b*d^3)*x + 6 \\
& 6*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*\log(b*x + a) - \\
& 6*(11*b^3*d^3*x^3 + 33*a*b^2*d^3*x^2 + 33*a^2*b*d^3*x + 11*a^3*d^3 - 6*(b^3 \\
& *d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*\log(b*x + a))*\log(d*x \\
& + c))*A*B/(a^3*b^4*c^4*g^4*i - 4*a^4*b^3*c^3*d*g^4*i + 6*a^5*b^2*c^2*d^2*g \\
& ^4*i - 4*a^6*b*c*d^3*g^4*i + a^7*d^4*g^4*i + (b^7*c^4*g^4*i - 4*a*b^6*c^3*d \\
& *g^4*i + 6*a^2*b^5*c^2*d^2*g^4*i - 4*a^3*b^4*c*d^3*g^4*i + a^4*b^3*d^4*g^4* \\
& i)*x^3 + 3*(a*b^6*c^4*g^4*i - 4*a^2*b^5*c^3*d*g^4*i + 6*a^3*b^4*c^2*d^2*g^4 \\
& *i - 4*a^4*b^3*c*d^3*g^4*i + a^5*b^2*d^4*g^4*i)*x^2 + 3*(a^2*b^5*c^4*g^4*i \\
& - 4*a^3*b^4*c^3*d*g^4*i + 6*a^4*b^3*c^2*d^2*g^4*i - 4*a^5*b^2*c*d^3*g^4*i + \\
& a^6*b*d^4*g^4*i)*x)
\end{aligned}$$


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**Fricas [A]** time = 0.602219, size = 1991, normalized size = 3.93

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^4/(d\*i\*x+c\*i),x, algor  
ithm="fricas")

[Out]  $-1/108*(4*(9*A^2 + 6*A*B + 2*B^2)*b^3*c^3 - 81*(2*A^2 + 2*A*B + B^2)*a*b^2* \\ c^2*d + 324*(A^2 + 2*A*B + 2*B^2)*a^2*b*c*d^2 - (198*A^2 + 510*A*B + 575*B^ \\ 2)*a^3*d^3 + 36*(B^2*b^3*d^3*x^3 + 3*B^2*a*b^2*d^3*x^2 + 3*B^2*a^2*b*d^3*x$



$$\begin{aligned}
& + B^2 a^3 d^3 \log((b e x + a e) / (d x + c))^3 + 6 * ((18 A^2 + 66 A B + 85 B^2) * b^3 c d^2 - (18 A^2 + 66 A B + 85 B^2) * a b^2 d^3) * x^2 + 18 * ((6 A B + 11 B^2) * b^3 d^3 * x^3 + 2 B^2 b^3 c^3 - 9 B^2 a b^2 c^2 d + 18 B^2 a^2 b c d^2 + 6 A B a^3 d^3 + 3 * (2 B^2 b^3 c d^2 + 3 * (2 A B + 3 B^2) * a b^2 d^3) * x^2 - 3 * (B^2 b^3 c^2 d - 6 B^2 a b^2 c d^2 - 6 * (A B + B^2) * a^2 b d^3) * x) * \log((b e x + a e) / (d x + c))^2 - 3 * ((18 A^2 + 30 A B + 19 B^2) * b^3 c^2 d - 54 * (2 A^2 + 6 A B + 7 B^2) * a b^2 c d^2 + (90 A^2 + 294 A B + 359 B^2) * a^2 b d^3) * x + 6 * ((18 A^2 + 66 A B + 85 B^2) * b^3 d^3 * x^3 + 18 A^2 a^3 d^3 + 4 * (3 A B + B^2) * b^3 c^3 - 27 * (2 A B + B^2) * a b^2 c^2 d + 108 * (A B + B^2) * a^2 b c d^2 + 3 * (2 * (6 A B + 11 B^2) * b^3 c d^2 + 9 * (2 A^2 + 6 A B + 7 B^2) * a b^2 d^3) * x^2 - 3 * ((6 A B + 5 B^2) * b^3 c^2 d - 18 * (2 A B + 3 B^2) * a b^2 c d^2 - 18 * (A^2 + 2 A B + 2 B^2) * a^2 b d^3) * x) * \log((b e x + a e) / (d x + c)) / ((b^7 c^4 - 4 a b^6 c^3 d + 6 a^2 b^5 c^2 d^2 - 4 a^3 b^4 c d^3 + a^4 b^3 d^4) * g^4 i x^3 + 3 * (a b^6 c^4 - 4 a^2 b^5 c^3 d + 6 a^3 b^4 c^2 d^2 - 4 a^4 b^3 c d^3 + a^5 b^2 d^4) * g^4 i x^2 + 3 * (a^2 b^5 c^4 - 4 a^3 b^4 c^3 d + 6 a^4 b^3 c^2 d^2 - 4 a^5 b^2 c d^3 + a^6 b d^4) * g^4 i x + (a^3 b^4 c^4 - 4 a^4 b^3 c^3 d + 6 a^5 b^2 c^2 d^2 - 4 a^6 b c d^3 + a^7 d^4) * g^4 i)
\end{aligned}$$

**Sympy [B]** time = 50.194, size = 2388, normalized size = 4.71

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A\*B\*ln(e\*(b\*x+a)/(d\*x+c)))\*\*2/(b\*g\*x+a\*g)\*\*4/(d\*i\*x+c\*i),x)

[Out] 
$$\begin{aligned}
& -B**2*d**3*\log(e*(a + b*x)/(c + d*x))**3/(3*a**4*d**4*g**4*i - 12*a**3*b*c*d**3*g**4*i + 18*a**2*b**2*c**2*d**2*g**4*i - 12*a*b**3*c**3*d*g**4*i + 3*b**4*c**4*g**4*i) + d**3*(18*A**2 + 66*A*B + 85*B**2)*\log(x + (18*A**2*a*d**4 + 18*A**2*b*c*d**3 + 66*A*B*a*d**4 + 66*A*B*b*c*d**3 + 85*B**2*a*d**4 + 85*B**2*b*c*d**3 - a**5*d**8*(18*A**2 + 66*A*B + 85*B**2)/(a*d - b*c)**4 + 5*a**4*b*c*d**7*(18*A**2 + 66*A*B + 85*B**2)/(a*d - b*c)**4 - 10*a**3*b**2*c**2*d**6*(18*A**2 + 66*A*B + 85*B**2)/(a*d - b*c)**4 + 10*a**2*b**3*c**3*d**5*(18*A**2 + 66*A*B + 85*B**2)/(a*d - b*c)**4 - 5*a*b**4*c**4*d**4*(18*A**2 + 66*A*B + 85*B**2)/(a*d - b*c)**4 + b**5*c**5*d**3*(18*A**2 + 66*A*B + 85*B**2)/(a*d - b*c)**4)/(36*A**2*b*d**4 + 132*A*B*b*d**4 + 170*B**2*b*d**4) / (18*g**4*i*(a*d - b*c)**4 - d**3*(18*A**2 + 66*A*B + 85*B**2)*\log(x + (18*A**2*a*d**4 + 18*A**2*b*c*d**3 + 66*A*B*a*d**4 + 66*A*B*b*c*d**3 + 85*B**2*a*d**4 + 85*B**2*b*c*d**3 + a**5*d**8*(18*A**2 + 66*A*B + 85*B**2)/(a*d - b*c)**4 - 5*a**4*b*c*d**7*(18*A**2 + 66*A*B + 85*B**2)/(a*d - b*c)**4 + 10*a**3*b**2*c**2*d**6*(18*A**2 + 66*A*B + 85*B**2)/(a*d - b*c)**4 - 10*a**2*b**3*c**3*d**5*(18*A**2 + 66*A*B + 85*B**2)/(a*d - b*c)**4 + 5*a*b**4*c**4*d**4
\end{aligned}$$

$$\begin{aligned}
& d^{**4}*(18*A^{**2} + 66*A*B + 85*B^{**2})/(a*d - b*c)^{**4} - b^{**5}*c^{**5}*d^{**3}*(18*A^{**2} \\
& + 66*A*B + 85*B^{**2})/(a*d - b*c)^{**4})/(36*A^{**2}*b*d^{**4} + 132*A*B*b*d^{**4} + 170* \\
& B^{**2}*b*d^{**4}))/((18*g^{**4}*i*(a*d - b*c)^{**4}) + (66*A*B*a^{**2}*d^{**2} - 42*A*B*a*b*c \\
& *d + 90*A*B*a*b*d^{**2}*x + 12*A*B*b^{**2}*c^{**2} - 18*A*B*b^{**2}*c*d*x + 36*A*B*b^{**2} \\
& *d^{**2}*x^{**2} + 85*B^{**2}*a^{**2}*d^{**2} - 23*B^{**2}*a*b*c*d + 147*B^{**2}*a*b*d^{**2}*x + 4* \\
& B^{**2}*b^{**2}*c^{**2} - 15*B^{**2}*b^{**2}*c*d*x + 66*B^{**2}*b^{**2}*d^{**2}*x^{**2})*\log(e*(a + b* \\
& x)/(c + d*x))/((18*a^{**6}*d^{**3}*g^{**4}*i - 54*a^{**5}*b*c*d^{**2}*g^{**4}*i + 54*a^{**5}*b*d \\
& *3*g^{**4}*i*x + 54*a^{**4}*b^{**2}*c^{**2}*d*g^{**4}*i - 162*a^{**4}*b^{**2}*c*d^{**2}*g^{**4}*i*x + \\
& 54*a^{**4}*b^{**2}*d^{**3}*g^{**4}*i*x^{**2} - 18*a^{**3}*b^{**3}*c^{**3}*g^{**4}*i + 162*a^{**3}*b^{**3}*c* \\
& *2*d*g^{**4}*i*x - 162*a^{**3}*b^{**3}*c*d^{**2}*g^{**4}*i*x^{**2} + 18*a^{**3}*b^{**3}*d^{**3}*g^{**4}*i \\
& *x^{**3} - 54*a^{**2}*b^{**4}*c^{**3}*g^{**4}*i*x + 162*a^{**2}*b^{**4}*c^{**2}*d*g^{**4}*i*x^{**2} - 54* \\
& a^{**2}*b^{**4}*c*d^{**2}*g^{**4}*i*x^{**3} - 54*a*b^{**5}*c^{**3}*g^{**4}*i*x^{**2} + 54*a*b^{**5}*c^{**2}* \\
& d*g^{**4}*i*x^{**3} - 18*b^{**6}*c^{**3}*g^{**4}*i*x^{**3}) + (-6*A*B*a^{**3}*d^{**3} - 18*A*B*a^{**2} \\
& *b*d^{**3}*x - 18*A*B*a*b^{**2}*d^{**3}*x^{**2} - 6*A*B*b^{**3}*d^{**3}*x^{**3} - 18*B^{**2}*a^{**2}*b \\
& *c*d^{**2} - 18*B^{**2}*a^{**2}*b*d^{**3}*x + 9*B^{**2}*a*b^{**2}*c^{**2}*d - 18*B^{**2}*a*b^{**2}*c*d \\
& **2*x - 27*B^{**2}*a*b^{**2}*d^{**3}*x^{**2} - 2*B^{**2}*b^{**3}*c^{**3} + 3*B^{**2}*b^{**3}*c^{**2}*d*x \\
& - 6*B^{**2}*b^{**3}*c*d^{**2}*x^{**2} - 11*B^{**2}*b^{**3}*d^{**3}*x^{**3})*\log(e*(a + b*x)/(c + d* \\
& x))^{**2}/(6*a^{**7}*d^{**4}*g^{**4}*i - 24*a^{**6}*b*c*d^{**3}*g^{**4}*i + 18*a^{**6}*b*d^{**4}*g^{**4}* \\
& i*x + 36*a^{**5}*b^{**2}*c^{**2}*d^{**2}*g^{**4}*i - 72*a^{**5}*b^{**2}*c*d^{**3}*g^{**4}*i*x + 18*a^{** \\
& 5}*b^{**2}*d^{**4}*g^{**4}*i*x^{**2} - 24*a^{**4}*b^{**3}*c^{**3}*d*g^{**4}*i + 108*a^{**4}*b^{**3}*c^{**2}*d \\
& **2*g^{**4}*i*x - 72*a^{**4}*b^{**3}*c*d^{**3}*g^{**4}*i*x^{**2} + 6*a^{**4}*b^{**3}*d^{**4}*g^{**4}*i*x* \\
& **3 + 6*a^{**3}*b^{**4}*c^{**4}*g^{**4}*i - 72*a^{**3}*b^{**4}*c^{**3}*d*g^{**4}*i*x + 108*a^{**3}*b^{**4} \\
& *c^{**2}*d^{**2}*g^{**4}*i*x^{**2} - 24*a^{**3}*b^{**4}*c*d^{**3}*g^{**4}*i*x^{**3} + 18*a^{**2}*b^{**5}*c^{** \\
& 4*g^{**4}*i*x - 72*a^{**2}*b^{**5}*c^{**3}*d*g^{**4}*i*x^{**2} + 36*a^{**2}*b^{**5}*c^{**2}*d^{**2}*g^{**4}* \\
& i*x^{**3} + 18*a*b^{**6}*c^{**4}*g^{**4}*i*x^{**2} - 24*a*b^{**6}*c^{**3}*d*g^{**4}*i*x^{**3} + 6*b^{**7} \\
& *c^{**4}*g^{**4}*i*x^{**3}) + (198*A^{**2}*a^{**2}*d^{**2} - 126*A^{**2}*a*b*c*d + 36*A^{**2}*b^{**2}* \\
& c^{**2} + 510*A*B*a^{**2}*d^{**2} - 138*A*B*a*b*c*d + 24*A*B*b^{**2}*c^{**2} + 575*B^{**2}*a* \\
& *2*d^{**2} - 73*B^{**2}*a*b*c*d + 8*B^{**2}*b^{**2}*c^{**2} + x^{**2}*(108*A^{**2}*b^{**2}*d^{**2} + 3 \\
& 96*A*B*b^{**2}*d^{**2} + 510*B^{**2}*b^{**2}*d^{**2}) + x*(270*A^{**2}*a*b*d^{**2} - 54*A^{**2}*b^{** \\
& 2}*c*d + 882*A*B*a*b*d^{**2} - 90*A*B*b^{**2}*c*d + 1077*B^{**2}*a*b*d^{**2} - 57*B^{**2}*b \\
& **2*c*d))/((108*a^{**6}*d^{**3}*g^{**4}*i - 324*a^{**5}*b*c*d^{**2}*g^{**4}*i + 324*a^{**4}*b^{**2}* \\
& c^{**2}*d*g^{**4}*i - 108*a^{**3}*b^{**3}*c^{**3}*g^{**4}*i + x^{**3}*(108*a^{**3}*b^{**3}*d^{**3}*g^{**4}*i \\
& - 324*a^{**2}*b^{**4}*c*d^{**2}*g^{**4}*i + 324*a*b^{**5}*c^{**2}*d*g^{**4}*i - 108*b^{**6}*c^{**3}*g \\
& **4*i) + x^{**2}*(324*a^{**4}*b^{**2}*d^{**3}*g^{**4}*i - 972*a^{**3}*b^{**3}*c*d^{**2}*g^{**4}*i + 97 \\
& 2*a^{**2}*b^{**4}*c^{**2}*d*g^{**4}*i - 324*a*b^{**5}*c^{**3}*g^{**4}*i) + x*(324*a^{**5}*b*d^{**3}*g* \\
& **4*i - 972*a^{**4}*b^{**2}*c*d^{**2}*g^{**4}*i + 972*a^{**3}*b^{**3}*c^{**2}*d*g^{**4}*i - 324*a^{**2} \\
& *b^{**4}*c^{**3}*g^{**4}*i))
\end{aligned}$$

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B \log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)^2}{(bgx+ag)^4(dx+ci)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4/(d*i*x+c*i),x, algo
ithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/((b*g*x + a*g)^4*(d*i*x + c*
i)), x)
```

$$3.92 \quad \int \frac{(ag+bgx)^3 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)^2}{(ci+dix)^2} dx$$

**Optimal.** Leaf size=722

$$\frac{6bBg^3(bc-ad)^2 \text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right) \left( B \log\left(\frac{e(a+bx)}{c+dx}\right) + A \right)}{d^4 i^2} - \frac{6bB^2g^3(bc-ad)^2 \text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)}{d^4 i^2} - \frac{bB^2g^3(bc-ad)^2 \text{PolyLog}\left(3, \frac{d(a+bx)}{b(c+dx)}\right)}{d^4 i^2}$$

```
[Out] (2*A*B*(b*c - a*d)^2*g^3*(a + b*x))/(d^3*i^2*(c + d*x)) - (2*B^2*(b*c - a*d)^2*g^3*(a + b*x))/(d^3*i^2*(c + d*x)) + (2*B^2*(b*c - a*d)^2*g^3*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)]/(d^3*i^2*(c + d*x)) - (b*B*(b*c - a*d)*g^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^3*i^2) - (6*b*B*(b*c - a*d)^2*g^3*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^4*i^2) - (3*b*(b*c - a*d)*g^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2)/(d^3*i^2) - ((b*c - a*d)^2*g^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2)/(d^3*i^2*(c + d*x)) + (b^3*g^3*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2)/(2*d^4*i^2) - (3*b*(b*c - a*d)^2*g^3*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2)/(d^4*i^2) + (b*B^2*(b*c - a*d)^2*g^3*Log[c + d*x))/(d^4*i^2) + (b*B*(b*c - a*d)^2*g^3*(A + B*Log[(e*(a + b*x))/(c + d*x]])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(d^4*i^2) - (6*b*B^2*(b*c - a*d)^2*g^3*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i^2) - (6*b*B*(b*c - a*d)^2*g^3*(A + B*Log[(e*(a + b*x))/(c + d*x]])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i^2) - (b*B^2*(b*c - a*d)^2*g^3*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(d^4*i^2) + (6*b*B^2*(b*c - a*d)^2*g^3*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i^2)
```

**Rubi [B]** time = 6.14966, antiderivative size = 2224, normalized size of antiderivative = 3.08, number of steps used = 119, number of rules used = 28, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.667$ , Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 2486, 31, 44, 6688, 6742, 2500, 2433, 2375, 2317, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2)/(c*i + d*i*x)^2,x]
```

```
[Out] -((A*b^2*B*(b*c - a*d)*g^3*x)/(d^3*i^2)) + (2*B^2*(b*c - a*d)^3*g^3)/(d^4*i^2*(c + d*x)) + (2*b*B^2*(b*c - a*d)^2*g^3*Log[a + b*x))/(d^4*i^2) + (a^2*b
```

$$\begin{aligned}
& *B^2g^3\text{Log}[a + b*x]^2)/(2*d^2i^2) + (a*b*B^2(2*b*c - 3*a*d)*g^3\text{Log}[a + \\
& b*x]^2)/(d^3i^2) + (b*B^2(b*c - a*d)^2g^3\text{Log}[a + b*x]^2)/(d^4i^2) - ( \\
& 3*b*B^2(b*c - a*d)^2g^3\text{Log}[a + b*x]*\text{Log}[(c + d*x)^{-1}]^2)/(d^4i^2) + ( \\
& 3*b*B^2(b*c - a*d)^2g^3\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[(c + d*x)^{-1}]^2)/(d^4i^2) - (b*B^2(b*c - a*d)*g^3*(a + b*x)*\text{Log}[(e*(a + b*x))/(c + \\
& d*x)])/(d^3i^2) - (2*B*(b*c - a*d)^3g^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d* \\
& x)]))/(d^4i^2*(c + d*x)) - (a^2*b*B*g^3\text{Log}[a + b*x]*(A + B*\text{Log}[(e*(a + b* \\
& x))/(c + d*x)]))/(d^2i^2) - (2*a*b*B*(2*b*c - 3*a*d)*g^3\text{Log}[a + b*x]*(A + \\
& B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(d^3i^2) - (2*b*B*(b*c - a*d)^2g^3\text{Log}[ \\
& a + b*x]*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(d^4i^2) - (b^2*(2*b*c - 3* \\
& a*d)*g^3*x*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]^2)/(d^3i^2) + (b^3g^3*x^2 \\
& *(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]^2)/(2*d^2i^2) + ((b*c - a*d)^3g^3*( \\
& A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]^2)/(d^4i^2*(c + d*x)) - (b*B^2(b*c - \\
& a*d)^2g^3\text{Log}[c + d*x])/(d^4i^2) - (3*b*B^2(b*c - a*d)^2g^3\text{Log}[a + b*x \\
& ]^2*\text{Log}[c + d*x])/(d^4i^2) - (b^3*B^2*c^2g^3\text{Log}[-((d*(a + b*x))/(b*c - a \\
& *d))]*\text{Log}[c + d*x])/(d^4i^2) - (2*b^2*B^2*c*(2*b*c - 3*a*d)*g^3\text{Log}[-((d*( \\
& a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/(d^4i^2) - (6*A*b*B*(b*c - a*d)^2g^ \\
& 3\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/(d^4i^2) - (2*b*B^2(b*c \\
& - a*d)^2g^3\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/(d^4i^2) - ( \\
& 6*b*B^2(b*c - a*d)^2g^3\text{Log}[a + b*x]*\text{Log}[(c + d*x)^{-1}]*\text{Log}[c + d*x])/(d \\
& ^4i^2) + (6*b*B^2(b*c - a*d)^2g^3\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*(\text{Log} \\
& [a + b*x] + \text{Log}[(c + d*x)^{-1}] - \text{Log}[(e*(a + b*x))/(c + d*x)])*\text{Log}[c + d*x \\
& ])/(d^4i^2) + (b^3*B*c^2g^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])*\text{Log}[c + \\
& d*x])/(d^4i^2) + (2*b^2*B*c*(2*b*c - 3*a*d)*g^3*(A + B*\text{Log}[(e*(a + b*x))/( \\
& c + d*x)])*\text{Log}[c + d*x])/(d^4i^2) + (2*b*B*(b*c - a*d)^2g^3*(A + B*\text{Log}[(e \\
& *(a + b*x))/(c + d*x)])*\text{Log}[c + d*x])/(d^4i^2) + (3*b*(b*c - a*d)^2g^3*(A \\
& + B*\text{Log}[(e*(a + b*x))/(c + d*x)]^2*\text{Log}[c + d*x])/(d^4i^2) + (b^3*B^2*c^2 \\
& *g^3\text{Log}[c + d*x]^2)/(2*d^4i^2) + (b^2*B^2*c*(2*b*c - 3*a*d)*g^3\text{Log}[c + d \\
& *x]^2)/(d^4i^2) + (3*A*b*B*(b*c - a*d)^2g^3\text{Log}[c + d*x]^2)/(d^4i^2) + ( \\
& b*B^2(b*c - a*d)^2g^3\text{Log}[c + d*x]^2)/(d^4i^2) - (3*b*B^2(b*c - a*d)^2* \\
& g^3\text{Log}[a + b*x]*\text{Log}[c + d*x]^2)/(d^4i^2) + (3*b*B^2(b*c - a*d)^2g^3\text{Log} \\
& [(e*(a + b*x))/(c + d*x)]*\text{Log}[c + d*x]^2)/(d^4i^2) + (b*B^2(b*c - a*d)^2* \\
& g^3\text{Log}[c + d*x]^3)/(d^4i^2) - (a^2*b*B^2g^3\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x) \\
& )/(b*c - a*d)]/(d^2i^2) - (2*a*b*B^2(2*b*c - 3*a*d)*g^3\text{Log}[a + b*x]*\text{Lo \\
& g}[(b*(c + d*x))/(b*c - a*d)]/(d^3i^2) - (2*b*B^2(b*c - a*d)^2g^3\text{Log}[a \\
& + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)]/(d^4i^2) + (3*b*B^2(b*c - a*d)^2g \\
& ^3\text{Log}[a + b*x]^2*\text{Log}[(b*(c + d*x))/(b*c - a*d)]/(d^4i^2) - (a^2*b*B^2g^ \\
& 3\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]/(d^2i^2) - (2*a*b*B^2(2*b*c - \\
& 3*a*d)*g^3\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]/(d^3i^2) - (2*b*B^2* \\
& (b*c - a*d)^2g^3\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]/(d^4i^2) + (6* \\
& b*B^2(b*c - a*d)^2g^3\text{Log}[a + b*x]*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d) \\
& )]/(d^4i^2) - (b^3*B^2*c^2g^3\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]/(d^ \\
& 4i^2) - (2*b^2*B^2*c*(2*b*c - 3*a*d)*g^3\text{PolyLog}[2, (b*(c + d*x))/(b*c - a \\
& *d)]/(d^4i^2) - (6*A*b*B*(b*c - a*d)^2g^3\text{PolyLog}[2, (b*(c + d*x))/(b*c \\
& - a*d)]/(d^4i^2) - (2*b*B^2(b*c - a*d)^2g^3\text{PolyLog}[2, (b*(c + d*x))/(b
\end{aligned}$$

```
*c - a*d)]/(d^4*i^2) - (6*b*B^2*(b*c - a*d)^2*g^3*Log[(c + d*x)^(-1)]*Poly
Log[2, (b*(c + d*x))/(b*c - a*d)]/(d^4*i^2) + (6*b*B^2*(b*c - a*d)^2*g^3*(
Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*PolyLog[
2, (b*(c + d*x))/(b*c - a*d)]/(d^4*i^2) - (6*b*B^2*(b*c - a*d)^2*g^3*PolyL
og[3, -((d*(a + b*x))/(b*c - a*d))]/(d^4*i^2) - (6*b*B^2*(b*c - a*d)^2*g^3
*PolyLog[3, (b*(c + d*x))/(b*c - a*d)]/(d^4*i^2)
```

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] := Simp[x*(a +
b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
```

qQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] := Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n]))/g, x] - Dist[(b\*e^n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] := -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rule 2525

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*((d\_.) + (e\_.)\*(x\_))^(m\_.), x\_Symbol] := Simp[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^n)/(e\*(m + 1)), x] - Dist[(b\*n\*p)/(e\*(m + 1)), Int[SimplifyIntegrand[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

### Rule 2486

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.), x\_Symbol] := Simp[((a + b\*x)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/b, x] + Dist[(q\*r\*s\*(b\*c - a\*d))/b, Int[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1)/(c + d\*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]

### Rule 31

```
Int[((a_) + (b_)*(x_))^-1), x_Symbol] := Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

#### Rule 44

```
Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

#### Rule 6688

```
Int[u_, x_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

#### Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

#### Rule 2500

```
Int[(Log[(e_)*((f_)*((a_) + (b_)*(x_))^(p_)*((c_) + (d_)*(x_))^(q_))
)^(r_)]*((s_) + Log[(i_)*((g_) + (h_)*(x_))^(n_)]*(t_)))/((j_) + (k
_)*(x_)), x_Symbol] := Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

#### Rule 2433

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_))^(n_)]*(b_))^(p_)*((f_) + Log
[(h_)*((i_) + (j_)*(x_))^(m_)]*(g_))*((k_) + (l_)*(x_))^(r_), x_Sym
bol] := Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
e*i - d*j)/e + (j*x)/e]^m), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*1, 0]
```

#### Rule 2375

```
Int[(Log[(d_)*((e_) + (f_)*(x_))^(m_))^(r_)]*((a_) + Log[(c_)*(x_))^(n_
)]*(b_))^(p_))/(x_), x_Symbol] := Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
```



e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d\*e, 1]

### Rule 2317

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/((d\_) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^p)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

### Rule 2374

Int[(Log[(d\_.)\*((e\_) + (f\_.)\*(x\_)^(m\_.))]\*((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.))/(x\_), x\_Symbol] := -Simp[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^p)/m, x] + Dist[(b\*n\*p)/m, Int[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0] && EqQ[d\*e, 1]

### Rule 6589

Int[PolyLog[n\_, (c\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)]/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] := Simp[PolyLog[n + 1, c\*(a + b\*x)^p]/(e\*p), x] /; FreeQ[{a, b, c, d, e, n, p}, x] && EqQ[b\*d, a\*e]

### Rule 2440

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))\*((f\_.) + Log[(h\_.)\*((i\_.) + (j\_.)\*(x\_))^(m\_.)]\*(g\_.))\*((k\_) + (l\_.)\*(x\_))^(r\_.), x\_Symbol] := Dist[1/l, Subst[Int[x^r\*(a + b\*Log[c\*(-((e\*k - d\*1)/1) + (e\*x)/1)^n]\*(f + g\*Log[h\*(i + j\*x)^m]), x], x, k + l\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]

### Rule 2434

Int[(((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))\*((f\_.) + Log[(h\_.)\*((i\_.) + (j\_.)\*(x\_))^(m\_.)]\*(g\_.)))/(x\_), x\_Symbol] := Simp[Log[x]\*(a + b\*Log[c\*(d + e\*x)^n]\*(f + g\*Log[h\*(i + j\*x)^m]), x] + (-Dist[e\*g\*m, Int[(Log[x]\*(a + b\*Log[c\*(d + e\*x)^n])]/(d + e\*x), x], x] - Dist[b\*j\*n, Int[(Log[x]\*(f + g\*Log[h\*(i + j\*x)^m])]/(i + j\*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, m, n}, x] && EqQ[e\*i - d\*j, 0]

### Rule 2499

Int[(Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]\*((s\_.) + Log[(i\_.)\*((g\_.) + (h\_.)\*(x\_))^(n\_.)]\*(t\_.))^(m\_.))/(j\_.) + (k\_.)\*(x\_)), x\_Symbol] := Simp[((s + t\*Log[i\*(g + h\*x)^n])^(m + 1)\*Log[

```
e*(f*(a + b*x)^p*(c + d*x)^q)^r)/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

### Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

### Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)/(x_), x_Symbol] := Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
x]
```

### Rule 30

```
Int[(x_)^(m_.), x_Symbol] := Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

### Rubi steps

$$\begin{aligned}
\int \frac{(ag + bgx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(92c + 92dx)^2} dx &= \int \left( -\frac{b^2(2bc - 3ad)g^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{8464d^3} + \frac{b^3g^3x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{8464d^2} \right) dx \\
&= \frac{(b^3g^3) \int x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{8464d^2} - \frac{(b^2(2bc - 3ad)g^3) \int \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{8464d^3} \\
&= -\frac{b^2(2bc - 3ad)g^3x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{8464d^3} + \frac{b^3g^3x^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{16928d^2} + \dots \\
&= -\frac{b^2(2bc - 3ad)g^3x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{8464d^3} + \frac{b^3g^3x^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{16928d^2} + \dots \\
&= -\frac{b^2(2bc - 3ad)g^3x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{8464d^3} + \frac{b^3g^3x^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{16928d^2} + \dots \\
&= -\frac{b^2(2bc - 3ad)g^3x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{8464d^3} + \frac{b^3g^3x^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{16928d^2} + \dots \\
&= -\frac{Ab^2B(bc - ad)g^3x}{8464d^3} - \frac{B(bc - ad)^3g^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{4232d^4(c + dx)} - \frac{a^2bBg^3 \log(a + bx)}{4232d^4} \\
&= -\frac{Ab^2B(bc - ad)g^3x}{8464d^3} - \frac{bB^2(bc - ad)g^3(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{8464d^3} - \frac{B(bc - ad)^3g^3}{4232d^4} \\
&= -\frac{Ab^2B(bc - ad)g^3x}{8464d^3} - \frac{bB^2(bc - ad)g^3(a + bx) \log \left( \frac{e(a+bx)}{c+dx} \right)}{8464d^3} - \frac{B(bc - ad)^3g^3}{4232d^4} \\
&= -\frac{Ab^2B(bc - ad)g^3x}{8464d^3} + \frac{B^2(bc - ad)^3g^3}{4232d^4(c + dx)} + \frac{bB^2(bc - ad)^2g^3 \log(a + bx)}{4232d^4} - \frac{bB^2}{4232d^4} \\
&= -\frac{Ab^2B(bc - ad)g^3x}{8464d^3} + \frac{B^2(bc - ad)^3g^3}{4232d^4(c + dx)} + \frac{bB^2(bc - ad)^2g^3 \log(a + bx)}{4232d^4} - \frac{bB^2}{4232d^4} \\
&= -\frac{Ab^2B(bc - ad)g^3x}{8464d^3} + \frac{B^2(bc - ad)^3g^3}{4232d^4(c + dx)} + \frac{bB^2(bc - ad)^2g^3 \log(a + bx)}{4232d^4} + \frac{a^2b}{4232d^4} \\
&= -\frac{Ab^2B(bc - ad)g^3x}{8464d^3} + \frac{B^2(bc - ad)^3g^3}{4232d^4(c + dx)} + \frac{bB^2(bc - ad)^2g^3 \log(a + bx)}{4232d^4} + \frac{a^2b}{4232d^4}
\end{aligned}$$

**Mathematica [B]** time = 7.4011, size = 5193, normalized size = 7.19

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d*i*x)^2,x]
```

[Out] Result too large to show

**Maple [F]** time = 2.414, size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^3}{(dix + ci)^2} \left( A + B \ln \left( \frac{e(bx + a)}{dx + c} \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x)
```

```
[Out] int((b*g*x+a*g)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x)
```

**Maxima [F]** time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x, algorithm="maxima")
```

```
[Out] 1/2*(2*c^3/(d^5*i^2*x + c*d^4*i^2) + 6*c^2*log(d*x + c)/(d^4*i^2) + (d*x^2 - 4*c*x)/(d^3*i^2))*A^2*b^3*g^3 - 3*A^2*a*b^2*(c^2/(d^4*i^2*x + c*d^3*i^2) - x/(d^2*i^2) + 2*c*log(d*x + c)/(d^3*i^2))*g^3 + 3*A^2*a^2*b*g^3*(c/(d^3*i^2*x + c*d^2*i^2) + log(d*x + c)/(d^2*i^2)) - 2*A*B*a^3*g^3*(log(b*e*x/(d*x + c) + a*e/(d*x + c))/(d^2*i^2*x + c*d*i^2) - 1/(d^2*i^2*x + c*d*i^2) - b*log(b*x + a)/((b*c*d - a*d^2)*i^2) + b*log(d*x + c)/((b*c*d - a*d^2)*i^2)) - A^2*a^3*g^3/(d^2*i^2*x + c*d*i^2) + 1/2*(2*((b^3*c^2*d*g^3 - 2*a*b^2*c*d^
```

$$2*g^3 + a^2*b*d^3*g^3)*B^2*x + (b^3*c^3*g^3 - 2*a*b^2*c^2*d*g^3 + a^2*b*c*d^2*g^3)*B^2)*\log(dx + c)^3 + (B^2*b^3*d^3*g^3*x^3 - 3*(b^3*c*d^2*g^3 - 2*a*b^2*d^3*g^3)*B^2*x^2 - 2*(2*b^3*c^2*d*g^3 - 3*a*b^2*c*d^2*g^3)*B^2*x + 2*(b^3*c^3*g^3 - 3*a*b^2*c^2*d*g^3 + 3*a^2*b*c*d^2*g^3 - a^3*d^3*g^3)*B^2)*\log(dx + c)^2)/(d^5*i^2*x + c*d^4*i^2) - \text{integrate}(- (B^2*a^3*d^3*g^3*\log(e))^2 + (B^2*b^3*d^3*g^3*\log(e))^2 + 2*A*B*b^3*d^3*g^3*\log(e))*x^3 + 3*(B^2*a*b^2*d^3*g^3*\log(e))^2 + 2*A*B*a*b^2*d^3*g^3*\log(e))*x^2 + (B^2*b^3*d^3*g^3*x^3 + 3*B^2*a*b^2*d^3*g^3*x^2 + 3*B^2*a^2*b*d^3*g^3*x + B^2*a^3*d^3*g^3)*\log(b*x + a)^2 + 3*(B^2*a^2*b*d^3*g^3*\log(e))^2 + 2*A*B*a^2*b*d^3*g^3*\log(e))*x + 2*(B^2*a^3*d^3*g^3*\log(e) + (B^2*b^3*d^3*g^3*\log(e) + A*B*b^3*d^3*g^3))*x^3 + 3*(B^2*a*b^2*d^3*g^3*\log(e) + A*B*a*b^2*d^3*g^3))*x^2 + 3*(B^2*a^2*b*d^3*g^3*\log(e) + A*B*a^2*b*d^3*g^3))*x*\log(b*x + a) - ((2*A*B*b^3*d^3*g^3 + (2*g^3*\log(e) + g^3)*B^2*b^3*d^3))*x^3 + 2*(b^3*c^3*g^3 - 3*a*b^2*c^2*d*g^3 + 3*a^2*b*c*d^2*g^3 + (g^3*\log(e) - g^3)*a^3*d^3)*B^2 + 3*(2*A*B*a*b^2*d^3*g^3 - (b^3*c*d^2*g^3 - 2*(g^3*\log(e) + g^3)*a*b^2*d^3)*B^2))*x^2 + 2*(3*A*B*a^2*b*d^3*g^3 + (3*a^2*b*d^3*g^3*\log(e) - 2*b^3*c^2*d*g^3 + 3*a*b^2*c*d^2*g^3)*B^2))*x + 2*(B^2*b^3*d^3*g^3*x^3 + 3*B^2*a*b^2*d^3*g^3*x^2 + 3*B^2*a^2*b*d^3*g^3*x + B^2*a^3*d^3*g^3)*\log(b*x + a))*\log(dx + c))/(d^5*i^2*x^2 + 2*c*d^4*i^2*x + c^2*d^3*i^2), x)$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{A^2 b^3 g^3 x^3 + 3 A^2 a b^2 g^3 x^2 + 3 A^2 a^2 b g^3 x + A^2 a^3 g^3 + (B^2 b^3 g^3 x^3 + 3 B^2 a b^2 g^3 x^2 + 3 B^2 a^2 b g^3 x + B^2 a^3 g^3) \log\left(\frac{b e x + a}{d x + c}\right)}{d^2 i^2 x^2 + 2 c d i^2 x + c^2 i^2} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i)^2,x, algorithm="fricas")

[Out] integral((A^2\*b^3\*g^3\*x^3 + 3\*A^2\*a\*b^2\*g^3\*x^2 + 3\*A^2\*a^2\*b\*g^3\*x + A^2\*a^3\*g^3 + (B^2\*b^3\*g^3\*x^3 + 3\*B^2\*a\*b^2\*g^3\*x^2 + 3\*B^2\*a^2\*b\*g^3\*x + B^2\*a^3\*g^3)\*log((b\*e\*x + a\*e)/(d\*x + c)))^2 + 2\*(A\*B\*b^3\*g^3\*x^3 + 3\*A\*B\*a\*b^2\*g^3\*x^2 + 3\*A\*B\*a^2\*b\*g^3\*x + A\*B\*a^3\*g^3)\*log((b\*e\*x + a\*e)/(d\*x + c)))/(d^2\*i^2\*x^2 + 2\*c\*d\*i^2\*x + c^2\*i^2), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*\*3\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))\*\*2/(d\*i\*x+c\*i)\*\*2,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^3 \left( B \log\left(\frac{bx+a}{dx+c}\right) + A \right)^2}{(dix + ci)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i)^2,x, algorithm="giac")

[Out] integrate((b\*g\*x + a\*g)^3\*(B\*log((b\*x + a)\*e/(d\*x + c)) + A)^2/(d\*i\*x + c\*i)^2, x)

$$3.93 \quad \int \frac{(ag+bgx)^2 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)^2}{(ci+dx)^2} dx$$

**Optimal.** Leaf size=469

$$\frac{4bBg^2(bc-ad)\text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{d^3i^2} + \frac{2bB^2g^2(bc-ad)\text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)}{d^3i^2} - \frac{4bB^2g^2(bc-ad)\text{PolyLog}\left(3, \frac{d(a+bx)}{b(c+dx)}\right)}{d^3i^2}$$

```
[Out] (-2*A*B*(b*c - a*d)*g^2*(a + b*x))/(d^2*i^2*(c + d*x)) + (2*B^2*(b*c - a*d)*g^2*(a + b*x))/(d^2*i^2*(c + d*x)) - (2*B^2*(b*c - a*d)*g^2*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)]/(d^2*i^2*(c + d*x)) + (2*b*B*(b*c - a*d)*g^2*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^3*i^2) + (b*g^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(d^2*i^2) + ((b*c - a*d)*g^2*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(d^2*i^2*(c + d*x)) + (2*b*(b*c - a*d)*g^2*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(d^3*i^2) + (2*b*B^2*(b*c - a*d)*g^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i^2) + (4*b*B*(b*c - a*d)*g^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i^2) - (4*b*B^2*(b*c - a*d)*g^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i^2)
```

**Rubi [B]** time = 5.09331, antiderivative size = 1681, normalized size of antiderivative = 3.58, number of steps used = 94, number of rules used = 26, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.619$ , Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 44, 6688, 6742, 2500, 2433, 2375, 2317, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d*i*x)^2, x]
```

```
[Out] (-2*B^2*(b*c - a*d)^2*g^2)/(d^3*i^2*(c + d*x)) - (2*b*B^2*(b*c - a*d)*g^2*Log[a + b*x]/(d^3*i^2) - (a*b*B^2*g^2*Log[a + b*x]^2)/(d^2*i^2) - (b*B^2*(b*c - a*d)*g^2*Log[a + b*x]^2)/(d^3*i^2) + (2*b*B^2*(b*c - a*d)*g^2*Log[a + b*x]*Log[(c + d*x)^(-1)]^2)/(d^3*i^2) - (2*b*B^2*(b*c - a*d)*g^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^(-1)]^2)/(d^3*i^2) + (2*B*(b*c - a*d)^2*g^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^3*i^2*(c + d*x)) + (2*a*b*B*g^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^2*i^2) + (2*b*B
```

$$\begin{aligned}
& (b*c - a*d)*g^2*\text{Log}[a + b*x]*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(d^3*i^2) \\
& + (b^2*g^2*x*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])^2)/(d^2*i^2) - ((b*c - a*d)^2*g^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])^2)/(d^3*i^2*(c + d*x)) + (2*b*B^2*(b*c - a*d)*g^2*\text{Log}[c + d*x])/(d^3*i^2) + (2*b*B^2*(b*c - a*d)*g^2*\text{Log}[a + b*x]^2*\text{Log}[c + d*x])/(d^3*i^2) + (2*b^2*B^2*c*g^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/(d^3*i^2) + (4*A*b*B*(b*c - a*d)*g^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/(d^3*i^2) + (2*b*B^2*(b*c - a*d)*g^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/(d^3*i^2) + (4*b*B^2*(b*c - a*d)*g^2*\text{Log}[a + b*x]*\text{Log}[(c + d*x)^{-1}]*\text{Log}[c + d*x])/(d^3*i^2) - (4*b*B^2*(b*c - a*d)*g^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*(\text{Log}[a + b*x] + \text{Log}[(c + d*x)^{-1}]) - \text{Log}[(e*(a + b*x))/(c + d*x)]*\text{Log}[c + d*x])/(d^3*i^2) - (2*b^2*B*c*g^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])*\text{Log}[c + d*x])/(d^3*i^2) - (2*b*B*(b*c - a*d)*g^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])*\text{Log}[c + d*x])/(d^3*i^2) - (2*b*(b*c - a*d)*g^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])^2*\text{Log}[c + d*x])/(d^3*i^2) - (b^2*B^2*c*g^2*\text{Log}[c + d*x]^2)/(d^3*i^2) - (2*A*b*B*(b*c - a*d)*g^2*\text{Log}[c + d*x]^2)/(d^3*i^2) - (b*B^2*(b*c - a*d)*g^2*\text{Log}[c + d*x]^2)/(d^3*i^2) + (2*b*B^2*(b*c - a*d)*g^2*\text{Log}[a + b*x]*\text{Log}[c + d*x]^2)/(d^3*i^2) - (2*b*B^2*(b*c - a*d)*g^2*\text{Log}[(e*(a + b*x))/(c + d*x)]*\text{Log}[c + d*x]^2)/(d^3*i^2) - (2*b*B^2*(b*c - a*d)*g^2*\text{Log}[c + d*x]^3)/(3*d^3*i^2) + (2*a*b*B^2*g^2*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)]/(d^2*i^2) + (2*b*B^2*(b*c - a*d)*g^2*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)]/(d^3*i^2) - (2*b*B^2*(b*c - a*d)*g^2*\text{Log}[a + b*x]^2*\text{Log}[(b*(c + d*x))/(b*c - a*d)]/(d^3*i^2) + (2*a*b*B^2*g^2*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))])/(d^2*i^2) + (2*b*B^2*(b*c - a*d)*g^2*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))])/(d^3*i^2) - (4*b*B^2*(b*c - a*d)*g^2*\text{Log}[a + b*x]*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))])/(d^3*i^2) + (2*b^2*B^2*c*g^2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]/(d^3*i^2) + (4*A*b*B*(b*c - a*d)*g^2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]/(d^3*i^2) + (2*b*B^2*(b*c - a*d)*g^2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]/(d^3*i^2) + (4*b*B^2*(b*c - a*d)*g^2*\text{Log}[(c + d*x)^{-1}]*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]/(d^3*i^2) - (4*b*B^2*(b*c - a*d)*g^2*(\text{Log}[a + b*x] + \text{Log}[(c + d*x)^{-1}] - \text{Log}[(e*(a + b*x))/(c + d*x)])*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]/(d^3*i^2) + (4*b*B^2*(b*c - a*d)*g^2*\text{PolyLog}[3, -((d*(a + b*x))/(b*c - a*d))])/(d^3*i^2) + (4*b*B^2*(b*c - a*d)*g^2*\text{PolyLog}[3, (b*(c + d*x))/(b*c - a*d)]/(d^3*i^2)
\end{aligned}$$

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]
] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

```

### Rule 2523

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] := Simp[x*(a +

```



$b \cdot \text{Log}[c \cdot \text{RFx}^p]^n, x] - \text{Dist}[b \cdot n \cdot p, \text{Int}[\text{SimplifyIntegrand}[(x \cdot (a + b \cdot \text{Log}[c \cdot \text{RFx}^p])^{n-1} \cdot D[\text{RFx}, x]) / \text{RFx}, x], x] /; \text{FreeQ}\{a, b, c, p\}, x] \&\& \text{RationalFunctionQ}[\text{RFx}, x] \&\& \text{IGtQ}[n, 0]$

### Rule 12

$\text{Int}[(a \cdot u), x\_Symbol] \rightarrow \text{Dist}[a, \text{Int}[u, x], x] /; \text{FreeQ}[a, x] \&\& \text{!MatchQ}[u, (b \cdot v) /; \text{FreeQ}[b, x]]$

### Rule 2524

$\text{Int}[(a + \text{Log}[c \cdot (\text{RFx})^p] \cdot (b))^{n-1} / ((d) + (e) \cdot (x)), x\_Symbol] \rightarrow \text{Simp}[(\text{Log}[d + e \cdot x] \cdot (a + b \cdot \text{Log}[c \cdot \text{RFx}^p])^n) / e, x] - \text{Dist}[(b \cdot n \cdot p) / e, \text{Int}[(\text{Log}[d + e \cdot x] \cdot (a + b \cdot \text{Log}[c \cdot \text{RFx}^p])^{n-1} \cdot D[\text{RFx}, x]) / \text{RFx}, x], x] /; \text{FreeQ}\{a, b, c, d, e, p\}, x] \&\& \text{RationalFunctionQ}[\text{RFx}, x] \&\& \text{IGtQ}[n, 0]$

### Rule 2418

$\text{Int}[(a + \text{Log}[c \cdot ((d) + (e) \cdot (x))^{n-1}] \cdot (b))^{p-1} \cdot (\text{RFx}), x\_Symbol] \rightarrow \text{With}\{u = \text{ExpandIntegrand}[(a + b \cdot \text{Log}[c \cdot (d + e \cdot x)^{n-1}])^p, \text{RFx}, x]\}, \text{Int}[u, x] /; \text{SumQ}[u] /; \text{FreeQ}\{a, b, c, d, e, n\}, x] \&\& \text{RationalFunctionQ}[\text{RFx}, x] \&\& \text{IntegerQ}[p]$

### Rule 2390

$\text{Int}[(a + \text{Log}[c \cdot ((d) + (e) \cdot (x))^{n-1}] \cdot (b))^{p-1} \cdot ((f) + (g) \cdot (x))^{q-1}, x\_Symbol] \rightarrow \text{Dist}[1/e, \text{Subst}[\text{Int}[(f \cdot x)/d)^q \cdot (a + b \cdot \text{Log}[c \cdot x^n])^p, x], x, d + e \cdot x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, n, p, q\}, x] \&\& \text{EqQ}[e \cdot f - d \cdot g, 0]$

### Rule 2301

$\text{Int}[(a + \text{Log}[c \cdot (x)^{n-1}] \cdot (b)) / (x), x\_Symbol] \rightarrow \text{Simp}[(a + b \cdot \text{Log}[c \cdot x^n])^2 / (2 \cdot b \cdot n), x] /; \text{FreeQ}\{a, b, c, n\}, x]$

### Rule 2394

$\text{Int}[(a + \text{Log}[c \cdot ((d) + (e) \cdot (x))^{n-1}] \cdot (b)) / ((f) + (g) \cdot (x)), x\_Symbol] \rightarrow \text{Simp}[(\text{Log}[(e \cdot (f + g \cdot x)) / (e \cdot f - d \cdot g)] \cdot (a + b \cdot \text{Log}[c \cdot (d + e \cdot x)^n]) / g, x] - \text{Dist}[(b \cdot e \cdot n) / g, \text{Int}[\text{Log}[(e \cdot (f + g \cdot x)) / (e \cdot f - d \cdot g)] / (d + e \cdot x), x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, n\}, x] \&\& \text{NeQ}[e \cdot f - d \cdot g, 0]$

### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

#### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

#### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

#### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

#### Rule 6688

```
Int[u_, x_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

#### Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

#### Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*(s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))/((j_.) + (k
_.)*(x_)), x_Symbol] := Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n])/(j + k*x),
x)) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
```

$[b*c - a*d, 0]$

### Rule 2433

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_.) + Log[(h\_.)\*((i\_.) + (j\_.)\*(x\_))^(m\_.)]\*(g\_.))\*((k\_.) + (l\_.)\*(x\_))^(r\_.), x\_Symbol] := Dist[1/e, Subst[Int[((k\*x)/d)^r\*(a + b\*Log[c\*x^n])^p\*(f + g\*Log[h\*(e\*i - d\*j)/e + (j\*x)/e]^m)], x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e\*k - d\*l, 0]

### Rule 2375

Int[(Log[(d\_.)\*((e\_) + (f\_.)\*(x\_)^(m\_.))]^(r\_.))\*((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)])\*(b\_.))^(p\_.)/(x\_), x\_Symbol] := Simp[(Log[d\*(e + f\*x^m)^r]\*(a + b\*Log[c\*x^n])^(p + 1))/(b\*n\*(p + 1)), x] - Dist[(f\*m\*r)/(b\*n\*(p + 1)), Int[(x^(m - 1)\*(a + b\*Log[c\*x^n])^(p + 1))/(e + f\*x^m), x], x] /; FreeQ[{a, b, c, d, e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d\*e, 1]

### Rule 2317

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/((d\_) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^p)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

### Rule 2374

Int[(Log[(d\_.)\*((e\_) + (f\_.)\*(x\_)^(m\_.))]^(p\_.))\*((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/(x\_), x\_Symbol] := -Simp[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^p)/m, x] + Dist[(b\*n\*p)/m, Int[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0] && EqQ[d\*e, 1]

### Rule 6589

Int[PolyLog[n\_, (c\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)]/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] := Simp[PolyLog[n + 1, c\*(a + b\*x)^p]/(e\*p), x] /; FreeQ[{a, b, c, d, e, n, p}, x] && EqQ[b\*d, a\*e]

### Rule 2440

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))\*((f\_.) + Log[(h\_.)\*((i\_.) + (j\_.)\*(x\_))^(m\_.)]\*(g\_.))\*((k\_.) + (l\_.)\*(x\_))^(r\_.), x\_Symbol] := Dist[1/l, Subst[Int[x^r\*(a + b\*Log[c\*(-((e\*k - d\*l)/l) + (e\*x)/l)^n]\*(f + g\*Log[h\*(-((j\*k - i\*l)/l) + (j\*x)/l)^m)], x], x, k + l\*x], x] /; FreeQ[{a,

b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]

### Rule 2434

Int[(((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))\*((f\_.) + Log[(h\_.)\*(i\_.) + (j\_.)\*(x\_)]^(m\_.)]\*(g\_.)))/(x\_), x\_Symbol] :> Simp[Log[x]\*(a + b\*Log[c\*(d + e\*x)^n])\*(f + g\*Log[h\*(i + j\*x)^m]), x] + (-Dist[e\*g\*m, Int[(Log[x]\*(a + b\*Log[c\*(d + e\*x)^n])]/(d + e\*x), x], x] - Dist[b\*j\*n, Int[(Log[x]\*(f + g\*Log[h\*(i + j\*x)^m])]/(i + j\*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, m, n}, x] && EqQ[e\*i - d\*j, 0]

### Rule 2499

Int[(Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.))]^(r\_.)]\*((s\_.) + Log[(i\_.)\*((g\_.) + (h\_.)\*(x\_))^(n\_.)]\*(t\_.))^(m\_.))/((j\_.) + (k\_.)\*(x\_)), x\_Symbol] :> Simp[((s + t\*Log[i\*(g + h\*x)^n])^(m + 1)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q])^r]/(k\*n\*t\*(m + 1)), x] + (-Dist[(b\*p\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(a + b\*x), x], x] - Dist[(d\*q\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(c + d\*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0] && EqQ[h\*j - g\*k, 0] && IGtQ[m, 0]

### Rule 2396

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :> Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])^p)/g, x] - Dist[(b\*e\*n\*p)/g, Int[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])^(p - 1))/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p}, x] && NeQ[e\*f - d\*g, 0] && IGtQ[p, 1]

### Rule 2302

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_))/(x\_), x\_Symbol] :> Dist[1/(b\*n), Subst[Int[x^p, x], x, a + b\*Log[c\*x^n]], x] /; FreeQ[{a, b, c, n, p}, x]

### Rule 30

Int[(x\_)^(m\_.), x\_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && NeQ[m, -1]

### Rubi steps

$$\begin{aligned}
\int \frac{(ag + bgx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(93c + 93dx)^2} dx &= \int \left( \frac{b^2 g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{8649d^2} + \frac{(-bc + ad)^2 g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{8649d^2(c + dx)^2} - \frac{2b(bc - ad)g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{8649d^2(c + dx)^2} \right) dx \\
&= \frac{(b^2 g^2) \int \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{8649d^2} - \frac{(2b(bc - ad)g^2) \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{c+dx}}{8649d^2} \\
&= \frac{b^2 g^2 x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{8649d^2} - \frac{(bc - ad)^2 g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{8649d^3(c + dx)} - \frac{2b(bc - ad)g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{8649d^3(c + dx)} \\
&= \frac{b^2 g^2 x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{8649d^2} - \frac{(bc - ad)^2 g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{8649d^3(c + dx)} - \frac{2b(bc - ad)g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{8649d^3(c + dx)} \\
&= \frac{b^2 g^2 x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{8649d^2} - \frac{(bc - ad)^2 g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{8649d^3(c + dx)} - \frac{2b(bc - ad)g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{8649d^3(c + dx)} \\
&= \frac{2B(bc - ad)^2 g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{8649d^3(c + dx)} + \frac{2abB g^2 \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{8649d^2} \\
&= \frac{2B(bc - ad)^2 g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{8649d^3(c + dx)} + \frac{2abB g^2 \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{8649d^2} \\
&= \frac{2B(bc - ad)^2 g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{8649d^3(c + dx)} + \frac{2abB g^2 \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{8649d^2} \\
&= -\frac{2B^2(bc - ad)^2 g^2}{8649d^3(c + dx)} - \frac{2bB^2(bc - ad)g^2 \log(a + bx)}{8649d^3} + \frac{2B(bc - ad)^2 g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{8649d^3(c + dx)} \\
&= -\frac{2B^2(bc - ad)^2 g^2}{8649d^3(c + dx)} - \frac{2bB^2(bc - ad)g^2 \log(a + bx)}{8649d^3} + \frac{2B(bc - ad)^2 g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{8649d^3(c + dx)} \\
&= -\frac{2B^2(bc - ad)^2 g^2}{8649d^3(c + dx)} - \frac{2bB^2(bc - ad)g^2 \log(a + bx)}{8649d^3} - \frac{abB^2 g^2 \log^2(a + bx)}{8649d^2} - \frac{b^2 B^2 g^2 \log^2(a + bx)}{8649d^2} \\
&= -\frac{2B^2(bc - ad)^2 g^2}{8649d^3(c + dx)} - \frac{2bB^2(bc - ad)g^2 \log(a + bx)}{8649d^3} - \frac{abB^2 g^2 \log^2(a + bx)}{8649d^2} - \frac{b^2 B^2 g^2 \log^2(a + bx)}{8649d^2}
\end{aligned}$$

**Mathematica [B]** time = 4.67378, size = 1969, normalized size = 4.2

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(c*i + d
*i*x)^2,x]
```

```
[Out] (g^2*(A^2*b^2*d*x - (A^2*(b*c - a*d)^2)/(c + d*x) + 2*A^2*b*(-(b*c) + a*d)*
Log[c + d*x] + (2*a^2*A*B*d^2*(b*c - a*d + b*(c + d*x)*Log[a/b + x] + (-(b*
c) + a*d)*Log[(e*(a + b*x))/(c + d*x)] - b*c*Log[(b*(c + d*x))/(b*c - a*d)]
- b*d*x*Log[(b*(c + d*x))/(b*c - a*d)]))/((b*c - a*d)*(c + d*x)) + 2*a*A*b
*B*d*(-Log[c/d + x]^2 + 2*Log[c/d + x]*Log[c + d*x] + 2*(-(c/(c + d*x)) + (
b*c*Log[a + b*x])/(-(b*c) + a*d) + (b*c*Log[c + d*x])/(b*c - a*d) - Log[a/b
+ x]*Log[c + d*x] + Log[(e*(a + b*x))/(c + d*x)]*(c/(c + d*x) + Log[c + d
x]) + Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)]) + 2*PolyLog[2, (d*(a + b
*x))/(-(b*c) + a*d)]) + 2*A*b^2*B*(d*(a/b + x)*(-1 + Log[a/b + x]) - (c^2*L
og[a/b + x])/(c + d*x) - (c + d*x)*(-1 + Log[c/d + x]) + c*Log[c/d + x]^2 +
(c^2*(1 + Log[c/d + x]))/(c + d*x) + (b*c^2*(Log[a + b*x] - Log[c + d*x]))
/(b*c - a*d) + (-Log[a/b + x] + Log[c/d + x] + Log[(e*(a + b*x))/(c + d*x]
))*(d*x - c^2/(c + d*x) - 2*c*Log[c + d*x]) - 2*c*(Log[a/b + x]*Log[(b*(c +
d*x))/(b*c - a*d)] + PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - (a^2*B^2*
d^2*(2*b*c - 2*a*d + 2*b*(c + d*x)*Log[a + b*x] - 2*(b*c - a*d)*Log[(e*(a +
b*x))/(c + d*x)] - 2*b*(c + d*x)*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)]
+ (b*c - a*d)*Log[(e*(a + b*x))/(c + d*x)]^2 - 2*b*(c + d*x)*Log[c + d*x]
- 2*b*(c + d*x)*Log[(e*(a + b*x))/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)]
+ b*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d]
])) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)] + b*(c + d*x)*(Log[(b*c -
a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)
/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/((b*c - a*d)*
(c + d*x)) + b^2*B^2*((d*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)]^2)/b - (c^2
*Log[(e*(a + b*x))/(c + d*x)]^2)/(c + d*x) + 2*c*Log[(e*(a + b*x))/(c + d*x
)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] - (c^2*(2*b*c - 2*a*d + 2*b*(c + d*x)*L
og[a + b*x] - 2*(b*c - a*d)*Log[(e*(a + b*x))/(c + d*x)] - 2*b*(c + d*x)*Lo
g[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] - 2*b*(c + d*x)*Log[c + d*x] - 2*b*
(c + d*x)*Log[(e*(a + b*x))/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + b*(
c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d])) -
2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)] + b*(c + d*x)*(Log[(b*c - a*d)/
(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c
+ b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/((b*c - a*d)*(c + d
*x)) - ((b*c - a*d)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-
(b*c) + a*d)] - 2*Log[(e*(a + b*x))/(c + d*x)] + Log[(b*c - a*d)/(b*c + b*d
*x])) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/b + 4*c*(Log[(e*(a + b*x)
```

)/(c + d\*x))\*PolyLog[2, (d\*(a + b\*x))/(b\*(c + d\*x))] - PolyLog[3, (d\*(a + b\*x))/(b\*(c + d\*x))]) + 2\*a\*b\*B^2\*d\*((c\*Log[(e\*(a + b\*x))/(c + d\*x)]^2)/(c + d\*x) - Log[(e\*(a + b\*x))/(c + d\*x)]^2\*Log[(b\*c - a\*d)/(b\*c + b\*d\*x)] - 2\*Log[(e\*(a + b\*x))/(c + d\*x)]\*PolyLog[2, (d\*(a + b\*x))/(b\*(c + d\*x))] + (c\*(2\*b\*c - 2\*a\*d + 2\*b\*(c + d\*x)\*Log[a + b\*x] - 2\*(b\*c - a\*d)\*Log[(e\*(a + b\*x))/(c + d\*x)] - 2\*b\*(c + d\*x)\*Log[a + b\*x]\*Log[(e\*(a + b\*x))/(c + d\*x)] - 2\*b\*(c + d\*x)\*Log[c + d\*x] - 2\*b\*(c + d\*x)\*Log[(e\*(a + b\*x))/(c + d\*x)]\*Log[(b\*c - a\*d)/(b\*c + b\*d\*x)] + b\*(c + d\*x)\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]) - 2\*PolyLog[2, (d\*(a + b\*x))/(-b\*c) + a\*d]) + b\*(c + d\*x)\*(Log[(b\*c - a\*d)/(b\*c + b\*d\*x)]\*(2\*Log[(d\*(a + b\*x))/(-b\*c) + a\*d]) + Log[(b\*c - a\*d)/(b\*c + b\*d\*x)]) - 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])))/(b\*c - a\*d)\*(c + d\*x)) + 2\*PolyLog[3, (d\*(a + b\*x))/(b\*(c + d\*x))])/(d^3\*i^2)

**Maple [F]** time = 2.125, size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^2}{(dix + ci)^2} \left( A + B \ln \left( \frac{e(bx + a)}{dx + c} \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^2\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i)^2,x)

[Out] int((b\*g\*x+a\*g)^2\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i)^2,x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i)^2,x, algorithm="maxima")

[Out] -A^2\*b^2\*(c^2/(d^4\*i^2\*x + c\*d^3\*i^2) - x/(d^2\*i^2) + 2\*c\*log(d\*x + c)/(d^3\*i^2))\*g^2 + 2\*A^2\*a\*b\*g^2\*(c/(d^3\*i^2\*x + c\*d^2\*i^2) + log(d\*x + c)/(d^2\*i^2)) - 2\*A\*B\*a^2\*g^2\*(log(b\*e\*x/(d\*x + c) + a\*e/(d\*x + c))/(d^2\*i^2\*x + c\*d\*i^2) - 1/(d^2\*i^2\*x + c\*d\*i^2) - b\*log(b\*x + a)/((b\*c\*d - a\*d^2)\*i^2) + b\*log(d\*x + c)/((b\*c\*d - a\*d^2)\*i^2)) - A^2\*a^2\*g^2/(d^2\*i^2\*x + c\*d\*i^2) - 1

$$\begin{aligned} & /3*(2*((b^2*c*d*g^2 - a*b*d^2*g^2)*B^2*x + (b^2*c^2*g^2 - a*b*c*d*g^2)*B^2) \\ & * \log(d*x + c)^3 - 3*(B^2*b^2*d^2*g^2*x^2 + B^2*b^2*c*d*g^2*x - (b^2*c^2*g^2 \\ & - 2*a*b*c*d*g^2 + a^2*d^2*g^2)*B^2)* \log(d*x + c)^2)/(d^4*i^2*x + c*d^3*i^2) \\ & ) - \text{integrate}(- (B^2*a^2*d^2*g^2*\log(e)^2 + (B^2*b^2*d^2*g^2*\log(e)^2 + 2*A*B \\ & *B*b^2*d^2*g^2*\log(e))*x^2 + (B^2*b^2*d^2*g^2*x^2 + 2*B^2*a*b*d^2*g^2*x + B^2 \\ & *a^2*d^2*g^2)*\log(b*x + a)^2 + 2*(B^2*a*b*d^2*g^2*\log(e)^2 + 2*A*B*a*b*d^2 \\ & *g^2*\log(e))*x + 2*(B^2*a^2*d^2*g^2*\log(e) + (B^2*b^2*d^2*g^2*\log(e) + A*B \\ & *b^2*d^2*g^2)*x^2 + 2*(B^2*a*b*d^2*g^2*\log(e) + A*B*a*b*d^2*g^2)*x)* \log(b*x \\ & + a) + 2*((b^2*c^2*g^2 - 2*a*b*c*d*g^2 - (g^2*\log(e) - g^2)*a^2*d^2)*B^2 - \\ & (A*B*b^2*d^2*g^2 + (g^2*\log(e) + g^2)*B^2*b^2*d^2)*x^2 - (2*A*B*a*b*d^2*g^2 \\ & + (2*a*b*d^2*g^2*\log(e) + b^2*c*d*g^2)*B^2)*x - (B^2*b^2*d^2*g^2*x^2 + 2*B \\ & ^2*a*b*d^2*g^2*x + B^2*a^2*d^2*g^2)*\log(b*x + a))* \log(d*x + c))/(d^4*i^2*x^2 \\ & + 2*c*d^3*i^2*x + c^2*d^2*i^2), x \end{aligned}$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{A^2 b^2 g^2 x^2 + 2 A^2 a b g^2 x + A^2 a^2 g^2 + (B^2 b^2 g^2 x^2 + 2 B^2 a b g^2 x + B^2 a^2 g^2) \log\left(\frac{bex+ae}{dx+c}\right)^2 + 2 (A B b^2 g^2 x^2 + 2 A B a b g^2 x + A^2 a^2 g^2) \log\left(\frac{bex+ae}{dx+c}\right)}{d^2 i^2 x^2 + 2 c d i^2 x + c^2 i^2}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i)^2,x, algorithm="fricas")

[Out] integral((A^2\*b^2\*g^2\*x^2 + 2\*A^2\*a\*b\*g^2\*x + A^2\*a^2\*g^2 + (B^2\*b^2\*g^2\*x^2 + 2\*B^2\*a\*b\*g^2\*x + B^2\*a^2\*g^2)\*log((b\*e\*x + a\*e)/(d\*x + c))^2 + 2\*(A\*B\*b^2\*g^2\*x^2 + 2\*A\*B\*a\*b\*g^2\*x + A\*B\*a^2\*g^2)\*log((b\*e\*x + a\*e)/(d\*x + c)))/(d^2\*i^2\*x^2 + 2\*c\*d\*i^2\*x + c^2\*i^2), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*\*2\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))\*\*2/(d\*i\*x+c\*i)\*\*2,x)

[Out] Timed out



---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^2 \left( B \log \left( \frac{(bx+a)e}{dx+c} \right) + A \right)^2}{(dix + ci)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i)^2,x, algorithm="giac")

[Out] integrate((b\*g\*x + a\*g)^2\*(B\*log((b\*x + a)\*e/(d\*x + c)) + A)^2/(d\*i\*x + c\*i)^2, x)

$$3.94 \quad \int \frac{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ci+dix)^2} dx$$

**Optimal.** Leaf size=261

$$\frac{2bBg\text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{d^2i^2} + \frac{2bB^2g\text{PolyLog}\left(3, \frac{d(a+bx)}{b(c+dx)}\right)}{d^2i^2} - \frac{bg\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)^2}{d^2i^2}$$

[Out] (2\*A\*B\*g\*(a + b\*x))/(d\*i^2\*(c + d\*x)) - (2\*B^2\*g\*(a + b\*x))/(d\*i^2\*(c + d\*x)) + (2\*B^2\*g\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x)]/(d\*i^2\*(c + d\*x)) - (g\*(a + b\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))^2)/(d\*i^2\*(c + d\*x)) - (b\*g\*Log[(b\*c - a\*d)/(b\*(c + d\*x))]\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))^2)/(d^2\*i^2) - (2\*b\*B\*g\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))\*PolyLog[2, (d\*(a + b\*x))/(b\*(c + d\*x))])/(d^2\*i^2) + (2\*b\*B^2\*g\*PolyLog[3, (d\*(a + b\*x))/(b\*(c + d\*x))])/(d^2\*i^2)

**Rubi [B]** time = 4.24162, antiderivative size = 1060, normalized size of antiderivative = 4.06, number of steps used = 72, number of rules used = 25, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.625$ , Rules used = {2528, 2525, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 44, 6688, 6742, 2500, 2433, 2375, 2317, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

$$\frac{bB^2g\log^3(c+dx)}{3d^2i^2} - \frac{bB^2g\log(a+bx)\log^2(c+dx)}{d^2i^2} + \frac{bB^2g\log\left(\frac{e(a+bx)}{c+dx}\right)\log^2(c+dx)}{d^2i^2} + \frac{bB^2g\log^2(c+dx)}{d^2i^2} + \frac{AbBg\log^2(c+dx)}{d^2i^2}$$

Antiderivative was successfully verified.

[In] Int[((a\*g + b\*g\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))^2)/(c\*i + d\*i\*x)^2, x]

[Out] (2\*B^2\*(b\*c - a\*d)\*g)/(d^2\*i^2\*(c + d\*x)) + (2\*b\*B^2\*g\*Log[a + b\*x])/(d^2\*i^2) + (b\*B^2\*g\*Log[a + b\*x]^2)/(d^2\*i^2) - (b\*B^2\*g\*Log[a + b\*x]\*Log[(c + d\*x)^(-1)]^2)/(d^2\*i^2) + (b\*B^2\*g\*Log[-((d\*(a + b\*x))/(b\*c - a\*d))]\*Log[(c + d\*x)^(-1)]^2)/(d^2\*i^2) - (2\*B\*(b\*c - a\*d)\*g\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))/(d^2\*i^2\*(c + d\*x)) - (2\*b\*B\*g\*Log[a + b\*x]\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))/(d^2\*i^2) + ((b\*c - a\*d)\*g\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))^2)/(d^2\*i^2\*(c + d\*x)) - (2\*b\*B^2\*g\*Log[c + d\*x])/(d^2\*i^2) - (b\*B^2\*g\*Log[a + b\*x]^2\*Log[c + d\*x])/(d^2\*i^2) - (2\*A\*b\*B\*g\*Log[-((d\*(a + b\*x))/(b\*c - a\*d))]\*Log[c + d\*x])/(d^2\*i^2) - (2\*b\*B^2\*g\*Log[-((d\*(a + b\*x))/(b\*c - a\*d))]\*Log[c + d\*x])/(d^2\*i^2) - (2\*b\*B^2\*g\*Log[a + b\*x]\*Log[(c + d\*x)^(-1)]^2)/(d^2\*i^2)

```

1)]*Log[c + d*x]/(d^2*i^2) + (2*b*B^2*g*Log[-((d*(a + b*x))/(b*c - a*d))]*
(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*Log[c +
d*x]/(d^2*i^2) + (2*b*B*g*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*
x]/(d^2*i^2) + (b*g*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2*Log[c + d*x]/(
d^2*i^2) + (A*b*B*g*Log[c + d*x]^2)/(d^2*i^2) + (b*B^2*g*Log[c + d*x]^2)/(d
^2*i^2) - (b*B^2*g*Log[a + b*x]*Log[c + d*x]^2)/(d^2*i^2) + (b*B^2*g*Log[(e
*(a + b*x))/(c + d*x])*Log[c + d*x]^2)/(d^2*i^2) + (b*B^2*g*Log[c + d*x]^3
)/(3*d^2*i^2) - (2*b*B^2*g*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(d^2
*i^2) + (b*B^2*g*Log[a + b*x]^2*Log[(b*(c + d*x))/(b*c - a*d)])/(d^2*i^2) -
(2*b*B^2*g*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))]/(d^2*i^2) + (2*b*B^2*
g*Log[a + b*x]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))]/(d^2*i^2) - (2*A*b
*B*g*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^2*i^2) - (2*b*B^2*g*PolyLog[
2, (b*(c + d*x))/(b*c - a*d)])/(d^2*i^2) - (2*b*B^2*g*Log[(c + d*x)^(-1)]*P
olyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^2*i^2) + (2*b*B^2*g*(Log[a + b*x]
+ Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (b*(c + d*
x))/(b*c - a*d)])/(d^2*i^2) - (2*b*B^2*g*PolyLog[3, -((d*(a + b*x))/(b*c -
a*d))]/(d^2*i^2) - (2*b*B^2*g*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])/(d^2*
i^2)

```

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFX^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFX, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]

```

### Rule 2525

```

Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]

```

### Rule 12

```

Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]

```

### Rule 2524

```

Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFX^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x] /;

```

FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

#### Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*(RFx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]

#### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.)\*(x\_))^(q\_.), x\_Symbol] := Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

#### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] := Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

#### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n]))/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

#### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

#### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] := -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

#### Rule 44

Int[((a\_) + (b\_.)\*(x\_))^(m\_.)\*((c\_.) + (d\_.)\*(x\_))^(n\_.), x\_Symbol] := Int[ExpandIntegrand[(a + b\*x)^m\*(c + d\*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b\*c - a\*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m

+ n + 2, 0])

### Rule 6688

Int[u\_, x\_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifyIntegrandQ[v, u, x]]

### Rule 6742

Int[u\_, x\_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]

### Rule 2500

Int[(Log[(e\_.)\*((f\_.)\*(a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.)]^(r\_.))\*((s\_.) + Log[(i\_.)\*(g\_.) + (h\_.)\*(x\_)]^(n\_.))\*(t\_.))/((j\_.) + (k\_.)\*(x\_)), x\_Symbol] := Dist[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q)^r] - Log[(a + b\*x)^(p\*r)] - Log[(c + d\*x)^(q\*r)], Int[(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x], x] + (Int[(Log[(a + b\*x)^(p\*r)]\*(s + t\*Log[i\*(g + h\*x)^n]))/(j + k\*x), x] + Int[(Log[(c + d\*x)^(q\*r)]\*(s + t\*Log[i\*(g + h\*x)^n]))/(j + k\*x), x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0]

### Rule 2433

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_.) + Log[(h\_.)\*((i\_.) + (j\_.)\*(x\_))^(m\_.)]\*(g\_.))\*((k\_.) + (l\_.)\*(x\_))^(r\_.), x\_Symbol] := Dist[1/e, Subst[Int[((k\*x)/d)^r\*(a + b\*Log[c\*x^n])^p\*(f + g\*Log[h\*(e\*i - d\*j)/e + (j\*x)/e]^m)], x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e\*k - d\*l, 0]

### Rule 2375

Int[(Log[(d\_.)\*((e\_) + (f\_.)\*(x\_))^(m\_.)]^(r\_.))\*((a\_.) + Log[(c\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)/(x\_), x\_Symbol] := Simp[(Log[d\*(e + f\*x^m)^r]\*(a + b\*Log[c\*x^n])^(p + 1))/(b\*n\*(p + 1)), x] - Dist[(f\*m\*r)/(b\*n\*(p + 1)), Int[(x^(m - 1)\*(a + b\*Log[c\*x^n])^(p + 1))/(e + f\*x^m), x], x] /; FreeQ[{a, b, c, d, e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d\*e, 1]

### Rule 2317

Int[((a\_.) + Log[(c\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)/((d\_) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^p)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b

, c, d, e, n}, x] && IGtQ[p, 0]

#### Rule 2374

Int[(Log[(d\_.)\*((e\_.) + (f\_.)\*(x\_)^(m\_.))]\*((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.))/(x\_), x\_Symbol] :> -Simp[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^p)/m, x] + Dist[(b\*n\*p)/m, Int[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0] && EqQ[d\*e, 1]

#### Rule 6589

Int[PolyLog[n\_, (c\_.)\*((a\_.) + (b\_.)\*(x\_)^(p\_.))]/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] :> Simp[PolyLog[n + 1, c\*(a + b\*x)^p]/(e\*p), x] /; FreeQ[{a, b, c, d, e, n, p}, x] && EqQ[b\*d, a\*e]

#### Rule 2440

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]\*(b\_.))\*((f\_.) + Log[(h\_.)\*((i\_.) + (j\_.)\*(x\_)^(m\_.))]\*(g\_.))\*((k\_) + (l\_.)\*(x\_)^(r\_.), x\_Symbol] :> Dist[1/l, Subst[Int[x^r\*(a + b\*Log[c\*(-((e\*k - d\*1)/1) + (e\*x)/1)^n])\*(f + g\*Log[h\*(-((j\*k - i\*1)/1) + (j\*x)/1)^m]), x], x, k + l\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]

#### Rule 2434

Int[(((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]\*(b\_.))\*((f\_.) + Log[(h\_.)\*((i\_.) + (j\_.)\*(x\_)^(m\_.))]\*(g\_.)))/(x\_), x\_Symbol] :> Simp[Log[x]\*(a + b\*Log[c\*(d + e\*x)^n])\*(f + g\*Log[h\*(i + j\*x)^m]), x] + (-Dist[e\*g\*m, Int[(Log[x]\*(a + b\*Log[c\*(d + e\*x)^n])]/(d + e\*x), x], x] - Dist[b\*j\*n, Int[(Log[x]\*(f + g\*Log[h\*(i + j\*x)^m])]/(i + j\*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, m, n}, x] && EqQ[e\*i - d\*j, 0]

#### Rule 2499

Int[(Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_)^(p\_.))\*((c\_.) + (d\_.)\*(x\_)^(q\_.))^(r\_.)]\*((s\_.) + Log[(i\_.)\*((g\_.) + (h\_.)\*(x\_)^(n\_.))]\*(t\_.))^(m\_.))/(j\_.) + (k\_.)\*(x\_)), x\_Symbol] :> Simp[((s + t\*Log[i\*(g + h\*x)^n])^(m + 1)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r)/(k\*n\*t\*(m + 1)), x] + (-Dist[(b\*p\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(a + b\*x), x], x] - Dist[(d\*q\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(c + d\*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0] && EqQ[h\*j - g\*k, 0] && IGtQ[m, 0]

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] := Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] := Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{(ag + bgx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(94c + 94dx)^2} dx &= \int \left( \frac{(-bc + ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{8836d(c + dx)^2} + \frac{bg \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{8836d(c + dx)} \right) dx \\
&= \frac{(bg) \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{c+dx} dx}{8836d} - \frac{((bc - ad)g) \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(c+dx)^2} dx}{8836d} \\
&= \frac{(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{8836d^2(c + dx)} + \frac{bg \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 \log(c + dx)}{8836d^2} \quad (bE) \\
&= \frac{(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{8836d^2(c + dx)} + \frac{bg \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 \log(c + dx)}{8836d^2} \quad (B) \\
&= \frac{(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{8836d^2(c + dx)} + \frac{bg \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 \log(c + dx)}{8836d^2} \quad (B) \\
&= \frac{(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{8836d^2(c + dx)} + \frac{bg \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 \log(c + dx)}{8836d^2} \quad (b^2) \\
&= -\frac{B(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{4418d^2(c + dx)} - \frac{bBg \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{4418d^2} + \dots \\
&= -\frac{B(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{4418d^2(c + dx)} - \frac{bBg \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{4418d^2} + \dots \\
&= -\frac{B(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{4418d^2(c + dx)} - \frac{bBg \log(a + bx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{4418d^2} + \dots \\
&= \frac{B^2(bc - ad)g}{4418d^2(c + dx)} + \frac{bB^2g \log(a + bx)}{4418d^2} - \frac{B(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{4418d^2(c + dx)} - \frac{bBg}{4418d^2} \\
&= \frac{B^2(bc - ad)g}{4418d^2(c + dx)} + \frac{bB^2g \log(a + bx)}{4418d^2} - \frac{B(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{4418d^2(c + dx)} - \frac{bBg}{4418d^2} \\
&= \frac{B^2(bc - ad)g}{4418d^2(c + dx)} + \frac{bB^2g \log(a + bx)}{4418d^2} + \frac{bB^2g \log^2(a + bx)}{8836d^2} - \frac{B(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{4418d^2(c + dx)} \\
&= \frac{B^2(bc - ad)g}{4418d^2(c + dx)} + \frac{bB^2g \log(a + bx)}{4418d^2} + \frac{bB^2g \log^2(a + bx)}{8836d^2} - \frac{B(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{4418d^2(c + dx)}
\end{aligned}$$



**Mathematica [B]** time = 1.90629, size = 1107, normalized size = 4.24

$$g \left( b \log(c + dx) A^2 + \frac{(bc-ad)A^2}{c+dx} + \frac{2aBd \left( bc - b \log\left(\frac{b(c+dx)}{bc-ad}\right) c - ad + b(c+dx) \log\left(\frac{a}{b} + x\right) + (ad-bc) \log\left(\frac{c(a+bx)}{c+dx}\right) - bdx \log\left(\frac{b(c+dx)}{bc-ad}\right) \right) A}{(bc-ad)(c+dx)} + bB \left( -\log^2\left(\frac{c}{d} + \right) \right. \right.$$

Antiderivative was successfully verified.

[In] Integrate[((a\*g + b\*g\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2)/(c\*i + d\*i\*x)^2,x]

[Out] (g\*((A^2\*(b\*c - a\*d))/(c + d\*x) + A^2\*b\*Log[c + d\*x] + (2\*a\*A\*B\*d\*(b\*c - a\*d + b\*(c + d\*x)\*Log[a/b + x] + (-b\*c) + a\*d)\*Log[(e\*(a + b\*x))/(c + d\*x)] - b\*c\*Log[(b\*(c + d\*x))/(b\*c - a\*d)] - b\*d\*x\*Log[(b\*(c + d\*x))/(b\*c - a\*d] ))/((b\*c - a\*d)\*(c + d\*x)) + A\*b\*B\*(-Log[c/d + x]^2 + 2\*Log[c/d + x]\*Log[c + d\*x] + 2\*(-c/(c + d\*x)) + (b\*c\*Log[a + b\*x])/(-b\*c) + a\*d) + (b\*c\*Log[c + d\*x])/(b\*c - a\*d) - Log[a/b + x]\*Log[c + d\*x] + Log[(e\*(a + b\*x))/(c + d\*x)]\*(c/(c + d\*x) + Log[c + d\*x]) + Log[a/b + x]\*Log[(b\*(c + d\*x))/(b\*c - a\*d)] + 2\*PolyLog[2, (d\*(a + b\*x))/(-b\*c) + a\*d]) - (a\*B^2\*d\*(2\*b\*c - 2\*a\*d + 2\*b\*(c + d\*x)\*Log[a + b\*x] - 2\*(b\*c - a\*d)\*Log[(e\*(a + b\*x))/(c + d\*x)] - 2\*b\*(c + d\*x)\*Log[a + b\*x]\*Log[(e\*(a + b\*x))/(c + d\*x)] + (b\*c - a\*d)\*Log[(e\*(a + b\*x))/(c + d\*x)]^2 - 2\*b\*(c + d\*x)\*Log[c + d\*x] - 2\*b\*(c + d\*x)\*Log[(e\*(a + b\*x))/(c + d\*x)]\*Log[(b\*c - a\*d)/(b\*c + b\*d\*x)] + b\*(c + d\*x)\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d])) - 2\*PolyLog[2, (d\*(a + b\*x))/(-b\*c) + a\*d]) + b\*(c + d\*x)\*(Log[(b\*c - a\*d)/(b\*c + b\*d\*x)]\*(2\*Log[(d\*(a + b\*x))/(-b\*c) + a\*d]) + Log[(b\*c - a\*d)/(b\*c + b\*d\*x)]) - 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d])]))/(b\*c - a\*d)\*(c + d\*x)) + b\*B^2\*((c\*Log[(e\*(a + b\*x))/(c + d\*x)]^2)/(c + d\*x) - Log[(e\*(a + b\*x))/(c + d\*x)]^2\*Log[(b\*c - a\*d)/(b\*c + b\*d\*x)] - 2\*Log[(e\*(a + b\*x))/(c + d\*x)]\*PolyLog[2, (d\*(a + b\*x))/(b\*(c + d\*x))] + (c\*(2\*b\*c - 2\*a\*d + 2\*b\*(c + d\*x)\*Log[a + b\*x] - 2\*(b\*c - a\*d)\*Log[(e\*(a + b\*x))/(c + d\*x)] - 2\*b\*(c + d\*x)\*Log[a + b\*x]\*Log[(e\*(a + b\*x))/(c + d\*x)] - 2\*b\*(c + d\*x)\*Log[c + d\*x] - 2\*b\*(c + d\*x)\*Log[(e\*(a + b\*x))/(c + d\*x)]\*Log[(b\*c - a\*d)/(b\*c + b\*d\*x)] + b\*(c + d\*x)\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d])) - 2\*PolyLog[2, (d\*(a + b\*x))/(-b\*c) + a\*d]) + b\*(c + d\*x)\*(Log[(b\*c - a\*d)/(b\*c + b\*d\*x)]\*(2\*Log[(d\*(a + b\*x))/(-b\*c) + a\*d]) + Log[(b\*c - a\*d)/(b\*c + b\*d\*x)]) - 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d])]))/(d^2\*i^2)

**Maple [F]** time = 1.969, size = 0, normalized size = 0.

$$\int \frac{bgx + ag}{(dix + ci)^2} \left( A + B \ln \left( \frac{e(bx + a)}{dx + c} \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i)^2,x)

[Out] int((b\*g\*x+a\*g)\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i)^2,x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$A^2bg \left( \frac{c}{d^3i^2x + cd^2i^2} + \frac{\log(dx + c)}{d^2i^2} \right) - 2ABag \left( \frac{\log\left(\frac{bex}{dx+c} + \frac{ae}{dx+c}\right)}{d^2i^2x + cdi^2} - \frac{1}{d^2i^2x + cdi^2} - \frac{b \log(bx + a)}{(bcd - ad^2)i^2} + \frac{b \log(dx + c)}{(bcd - ad^2)i^2} \right) - \frac{A}{d^2i^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i)^2,x, algorithm="maxima")

[Out] A^2\*b\*g\*(c/(d^3\*i^2\*x + c\*d^2\*i^2) + log(d\*x + c)/(d^2\*i^2)) - 2\*A\*B\*a\*g\*(log(b\*e\*x/(d\*x + c) + a\*e/(d\*x + c))/(d^2\*i^2\*x + c\*d\*i^2) - 1/(d^2\*i^2\*x + c\*d\*i^2) - b\*log(b\*x + a)/((b\*c\*d - a\*d^2)\*i^2) + b\*log(d\*x + c)/((b\*c\*d - a\*d^2)\*i^2)) - A^2\*a\*g/(d^2\*i^2\*x + c\*d\*i^2) + 1/3\*(3\*(b\*c\*g - a\*d\*g)\*B^2\*log(d\*x + c)^2 + (B^2\*b\*d\*g\*x + B^2\*b\*c\*g)\*log(d\*x + c)^3)/(d^3\*i^2\*x + c\*d^2\*i^2) - integrate(-(B^2\*a\*d\*g\*log(e)^2 + (B^2\*b\*d\*g\*x + B^2\*a\*d\*g)\*log(b\*x + a)^2 + (B^2\*b\*d\*g\*log(e)^2 + 2\*A\*B\*b\*d\*g\*log(e))\*x + 2\*(B^2\*a\*d\*g\*log(e) + (B^2\*b\*d\*g\*log(e) + A\*B\*b\*d\*g)\*x)\*log(b\*x + a) - 2\*((g\*log(e) - g)\*a\*d + b\*c\*g)\*B^2 + (B^2\*b\*d\*g\*log(e) + A\*B\*b\*d\*g)\*x + (B^2\*b\*d\*g\*x + B^2\*a\*d\*g)\*log(b\*x + a))\*log(d\*x + c)/(d^3\*i^2\*x^2 + 2\*c\*d^2\*i^2\*x + c^2\*d\*i^2), x)

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{A^2bgx + A^2ag + (B^2bgx + B^2ag) \log\left(\frac{bex+ae}{dx+c}\right)^2 + 2(ABbgx + ABag) \log\left(\frac{bex+ae}{dx+c}\right)}{d^2i^2x^2 + 2cdi^2x + c^2i^2}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x, algorithm="fricas")
```

```
[Out] integral((A^2*b*g*x + A^2*a*g + (B^2*b*g*x + B^2*a*g)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*b*g*x + A*B*a*g)*log((b*e*x + a*e)/(d*x + c)))/(d^2*i^2*x^2 + 2*c*d*i^2*x + c^2*i^2), x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c)))**2/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag) \left( B \log \left( \frac{(bx+a)e}{dx+c} \right) + A \right)^2}{(dix + ci)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(d*i*x + c*i)^2, x)
```

$$3.95 \quad \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ci+dx)^2} dx$$

**Optimal.** Leaf size=152

$$\frac{(a+bx)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)^2}{i^2(c+dx)(bc-ad)} - \frac{2AB(a+bx)}{i^2(c+dx)(bc-ad)} - \frac{2B^2(a+bx) \log\left(\frac{e(a+bx)}{c+dx}\right)}{i^2(c+dx)(bc-ad)} + \frac{2B^2(a+bx)}{i^2(c+dx)(bc-ad)}$$

[Out]  $(-2*A*B*(a + b*x))/((b*c - a*d)*i^{2*(c + d*x)}) + (2*B^2*(a + b*x))/((b*c - a*d)*i^{2*(c + d*x)}) - (2*B^2*(a + b*x)*\text{Log}[(e*(a + b*x))/(c + d*x)])/((b*c - a*d)*i^{2*(c + d*x)}) + ((a + b*x)*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)*i^{2*(c + d*x)})$

**Rubi [C]** time = 0.782059, antiderivative size = 472, normalized size of antiderivative = 3.11, number of steps used = 26, number of rules used = 11, integrand size = 32,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.344$ , Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 44}

$$\frac{2bB^2 \text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{di^2(bc-ad)} + \frac{2bB^2 \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{di^2(bc-ad)} + \frac{2bB \log(a+bx)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{di^2(bc-ad)} + \frac{2B\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{di^2(c+dx)}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])^2/(c*i + d*i*x)^2, x]$

[Out]  $(-2*B^2)/(d*i^{2*(c + d*x)}) - (2*b*B^2*\text{Log}[a + b*x])/(d*(b*c - a*d)*i^2) - (b*B^2*\text{Log}[a + b*x]^2)/(d*(b*c - a*d)*i^2) + (2*B*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(d*i^{2*(c + d*x)}) + (2*b*B*\text{Log}[a + b*x]*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(d*(b*c - a*d)*i^2) - (A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])^2/(d*i^{2*(c + d*x)}) + (2*b*B^2*\text{Log}[c + d*x])/(d*(b*c - a*d)*i^2) + (2*b*B^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))*\text{Log}[c + d*x])/(d*(b*c - a*d)*i^2) - (2*b*B*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])*\text{Log}[c + d*x])/(d*(b*c - a*d)*i^2) - (b*B^2*\text{Log}[c + d*x]^2)/(d*(b*c - a*d)*i^2) + (2*b*B^2*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)])/(d*(b*c - a*d)*i^2) + (2*b*B^2*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))])/(d*(b*c - a*d)*i^2) + (2*b*B^2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])/(d*(b*c - a*d)*i^2)$

**Rule 2525**

$\text{Int}[(a_. + \text{Log}[(c_.)*(RfX_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.), x\_Symbol] \rightarrow \text{Simp}[(d + e*x)^(m + 1)*(a + b*\text{Log}[c*RfX^p])^n/(e*(m + 1))$

```
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

### Rubi steps

$$\begin{aligned}
\int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(95c + 95dx)^2} dx &= -\frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9025d(c + dx)} + \frac{(2B) \int \frac{(bc-ad)\left(A+B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{95(a+bx)(c+dx)^2} dx}{95d} \\
&= -\frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9025d(c + dx)} + \frac{(2B(bc - ad)) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)(c+dx)^2} dx}{9025d} \\
&= -\frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9025d(c + dx)} + \frac{(2B(bc - ad)) \int \left(\frac{b^2\left(A+B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)^2(a+bx)} - \frac{d\left(A+B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)(c+dx)^2} - \frac{bd\left(A+B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)(c+dx)^2}\right) dx}{9025d} \\
&= -\frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9025d(c + dx)} - \frac{(2B) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(c+dx)^2} dx}{9025} - \frac{(2bB) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx} dx}{9025(bc - ad)} + \frac{(2b^2B) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(c+dx)^2} dx}{9025} \\
&= \frac{2B\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(c + dx)} + \frac{2bB \log(a + bx)\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(bc - ad)} - \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(c + dx)} \\
&= \frac{2B\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(c + dx)} + \frac{2bB \log(a + bx)\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(bc - ad)} - \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(c + dx)} \\
&= \frac{2B\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(c + dx)} + \frac{2bB \log(a + bx)\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(bc - ad)} - \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(c + dx)} \\
&= -\frac{2B^2}{9025d(c + dx)} - \frac{2bB^2 \log(a + bx)}{9025d(bc - ad)} + \frac{2B\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(c + dx)} + \frac{2bB \log(a + bx)\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(bc - ad)} \\
&= -\frac{2B^2}{9025d(c + dx)} - \frac{2bB^2 \log(a + bx)}{9025d(bc - ad)} + \frac{2B\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(c + dx)} + \frac{2bB \log(a + bx)\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(bc - ad)} \\
&= -\frac{2B^2}{9025d(c + dx)} - \frac{2bB^2 \log(a + bx)}{9025d(bc - ad)} - \frac{bB^2 \log^2(a + bx)}{9025d(bc - ad)} + \frac{2B\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(c + dx)} + \frac{2bB \log(a + bx)\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(bc - ad)} \\
&= -\frac{2B^2}{9025d(c + dx)} - \frac{2bB^2 \log(a + bx)}{9025d(bc - ad)} - \frac{bB^2 \log^2(a + bx)}{9025d(bc - ad)} + \frac{2B\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(c + dx)} + \frac{2bB \log(a + bx)\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9025d(bc - ad)}
\end{aligned}$$

**Mathematica [C]** time = 0.436611, size = 315, normalized size = 2.07

$$\frac{B\left(-bB(c+dx)\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+bB(c+dx)\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)+2(bc-ad)\log^2(a+bx)}{9025d^2(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x]))^2/(c*i + d*i*x)^2,x]
```

```
[Out] -(A + B*Log[(e*(a + b*x))/(c + d*x]))^2 + (B*(2*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x])) + 2*b*(c + d*x)*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x])) - 2*b*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x]))*Log[c + d*x] - 2*B*(b*c - a*d + b*(c + d*x)*Log[a + b*x] - b*(c + d*x)*Log[c + d*x]) - b*B*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*B*(c + d*x)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d)/(d*i^2*(c + d*x))
```

**Maple [B]** time = 0.052, size = 1236, normalized size = 8.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^2,x)
```

```
[Out] 1/d/(a*d-b*c)^2/i^2*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b^2*c-d/(a*d-b*c)^2/i^2*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)*a^2+2*d/(a*d-b*c)^2/i^2*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*a^2-2/(a*d-b*c)^2/i^2*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*a-1/d/(a*d-b*c)^2/i^2*A^2/(d*x+c)*b^2*c^2+2/(a*d-b*c)^2/i^2*A*B*b*a-2/d/(a*d-b*c)^2/i^2*A*B*b^2*c+2/d/(a*d-b*c)^2/i^2*A*B/(d*x+c)*b^2*c^2-4/(a*d-b*c)^2/i^2*A*B/(d*x+c)*a*b*c-1/d/(a*d-b*c)^2/i^2*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)*b^2*c^2+2/(a*d-b*c)^2/i^2*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*a*b*c+2/d/(a*d-b*c)^2/i^2*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*a^2+2/d/(a*d-b*c)^2/i^2*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*c-2*d/(a*d-b*c)^2/i^2*B^2/(d*x+c)*a^2+2/(a*d-b*c)^2/i^2*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*a-1/(a*d-b*c)^2/i^2*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b*a-d/(a*d-b*c)^2/i^2*A^2/(d*x+c)*a^2+2/d/(a*d-b*c)^2/i^2*B^2*b^2*c+1/d/(a*d-b*c)^2/i^2*A^2*b^2*c-1/(a*d-b*c)^2/i^2*A^2*b*a-2/(a*d-b*c)^2/i^2*B^2*b*a-2/d/(a*d-b*c)^2/i^2*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*b^2*c^2+4/(a*d-b*c)^2/i^2*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*a*b*c+2*d/(a*d-b*c)^2/i^2*A*B/(d*x+c)*a^2-2/d/(a*d-b*c)^2/i^2*B^2/(d*x+c)*b^2*c^2+4/(a*d-b*c)^2/i^2*B^2/(d*x+c)*a*b*c-2/d/(a*d-b*c)^2/i^2*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*c+2/(a*d-b*c)^2/i^2*A^2/(d*x+c)*a*b*c
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**Maxima [B]** time = 1.33913, size = 562, normalized size = 3.7

$$\left( 2 \left( \frac{1}{d^2 i^2 x + c d i^2} + \frac{b \log(bx + a)}{(bcd - ad^2) i^2} - \frac{b \log(dx + c)}{(bcd - ad^2) i^2} \right) \log \left( \frac{bex}{dx + c} + \frac{ae}{dx + c} \right) - \frac{(bdx + bc) \log(bx + a)^2 + (bdx + bc) \log(dx + c)}{(bcd - ad^2) i^2} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i)^2,x, algorithm="maxima")

[Out] (2\*(1/(d^2\*i^2\*x + c\*d\*i^2) + b\*log(b\*x + a)/((b\*c\*d - a\*d^2)\*i^2) - b\*log(d\*x + c)/((b\*c\*d - a\*d^2)\*i^2))\*log(b\*e\*x/(d\*x + c) + a\*e/(d\*x + c)) - ((b\*d\*x + b\*c)\*log(b\*x + a)^2 + (b\*d\*x + b\*c)\*log(d\*x + c)^2 + 2\*b\*c - 2\*a\*d + 2\*(b\*d\*x + b\*c)\*log(b\*x + a) - 2\*(b\*d\*x + b\*c + (b\*d\*x + b\*c)\*log(b\*x + a))\*log(d\*x + c))/(b\*c^2\*d\*i^2 - a\*c\*d^2\*i^2 + (b\*c\*d^2\*i^2 - a\*d^3\*i^2)\*x)\*B^2 - 2\*A\*B\*(log(b\*e\*x/(d\*x + c) + a\*e/(d\*x + c))/(d^2\*i^2\*x + c\*d\*i^2) - 1/(d^2\*i^2\*x + c\*d\*i^2) - b\*log(b\*x + a)/((b\*c\*d - a\*d^2)\*i^2) + b\*log(d\*x + c)/((b\*c\*d - a\*d^2)\*i^2)) - B^2\*log(b\*e\*x/(d\*x + c) + a\*e/(d\*x + c))^2/(d^2\*i^2\*x + c\*d\*i^2) - A^2/(d^2\*i^2\*x + c\*d\*i^2)

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**Fricas [A]** time = 0.512753, size = 319, normalized size = 2.1

$$\frac{(A^2 - 2AB + 2B^2)bc - (A^2 - 2AB + 2B^2)ad - (B^2bdx + B^2ad) \log\left(\frac{bex+ae}{dx+c}\right)^2 - 2((AB - B^2)bdx + (AB - B^2)ad) \log\left(\frac{bex+ae}{dx+c}\right)}{(bcd^2 - ad^3)i^2x + (bc^2d - acd^2)i^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i)^2,x, algorithm="fricas")

[Out] -((A^2 - 2\*A\*B + 2\*B^2)\*b\*c - (A^2 - 2\*A\*B + 2\*B^2)\*a\*d - (B^2\*b\*d\*x + B^2\*a\*d)\*log((b\*e\*x + a\*e)/(d\*x + c))^2 - 2\*((A\*B - B^2)\*b\*d\*x + (A\*B - B^2)\*a\*d)\*log((b\*e\*x + a\*e)/(d\*x + c)))/((b\*c\*d^2 - a\*d^3)\*i^2\*x + (b\*c^2\*d - a\*c\*d^2)\*i^2)

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**Sympy [B]** time = 3.85915, size = 432, normalized size = 2.84

$$\frac{2Bb(A-B) \log\left(x + \frac{2ABabd+2ABb^2c-2B^2abd-2B^2b^2c-\frac{2Ba^2bd^2(A-B)}{ad-bc} + \frac{4Bab^2cd(A-B)}{ad-bc} - \frac{2Bb^3c^2(A-B)}{ad-bc}}{4ABb^2d-4B^2b^2d}\right)}{di^2(ad-bc)} - \frac{2Bb(A-B) \log\left(x + \frac{2ABabd+2ABb^2c-2B^2abd-2B^2b^2c-\frac{2Ba^2bd^2(A-B)}{ad-bc} + \frac{4Bab^2cd(A-B)}{ad-bc} - \frac{2Bb^3c^2(A-B)}{ad-bc}}{4ABb^2d-4B^2b^2d}\right)}{di^2(ad-bc)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*(b\*x+a)/(d\*x+c)))\*\*2/(d\*i\*x+c\*i)\*\*2,x)

[Out] 2\*B\*b\*(A - B)\*log(x + (2\*A\*B\*a\*b\*d + 2\*A\*B\*b\*\*2\*c - 2\*B\*\*2\*a\*b\*d - 2\*B\*\*2\*b\*\*2\*c - 2\*B\*a\*\*2\*b\*d\*\*2\*(A - B)/(a\*d - b\*c) + 4\*B\*a\*b\*\*2\*c\*d\*(A - B)/(a\*d - b\*c) - 2\*B\*b\*\*3\*c\*\*2\*(A - B)/(a\*d - b\*c))/(4\*A\*B\*b\*\*2\*d - 4\*B\*\*2\*b\*\*2\*d))/ (d\*i\*\*2\*(a\*d - b\*c)) - 2\*B\*b\*(A - B)\*log(x + (2\*A\*B\*a\*b\*d + 2\*A\*B\*b\*\*2\*c - 2\*B\*\*2\*a\*b\*d - 2\*B\*\*2\*b\*\*2\*c + 2\*B\*a\*\*2\*b\*d\*\*2\*(A - B)/(a\*d - b\*c) - 4\*B\*a\*b\*\*2\*c\*d\*(A - B)/(a\*d - b\*c) + 2\*B\*b\*\*3\*c\*\*2\*(A - B)/(a\*d - b\*c))/(4\*A\*B\*b\*\*2\*d - 4\*B\*\*2\*b\*\*2\*d))/ (d\*i\*\*2\*(a\*d - b\*c)) + (-2\*A\*B + 2\*B\*\*2)\*log(e\*(a + b\*x)/(c + d\*x))/(c\*d\*i\*\*2 + d\*\*2\*i\*\*2\*x) + (-B\*\*2\*a - B\*\*2\*b\*x)\*log(e\*(a + b\*x)/(c + d\*x))\*\*2/(a\*c\*d\*i\*\*2 + a\*d\*\*2\*i\*\*2\*x - b\*c\*\*2\*i\*\*2 - b\*c\*d\*i\*\*2\*x) - (A\*\*2 - 2\*A\*B + 2\*B\*\*2)/(c\*d\*i\*\*2 + d\*\*2\*i\*\*2\*x)

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B \log\left(\frac{bx+ae}{dx+c}\right) + A\right)^2}{(dix + ci)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i)^2,x, algorithm="giac")

[Out] integrate((B\*log((b\*x + a)\*e/(d\*x + c)) + A)^2/(d\*i\*x + c\*i)^2, x)

$$3.96 \quad \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)(ci+dx)^2} dx$$

**Optimal.** Leaf size=214

$$\frac{b \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)^3}{3Bgi^2(bc-ad)^2} - \frac{d(a+bx) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)^2}{gi^2(c+dx)(bc-ad)^2} + \frac{2ABd(a+bx)}{gi^2(c+dx)(bc-ad)^2} + \frac{2B^2d(a+bx) \log\left(\frac{e(a+bx)}{c+dx}\right)}{gi^2(c+dx)(bc-ad)^2} - \frac{2B^2d(a+bx)}{gi^2(c+dx)(bc-ad)^2}$$

[Out]  $(2*A*B*d*(a + b*x))/((b*c - a*d)^2*g*i^2*(c + d*x)) - (2*B^2*d*(a + b*x))/((b*c - a*d)^2*g*i^2*(c + d*x)) + (2*B^2*d*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/((b*c - a*d)^2*g*i^2*(c + d*x)) - (d*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x]))^2)/((b*c - a*d)^2*g*i^2*(c + d*x)) + (b*(A + B*Log[(e*(a + b*x))/(c + d*x]))^3)/(3*B*(b*c - a*d)^2*g*i^2)$

**Rubi [C]** time = 6.4707, antiderivative size = 1687, normalized size of antiderivative = 7.88, number of steps used = 87, number of rules used = 31, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.738$ , Rules used = {2528, 2524, 12, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2525, 44, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))^2/((a\*g + b\*g\*x)\*(c\*i + d\*i\*x)^2), x]

[Out]  $(2*B^2)/((b*c - a*d)*g*i^2*(c + d*x)) + (2*b*B^2*Log[a + b*x])/((b*c - a*d)^2*g*i^2) - (A*b*B*Log[a + b*x]^2)/((b*c - a*d)^2*g*i^2) + (b*B^2*Log[a + b*x]^2)/((b*c - a*d)^2*g*i^2) + (b*B^2*Log[a + b*x]*Log[(c + d*x)^{-1}])^2/((b*c - a*d)^2*g*i^2) - (b*B^2*Log[-((d*(a + b*x))/(b*c - a*d))] * Log[(c + d*x)^{-1}])^2/((b*c - a*d)^2*g*i^2) - (b*B^2*Log[-((b*c - a*d)/(d*(a + b*x))]) * Log[(e*(a + b*x))/(c + d*x])^2)/((b*c - a*d)^2*g*i^2) - (b*B^2*Log[a + b*x] * Log[(e*(a + b*x))/(c + d*x])^2)/((b*c - a*d)^2*g*i^2) - (2*B*(A + B*Log[(e*(a + b*x))/(c + d*x])))/((b*c - a*d)*g*i^2*(c + d*x)) - (2*b*B*Log[a + b*x] * (A + B*Log[(e*(a + b*x))/(c + d*x])))/((b*c - a*d)^2*g*i^2) + (A + B*Log[(e*(a + b*x))/(c + d*x])^2)/((b*c - a*d)*g*i^2*(c + d*x)) + (b*Log[a + b*x] * (A + B*Log[(e*(a + b*x))/(c + d*x])^2)/((b*c - a*d)^2*g*i^2) - (2*b*B^2 * Log[c + d*x])/((b*c - a*d)^2*g*i^2) + (b*B^2*Log[a + b*x]^2*Log[c + d*x])/((b*c - a*d)^2*g*i^2) + (2*A*b*B*Log[-((d*(a + b*x))/(b*c - a*d))] * Log[c +$

$$\begin{aligned} & d*x])/((b*c - a*d)^2*g*i^2) - (2*b*B^2*Log[-((d*(a + b*x))/(b*c - a*d))] * Log \\ & g[c + d*x])/((b*c - a*d)^2*g*i^2) + (2*b*B^2*Log[a + b*x]*Log[(c + d*x)^{-1}] * Log[c + d*x])/((b*c - a*d)^2*g*i^2) - (2*b*B^2*Log[-((d*(a + b*x))/(b*c \\ & - a*d))] * (Log[a + b*x] + Log[(c + d*x)^{-1}] - Log[(e*(a + b*x))/(c + d*x]) * Log[c + d*x])/((b*c - a*d)^2*g*i^2) + (2*b*B*(A + B*Log[(e*(a + b*x))/(c \\ & + d*x])) * Log[c + d*x])/((b*c - a*d)^2*g*i^2) - (b*(A + B*Log[(e*(a + b*x))/( \\ & (c + d*x)])^2 * Log[c + d*x])/((b*c - a*d)^2*g*i^2) - (A*b*B*Log[c + d*x]^2)/ \\ & ((b*c - a*d)^2*g*i^2) + (b*B^2*Log[c + d*x]^2)/((b*c - a*d)^2*g*i^2) + (b*B \\ & ^2*Log[a + b*x]*Log[c + d*x]^2)/((b*c - a*d)^2*g*i^2) - (b*B^2*Log[(e*(a + \\ & b*x))/(c + d*x])*Log[c + d*x]^2)/((b*c - a*d)^2*g*i^2) - (b*B^2*Log[c + d*x \\ & ]^3)/(3*(b*c - a*d)^2*g*i^2) + (2*A*b*B*Log[a + b*x]*Log[(b*(c + d*x))/(b*c \\ & - a*d)])/((b*c - a*d)^2*g*i^2) - (2*b*B^2*Log[a + b*x]*Log[(b*(c + d*x))/( \\ & b*c - a*d)])/((b*c - a*d)^2*g*i^2) - (b*B^2*Log[a + b*x]^2 * Log[(b*(c + d*x) \\ & )/(b*c - a*d)])/((b*c - a*d)^2*g*i^2) + (2*A*b*B*PolyLog[2, -((d*(a + b*x)) \\ & / (b*c - a*d))]/((b*c - a*d)^2*g*i^2) - (2*b*B^2*PolyLog[2, -((d*(a + b*x)) \\ & / (b*c - a*d))]/((b*c - a*d)^2*g*i^2) - (2*b*B^2*Log[a + b*x]*PolyLog[2, -( \\ & (d*(a + b*x))/(b*c - a*d))]/((b*c - a*d)^2*g*i^2) + (2*A*b*B*PolyLog[2, (b \\ & *(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g*i^2) - (2*b*B^2*PolyLog[2, (b*(c \\ & + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g*i^2) + (2*b*B^2*Log[(c + d*x)^{-1}] \\ & *PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g*i^2) - (2*b*B^2*(L \\ & og[a + b*x] + Log[(c + d*x)^{-1}] - Log[(e*(a + b*x))/(c + d*x]) * PolyLog[2 \\ & , (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g*i^2) + (2*b*B^2*Log[(e*(a + \\ & b*x))/(c + d*x])*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))]/((b*c - a*d)^2* \\ & g*i^2) + (2*b*B^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))]/((b*c - a*d)^2* \\ & g*i^2) + (2*b*B^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g*i \\ & ^2) + (2*b*B^2*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))]/((b*c - a*d)^2*g* \\ & i^2) \end{aligned}$$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
```

$Q[u, (b_*)(v_*) /; \text{FreeQ}[b, x]]$

### Rule 2418

$\text{Int}[(a_*) + \text{Log}[(c_*)((d_*) + (e_*)(x_*)^{(n_*)})*(b_*)^{(p_*)}(\text{RFx}_*)], x_{\text{Symbol}}] \rightarrow \text{With}[\{u = \text{ExpandIntegrand}[(a + b*\text{Log}[c*(d + e*x)^n]^p, \text{RFx}, x]\}, \text{Int}[u, x] /; \text{SumQ}[u] /; \text{FreeQ}[\{a, b, c, d, e, n\}, x] \&\& \text{RationalFunctionQ}[\text{RFx}, x] \&\& \text{IntegerQ}[p]$

### Rule 2390

$\text{Int}[(a_*) + \text{Log}[(c_*)((d_*) + (e_*)(x_*)^{(n_*)})*(b_*)^{(p_*)}((f_*) + (g_*)(x_*)^{(q_*)})], x_{\text{Symbol}}] \rightarrow \text{Dist}[1/e, \text{Subst}[\text{Int}[(f*x)/d]^q*(a + b*\text{Log}[c*x^n]^p, x], x, d + e*x], x] /; \text{FreeQ}[\{a, b, c, d, e, f, g, n, p, q\}, x] \&\& \text{EqQ}[e*f - d*g, 0]$

### Rule 2301

$\text{Int}[(a_*) + \text{Log}[(c_*)(x_*)^{(n_*)}*(b_*)]/(x_*)], x_{\text{Symbol}}] \rightarrow \text{Simp}[(a + b*\text{Log}[c*x^n])^2/(2*b*n), x] /; \text{FreeQ}[\{a, b, c, n\}, x]$

### Rule 2394

$\text{Int}[(a_*) + \text{Log}[(c_*)((d_*) + (e_*)(x_*)^{(n_*)})*(b_*)]/((f_*) + (g_*)(x_*)], x_{\text{Symbol}}] \rightarrow \text{Simp}[(\text{Log}[(e*(f + g*x))/(e*f - d*g)]*(a + b*\text{Log}[c*(d + e*x)^n]))/g, x] - \text{Dist}[(b*e*n)/g, \text{Int}[\text{Log}[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; \text{FreeQ}[\{a, b, c, d, e, f, g, n\}, x] \&\& \text{NeQ}[e*f - d*g, 0]$

### Rule 2393

$\text{Int}[(a_*) + \text{Log}[(c_*)((d_*) + (e_*)(x_*)^{(n_*)})*(b_*)]/((f_*) + (g_*)(x_*)], x_{\text{Symbol}}] \rightarrow \text{Dist}[1/g, \text{Subst}[\text{Int}[(a + b*\text{Log}[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; \text{FreeQ}[\{a, b, c, d, e, f, g\}, x] \&\& \text{NeQ}[e*f - d*g, 0] \&\& \text{EqQ}[g + c*(e*f - d*g), 0]$

### Rule 2391

$\text{Int}[\text{Log}[(c_*)((d_*) + (e_*)(x_*)^{(n_*)})]/(x_*)], x_{\text{Symbol}}] \rightarrow -\text{Simp}[\text{PolyLog}[2, -(c*e*x^n)]/n, x] /; \text{FreeQ}[\{c, d, e, n\}, x] \&\& \text{EqQ}[c*d, 1]$

### Rule 6688

$\text{Int}[u, x_{\text{Symbol}}] \rightarrow \text{With}[\{v = \text{SimplifyIntegrand}[u, x]\}, \text{Int}[v, x] /; \text{SimplerIntegrandQ}[v, u, x]]$

Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_.)
*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] := Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
x_Symbol] := Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] := Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] := With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
h*x)^t]^u)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s + 1))/(p*r*(s + 1)*(b*c
- a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q]^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] := -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q]^r]^(s - 1))/(a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
```

d, e, f, g, h, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && EqQ[b\*g - a\*h, 0] && IGtQ[s, 0]

### Rule 2506

Int[Log[v\_]\*Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.)\*(u\_), x\_Symbol] := With[{g = Simplify[((v - 1)\*(c + d\*x))/(a + b\*x)], h = Simplify[u\*(a + b\*x)\*(c + d\*x)]}, -Simp[(h\*PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/(b\*c - a\*d), x] + Dist[h\*p\*r\*s, Int[(PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s - 1)/(a + b\*x)\*(c + d\*x), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]

### Rule 6610

Int[(u\_)\*PolyLog[n\_, v\_], x\_Symbol] := With[{w = DerivativeDivides[v, u\*v, x]}, Simp[w\*PolyLog[n + 1, v], x] /; !FalseQ[w]] /; FreeQ[n, x]

### Rule 2525

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*((d\_.) + (e\_.)\*(x\_))^(m\_.), x\_Symbol] := Simp[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^n)/(e\*(m + 1)), x] - Dist[(b\*n\*p)/(e\*(m + 1)), Int[SimplifyIntegrand[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^n - 1)\*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

### Rule 44

Int[((a\_) + (b\_.)\*(x\_))^(m\_.)\*((c\_.) + (d\_.)\*(x\_))^(n\_.), x\_Symbol] := Int[ExpandIntegrand[(a + b\*x)^m\*(c + d\*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b\*c - a\*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])

### Rule 2500

Int[(Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]\*((s\_.) + Log[(i\_.)\*((g\_.) + (h\_.)\*(x\_))^(n\_.)]\*(t\_.)))/((j\_.) + (k\_.)\*(x\_)), x\_Symbol] := Dist[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r] - Log[(a + b\*x)^(p\*r)] - Log[(c + d\*x)^(q\*r)], Int[(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x], x] + (Int[(Log[(a + b\*x)^(p\*r)]\*(s + t\*Log[i\*(g + h\*x)^n])]/(j + k\*x), x] + Int[(Log[(c + d\*x)^(q\*r)]\*(s + t\*Log[i\*(g + h\*x)^n])]/(j + k\*x), x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0]

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e]^m)], x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*1, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]^(r_.))*((a_.) + Log[(c_.)*(x_)^(n_
.))*((b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Symbol] :>
Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*1)/l) + (e*x)/l)^n]*(f +
g*Log[h*(-((j*k - i*1)/l) + (j*x)/l)^m)], x], x, k + l*x], x] /; FreeQ[{a,
b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n]*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n])]/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x]
*(f + g*Log[h*(i + j*x)^m])]/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
```



, g, h, i, j, m, n}, x] && EqQ[e\*i - d\*j, 0]

### Rule 2499

Int[(Log[(e\_.)\*((f\_.)\*(a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.) )^(r\_.)]\*((s\_.) + Log[(i\_.)\*((g\_.) + (h\_.)\*(x\_))^(n\_.)]\*(t\_.))^(m\_.))/((j\_. ) + (k\_.)\*(x\_)), x\_Symbol] := Simp[((s + t\*Log[i\*(g + h\*x)^n])^(m + 1)\*Log[ e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r)/(k\*n\*t\*(m + 1)), x] + (-Dist[(b\*p\*r)/(k\*n \*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(a + b\*x), x], x] - Dis t[(d\*q\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(c + d\*x) , x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0] && EqQ[h\*j - g\*k, 0] && IGtQ[m, 0]

### Rule 2396

Int[((a\_.) + Log[(c\_.)\*((d\_.) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)/((f\_.) + (g\_. )\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])^p)/g, x] - Dist[(b\*e\*n\*p)/g, Int[(Log[(e\*(f + g\*x))/(e\*f - d\*g)] \* (a + b\*Log[c\*(d + e\*x)^n])^(p - 1))/(d + e\*x), x], x] /; FreeQ[{a, b, c, d , e, f, g, n, p}, x] && NeQ[e\*f - d\*g, 0] && IGtQ[p, 1]

### Rule 2302

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/(x\_), x\_Symbol] := Dist[1/( b\*n), Subst[Int[x^p, x], x, a + b\*Log[c\*x^n]], x] /; FreeQ[{a, b, c, n, p}, x]

### Rule 30

Int[(x\_)^(m\_.), x\_Symbol] := Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && NeQ[m, -1]

### Rubi steps

$$\begin{aligned}
\int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(96c + 96dx)^2(ag + bgx)} dx &= \int \left( \frac{b^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc - ad)^2g(a + bx)} - \frac{d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc - ad)g(c + dx)^2} - \frac{bd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc - ad)^2g(c + dx)} \right) dx \\
&= \frac{b^2 \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx} dx}{9216(bc - ad)^2g} - \frac{(bd) \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx} dx}{9216(bc - ad)^2g} - \frac{d \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(c+dx)^2} dx}{9216(bc - ad)g} \\
&= \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc - ad)g(c + dx)} + \frac{b \log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc - ad)^2g} - \frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc - ad)g} \\
&= \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc - ad)g(c + dx)} + \frac{b \log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc - ad)^2g} - \frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc - ad)g} \\
&= \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc - ad)g(c + dx)} + \frac{b \log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc - ad)^2g} - \frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc - ad)g} \\
&= \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc - ad)g(c + dx)} + \frac{b \log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc - ad)^2g} - \frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9216(bc - ad)g} \\
&= -\frac{B \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4608(bc - ad)g(c + dx)} - \frac{bB \log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4608(bc - ad)^2g} + \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9216(bc - ad)g(c + dx)} \\
&= -\frac{B \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4608(bc - ad)g(c + dx)} - \frac{bB \log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4608(bc - ad)^2g} + \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9216(bc - ad)g(c + dx)} \\
&= -\frac{bB^2 \log(a + bx) \log^2\left(\frac{e(a+bx)}{c+dx}\right)}{9216(bc - ad)^2g} - \frac{B \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4608(bc - ad)g(c + dx)} - \frac{bB \log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4608(bc - ad)^2g} \\
&= \frac{B^2}{4608(bc - ad)g(c + dx)} + \frac{bB^2 \log(a + bx)}{4608(bc - ad)^2g} - \frac{bB^2 \log\left(-\frac{bc-ad}{d(a+bx)}\right) \log^2\left(\frac{e(a+bx)}{c+dx}\right)}{9216(bc - ad)^2g} - \frac{bB^2 \log\left(-\frac{bc-ad}{d(a+bx)}\right) \log\left(\frac{e(a+bx)}{c+dx}\right)}{9216(bc - ad)g} \\
&= \frac{B^2}{4608(bc - ad)g(c + dx)} + \frac{bB^2 \log(a + bx)}{4608(bc - ad)^2g} - \frac{AbB \log^2(a + bx)}{9216(bc - ad)^2g} - \frac{bB^2 \log\left(-\frac{bc-ad}{d(a+bx)}\right) \log\left(\frac{e(a+bx)}{c+dx}\right)}{9216(bc - ad)g} \\
&= \frac{B^2}{4608(bc - ad)g(c + dx)} + \frac{bB^2 \log(a + bx)}{4608(bc - ad)^2g} - \frac{AbB \log^2(a + bx)}{9216(bc - ad)^2g} + \frac{bB^2 \log^2(a + bx)}{9216(bc - ad)^2g} - \frac{bB^2 \log\left(-\frac{bc-ad}{d(a+bx)}\right) \log\left(\frac{e(a+bx)}{c+dx}\right)}{9216(bc - ad)g}
\end{aligned}$$

**Mathematica [A]** time = 0.709266, size = 187, normalized size = 0.87

$$\frac{3b(A^2 - 2AB + 2B^2)(c + dx)\log(a + bx) - 3(A^2 - 2AB + 2B^2)(ad + b(c + dx)\log(c + dx) - bc) + 3B(Ab(c + dx) - B^2c)}{3g^2(c + dx)(bc - ad)^2}$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))^2/((a\*g + b\*g\*x)\*(c\*i + d\*i\*x)^2), x]

[Out] (3\*b\*(A^2 - 2\*A\*B + 2\*B^2)\*(c + d\*x)\*Log[a + b\*x] + 6\*(A - B)\*B\*(b\*c - a\*d)\*Log[(e\*(a + b\*x))/(c + d\*x)] + 3\*B\*(-(B\*d\*(a + b\*x)) + A\*b\*(c + d\*x))\*Log[(e\*(a + b\*x))/(c + d\*x)]^2 + b\*B^2\*(c + d\*x)\*Log[(e\*(a + b\*x))/(c + d\*x)]^3 - 3\*(A^2 - 2\*A\*B + 2\*B^2)\*(-(b\*c) + a\*d + b\*(c + d\*x)\*Log[c + d\*x]))/(3\*(b\*c - a\*d)^2\*g\*i^2\*(c + d\*x))

**Maple [B]** time = 0.059, size = 1633, normalized size = 7.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)/(d\*i\*x+c\*i)^2, x)

[Out] d/i^2/(a\*d-b\*c)^3/g\*A\*B\*b\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))^2\*a-2/i^2/(a\*d-b\*c)^3/g\*A\*B\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))/(d\*x+c)\*b^2\*c^2-4\*d/i^2/(a\*d-b\*c)^3/g\*B^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))/(d\*x+c)\*a\*b\*c+2\*d/i^2/(a\*d-b\*c)^3/g\*B^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))^2/(d\*x+c)\*a\*b\*c-4\*d/i^2/(a\*d-b\*c)^3/g\*A\*B/(d\*x+c)\*a\*b\*c-1/3/i^2/(a\*d-b\*c)^3/g\*B^2\*b^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))^3\*c-1/i^2/(a\*d-b\*c)^3/g\*A^2\*b^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))\*c-2\*d^2/i^2/(a\*d-b\*c)^3/g\*B^2/(d\*x+c)\*a^2-2/i^2/(a\*d-b\*c)^3/g\*B^2/(d\*x+c)\*b^2\*c^2-d^2/i^2/(a\*d-b\*c)^3/g\*A^2/(d\*x+c)\*a^2-1/i^2/(a\*d-b\*c)^3/g\*A^2/(d\*x+c)\*b^2\*c^2+1/i^2/(a\*d-b\*c)^3/g\*B^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))^2\*b^2\*c-2/i^2/(a\*d-b\*c)^3/g\*B^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))\*b^2\*c+2\*d^2/i^2/(a\*d-b\*c)^3/g\*B^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))/(d\*x+c)\*a^2+2\*d^2/i^2/(a\*d-b\*c)^3/g\*A\*B/(d\*x+c)\*a^2-2\*d/i^2/(a\*d-b\*c)^3/g\*B^2\*b\*a+2/i^2/(a\*d-b\*c)^3/g\*B^2\*b^2\*c+d/i^2/(a\*d-b\*c)^3/g\*A^2\*b\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))\*a-d^2/i^2/(a\*d-b\*c)^3/g\*B^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))^2/(d\*x+c)\*a^2+1/3\*d/i^2/(a\*d-b\*c)^3/g\*B^2\*b\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))^3\*a+2\*d/i^2/(a\*d-b\*c)^3/g\*B^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))\*b\*a+2/i^2/(a\*d-b\*c)^3/g\*A\*B\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))\*b^2\*c-1/i^2/(a\*d-b\*c)^3/g\*A\*B\*b^2\*ln(b\*e/d+(a\*d-b\*c)\*e/

$$\frac{d/(d*x+c))^{2*c-1}/i^{2/(a*d-b*c)^3/g*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^{2/(d*x+c)*b^2*c^2+2}/i^{2/(a*d-b*c)^3/g*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)))/(d*x+c)*b^2*c^2+2/i^{2/(a*d-b*c)^3/g*A*B/(d*x+c)*b^2*c^2-d}/i^{2/(a*d-b*c)^3/g*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^{2*b*a+4*d}/i^{2/(a*d-b*c)^3/g*A*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)))/(d*x+c)*a*b*c+4*d}/i^{2/(a*d-b*c)^3/g*B^2/(d*x+c)*a*b*c+2*d}/i^{2/(a*d-b*c)^3/g*A^2/(d*x+c)*a*b*c-d}/i^{2/(a*d-b*c)^3/g*A^2*b*a+1}/i^{2/(a*d-b*c)^3/g*A^2*b^2*c-2*d}/i^{2/(a*d-b*c)^3/g*A*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)))*b*a-2*d^2}/i^{2/(a*d-b*c)^3/g*A*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)))/(d*x+c)*a^2+2*d}/i^{2/(a*d-b*c)^3/g*A*B*b*a-2}/i^{2/(a*d-b*c)^3/g*A*B*b^2*c}$$

**Maxima [B]** time = 1.57156, size = 1355, normalized size = 6.33

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)/(d*i*x+c*i)^2,x, algorithm="maxima")
```

```
[Out] B^2*(1/((b*c*d - a*d^2)*g*i^2*x + (b*c^2 - a*c*d)*g*i^2) + b*log(b*x + a)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g*i^2) - b*log(d*x + c)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g*i^2))*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2 + 2*A*B*(1/((b*c*d - a*d^2)*g*i^2*x + (b*c^2 - a*c*d)*g*i^2) + b*log(b*x + a)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g*i^2))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 1/3*B^2*(3*((b*d*x + b*c)*log(b*x + a)^2 + (b*d*x + b*c)*log(d*x + c)^2 + 2*b*c - 2*a*d + 2*(b*d*x + b*c)*log(b*x + a) - 2*(b*d*x + b*c + (b*d*x + b*c)*log(b*x + a))*log(d*x + c))*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^2*c^3*g*i^2 - 2*a*b*c^2*d*g*i^2 + a^2*c*d^2*g*i^2 + (b^2*c^2*d*g*i^2 - 2*a*b*c*d^2*g*i^2 + a^2*d^3*g*i^2)*x) - ((b*d*x + b*c)*log(b*x + a)^3 - (b*d*x + b*c)*log(d*x + c)^3 + 3*(b*d*x + b*c)*log(b*x + a)^2 + 3*(b*d*x + b*c + (b*d*x + b*c)*log(b*x + a))*log(d*x + c)^2 + 6*b*c - 6*a*d + 6*(b*d*x + b*c)*log(b*x + a) - 3*(2*b*d*x + (b*d*x + b*c)*log(b*x + a)^2 + 2*b*c + 2*(b*d*x + b*c)*log(b*x + a))*log(d*x + c))/(b^2*c^3*g*i^2 - 2*a*b*c^2*d*g*i^2 + a^2*c*d^2*g*i^2 + (b^2*c^2*d*g*i^2 - 2*a*b*c*d^2*g*i^2 + a^2*d^3*g*i^2)*x)) + A^2*(1/((b*c*d - a*d^2)*g*i^2*x + (b*c^2 - a*c*d)*g*i^2) + b*log(b*x + a)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g*i^2) - b*log(d*x + c)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g*i^2)) - ((b*d*x + b*c)*log(b*x + a)^2 + (b*d*x + b*c)*log(d*x + c)^2 + 2*b*c - 2*a*d + 2*(b*d*x + b*c)*log(b*x + a) - 2*(b*d*x + b*c + (b*d*x + b*c)*log(b*x + a))*log(d*x + c))*A*B/(b^2*c^3*g*i^2 - 2*a*b*c^2*d*g*i^2 + a^2*c*d^2*g*i^2 + (b^2*c^2*d*g*i^2 - 2*a*b*c*d^2*g*i^2 + a^2*d^3*g*i^2)*x)
```

**Fricas [A]** time = 0.521285, size = 510, normalized size = 2.38

$$\frac{(B^2 b d x + B^2 b c) \log\left(\frac{b e x + a e}{d x + c}\right)^3 + 3(A^2 - 2 A B + 2 B^2) b c - 3(A^2 - 2 A B + 2 B^2) a d + 3(ABbc - B^2 ad + (AB - B^2) b d x)}{3((b^2 c^2 d - 2 a b c d^2 + a^2 d^3) g i^2 x + (b^2 c^3 - 2 a b c^2 d +$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)/(d\*i\*x+c\*i)^2,x, algorithm="fricas")

[Out] 1/3\*((B^2\*b\*d\*x + B^2\*b\*c)\*log((b\*e\*x + a\*e)/(d\*x + c))^3 + 3\*(A^2 - 2\*A\*B + 2\*B^2)\*b\*c - 3\*(A^2 - 2\*A\*B + 2\*B^2)\*a\*d + 3\*(A\*B\*b\*c - B^2\*a\*d + (A\*B - B^2)\*b\*d\*x)\*log((b\*e\*x + a\*e)/(d\*x + c))^2 + 3\*(A^2\*b\*c + (A^2 - 2\*A\*B + 2\*B^2)\*b\*d\*x - 2\*(A\*B - B^2)\*a\*d)\*log((b\*e\*x + a\*e)/(d\*x + c)))/((b^2\*c^2\*d - 2\*a\*b\*c\*d^2 + a^2\*d^3)\*g\*i^2\*x + (b^2\*c^3 - 2\*a\*b\*c^2\*d + a^2\*c\*d^2)\*g\*i^2)

**Sympy [B]** time = 4.92577, size = 539, normalized size = 2.52

$$\frac{B^2 b \log\left(\frac{e(a+bx)}{c+dx}\right)^3}{3a^2 d^2 g i^2 - 6abcd g i^2 + 3b^2 c^2 g i^2} + \frac{(-2AB + 2B^2) \log\left(\frac{e(a+bx)}{c+dx}\right)}{acd g i^2 + ad^2 g i^2 x - bc^2 g i^2 - bcd g i^2 x} + (A^2 - 2AB + 2B^2) \left( \frac{b \log\left(x + \frac{-\frac{a^3 b d^3}{(ad-bc)^2} + \frac{3a^2 b^2 c}{(ad-bc)}}{g i^2 (a d - b c)} \right)}{g i^2 (a d - b c)} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*(b\*x+a)/(d\*x+c)))\*\*2/(b\*g\*x+a\*g)/(d\*i\*x+c\*i)\*\*2,x)

[Out] B\*\*2\*b\*log(e\*(a + b\*x)/(c + d\*x))\*\*3/(3\*a\*\*2\*d\*\*2\*g\*i\*\*2 - 6\*a\*b\*c\*d\*g\*i\*\*2 + 3\*b\*\*2\*c\*\*2\*g\*i\*\*2) + (-2\*A\*B + 2\*B\*\*2)\*log(e\*(a + b\*x)/(c + d\*x))/(a\*c\*d\*g\*i\*\*2 + a\*d\*\*2\*g\*i\*\*2\*x - b\*c\*\*2\*g\*i\*\*2 - b\*c\*d\*g\*i\*\*2\*x) + (A\*\*2 - 2\*A\*B + 2\*B\*\*2)\*(-b\*log(x + (-a\*\*3\*b\*d\*\*3/(a\*d - b\*c)\*\*2 + 3\*a\*\*2\*b\*\*2\*c\*d\*\*2/(a\*d - b\*c)\*\*2 - 3\*a\*b\*\*3\*c\*\*2\*d/(a\*d - b\*c)\*\*2 + a\*b\*d + b\*\*4\*c\*\*3/(a\*d - b\*c)\*\*2 + b\*\*2\*c)/(2\*b\*\*2\*d))/(g\*i\*\*2\*(a\*d - b\*c)\*\*2) + b\*log(x + (a\*\*3\*b\*d\*\*3/(a\*d - b\*c)\*\*2 - 3\*a\*\*2\*b\*\*2\*c\*d\*\*2/(a\*d - b\*c)\*\*2 + 3\*a\*b\*\*3\*c\*\*2\*d/(a\*d - b\*c)\*\*2 + a\*b\*d - b\*\*4\*c\*\*3/(a\*d - b\*c)\*\*2 + b\*\*2\*c)/(2\*b\*\*2\*d))/(g\*i\*\*2\*(a\*d - b\*c)\*\*2) - 1/(a\*c\*d\*g\*i\*\*2 - b\*c\*\*2\*g\*i\*\*2 + x\*(a\*d\*\*2\*g\*i\*\*2 - b

$c*d*g^{i^2})) + (A*B*b*c + A*B*b*d*x - B^2*a*d - B^2*b*d*x)*\log(e*(a + b*x)/(c + d*x))^{i^2}/(a^2*c*d^{i^2} + a^2*d^{i^2}g^{i^2}x - 2*a*b*c^{i^2}d*g^{i^2}x - 2*a*b*c*d^{i^2}g^{i^2}x + b^2*c^{i^2}g^{i^2}x + b^2*c^{i^2}d*g^{i^2}x)$

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B \log\left(\frac{bx+ae}{dx+c}\right) + A\right)^2}{(bgx+ag)(dix+ci)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)/(d\*i\*x+c\*i)^2,x, algorithm="giac")

[Out] integrate((B\*log((b\*x + a)\*e/(d\*x + c)) + A)^2/((b\*g\*x + a\*g)\*(d\*i\*x + c\*i)^2), x)

$$3.97 \quad \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^2(ci+dix)^2} dx$$

**Optimal.** Leaf size=365

$$\frac{b^2(c+dx)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)^2}{g^2i^2(a+bx)(bc-ad)^3} - \frac{2b^2B(c+dx)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{g^2i^2(a+bx)(bc-ad)^3} + \frac{d^2(a+bx)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)^2}{g^2i^2(c+dx)(bc-ad)^3} - \frac{2ABc}{g^2i^2(c+dx)}$$

[Out]  $(-2*A*B*d^2*(a + b*x))/((b*c - a*d)^3*g^2*i^2*(c + d*x)) + (2*B^2*d^2*(a + b*x))/((b*c - a*d)^3*g^2*i^2*(c + d*x)) - (2*b^2*B^2*(c + d*x))/((b*c - a*d)^3*g^2*i^2*(a + b*x)) - (2*B^2*d^2*(a + b*x)*\text{Log}[(e*(a + b*x))/(c + d*x)]) / ((b*c - a*d)^3*g^2*i^2*(c + d*x)) - (2*b^2*B*(c + d*x)*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])) / ((b*c - a*d)^3*g^2*i^2*(a + b*x)) + (d^2*(a + b*x)*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x]))^2) / ((b*c - a*d)^3*g^2*i^2*(c + d*x)) - (b^2*(c + d*x)*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x]))^2) / ((b*c - a*d)^3*g^2*i^2*(a + b*x)) - (2*b*d*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x]))^3) / (3*B*(b*c - a*d)^3*g^2*i^2)$

**Rubi [C]** time = 7.17614, antiderivative size = 1521, normalized size of antiderivative = 4.17, number of steps used = 113, number of rules used = 31, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.738$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2/((a\*g + b\*g\*x)^2\*(c\*i + d\*i\*x)^2), x]

[Out]  $(-2*b*B^2)/((b*c - a*d)^2*g^2*i^2*(a + b*x)) - (2*B^2*d)/((b*c - a*d)^2*g^2*i^2*(c + d*x)) - (4*b*B^2*d*\text{Log}[a + b*x])/((b*c - a*d)^3*g^2*i^2) + (2*A*b*B*d*\text{Log}[a + b*x]^2)/((b*c - a*d)^3*g^2*i^2) - (2*b*B^2*d*\text{Log}[a + b*x]*\text{Log}[(c + d*x)^{-1}])^2 / ((b*c - a*d)^3*g^2*i^2) + (2*b*B^2*d*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[(c + d*x)^{-1}])^2 / ((b*c - a*d)^3*g^2*i^2) + (2*b*B^2*d*\text{Log}[-((b*c - a*d)/(d*(a + b*x))])* \text{Log}[(e*(a + b*x))/(c + d*x])^2) / ((b*c - a*d)^3*g^2*i^2) + (2*b*B^2*d*\text{Log}[a + b*x]*\text{Log}[(e*(a + b*x))/(c + d*x])^2) / ((b*c - a*d)^3*g^2*i^2) - (2*b*B*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])) / ((b*c - a*d)^2*g^2*i^2*(a + b*x)) + (2*B*d*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])) /$

$$\begin{aligned} & ((b*c - a*d)^2*g^2*i^2*(c + d*x)) - (b*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]) \\ & ^2)/((b*c - a*d)^2*g^2*i^2*(a + b*x)) - (d*(A + B*\text{Log}[(e*(a + b*x))/(c + d* \\ & x)])^2)/((b*c - a*d)^2*g^2*i^2*(c + d*x)) - (2*b*d*\text{Log}[a + b*x]*(A + B*\text{Log}[ \\ & (e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^3*g^2*i^2) + (4*b*B^2*d*\text{Log}[c + d \\ & *x])/((b*c - a*d)^3*g^2*i^2) - (2*b*B^2*d*\text{Log}[a + b*x]^2*\text{Log}[c + d*x])/((b* \\ & c - a*d)^3*g^2*i^2) - (4*A*b*B*d*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + \\ & d*x])/((b*c - a*d)^3*g^2*i^2) - (4*b*B^2*d*\text{Log}[a + b*x]*\text{Log}[(c + d*x)^{-1}] \\ & *\text{Log}[c + d*x])/((b*c - a*d)^3*g^2*i^2) + (4*b*B^2*d*\text{Log}[-((d*(a + b*x))/(b* \\ & c - a*d))]*(\text{Log}[a + b*x] + \text{Log}[(c + d*x)^{-1}] - \text{Log}[(e*(a + b*x))/(c + d*x) \\ & ])*\text{Log}[c + d*x])/((b*c - a*d)^3*g^2*i^2) + (2*b*d*(A + B*\text{Log}[(e*(a + b*x)) \\ & ]/(c + d*x))]^2*\text{Log}[c + d*x])/((b*c - a*d)^3*g^2*i^2) + (2*A*b*B*d*\text{Log}[c + d \\ & *x]^2)/((b*c - a*d)^3*g^2*i^2) - (2*b*B^2*d*\text{Log}[a + b*x]*\text{Log}[c + d*x]^2)/(( \\ & b*c - a*d)^3*g^2*i^2) + (2*b*B^2*d*\text{Log}[(e*(a + b*x))/(c + d*x)]*\text{Log}[c + d*x \\ & ]^2)/((b*c - a*d)^3*g^2*i^2) + (2*b*B^2*d*\text{Log}[c + d*x]^3)/(3*(b*c - a*d)^3* \\ & g^2*i^2) - (4*A*b*B*d*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)]/((b*c - \\ & a*d)^3*g^2*i^2) + (2*b*B^2*d*\text{Log}[a + b*x]^2*\text{Log}[(b*(c + d*x))/(b*c - a*d)] \\ & )/((b*c - a*d)^3*g^2*i^2) - (4*A*b*B*d*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d \\ & ))])/((b*c - a*d)^3*g^2*i^2) + (4*b*B^2*d*\text{Log}[a + b*x]*\text{PolyLog}[2, -((d*(a + \\ & b*x))/(b*c - a*d))])/((b*c - a*d)^3*g^2*i^2) - (4*A*b*B*d*\text{PolyLog}[2, (b*(c \\ & + d*x))/(b*c - a*d)]/((b*c - a*d)^3*g^2*i^2) - (4*b*B^2*d*\text{Log}[(c + d*x)^{-1}] \\ & *\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]/((b*c - a*d)^3*g^2*i^2) + (4*b* \\ & B^2*d*(\text{Log}[a + b*x] + \text{Log}[(c + d*x)^{-1}] - \text{Log}[(e*(a + b*x))/(c + d*x)])* \\ & \text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]/((b*c - a*d)^3*g^2*i^2) - (4*b*B^2*d* \\ & \text{Log}[(e*(a + b*x))/(c + d*x)]*\text{PolyLog}[2, 1 + (b*c - a*d)/(d*(a + b*x))])/((b \\ & *c - a*d)^3*g^2*i^2) - (4*b*B^2*d*\text{PolyLog}[3, -((d*(a + b*x))/(b*c - a*d))]) \\ & /((b*c - a*d)^3*g^2*i^2) - (4*b*B^2*d*\text{PolyLog}[3, (b*(c + d*x))/(b*c - a*d)] \\ & )/((b*c - a*d)^3*g^2*i^2) - (4*b*B^2*d*\text{PolyLog}[3, 1 + (b*c - a*d)/(d*(a + b \\ & *x))])/((b*c - a*d)^3*g^2*i^2) \end{aligned}$$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[ {u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x] }, Int[u, x] /; SumQ[u
] ] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*
(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```



Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

Rule 44

```
Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_) + Log[(c_)*(RFX_)^(p_)])*(b_)^(n_)/((d_) + (e_)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFX^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_))^(n_)])*(b_)^(p_)*(RFX_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFX, x]}, Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFX, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_))^(n_)])*(b_)^(p_)*((f_) + (g_)*(x_))^(q_), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_) + Log[(c_)*(x_)^n])*(b_)/(x_), x_Symbol] := Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_))^(n_)])*(b_)/((f_) + (g_)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))])*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_)^(q_.))*((h_.) + (i_.)*(x_)^(r_.)), x_Symbol] := Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] := Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] := Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```

Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] := With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
h*x)^t]^u)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s + 1))/(p*r*(s + 1)*(b*c
- a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q]^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
EqQ[p + q, 0] && NeQ[s, -1]

```

### Rule 2488

```

Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] := -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q]^r]^(s - 1))/(a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]

```

### Rule 2506

```

Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] := With[{g = Simplify[(v - 1)*(c + d
*x))/(a + b*x]}, h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s - 1))/(
(a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]

```

### Rule 6610

```

Int[(u_)*PolyLog[n_, v_], x_Symbol] := With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /; !FalseQ[w] /; FreeQ[n, x]

```

### Rule 2500

```

Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*(s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))/((j_.) + (k
_.)*(x_)), x_Symbol] := Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]

```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e]^m)], x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*1, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]^(r_.))*((a_.) + Log[(c_.)*(x_)^(n_
.))*((b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Symbol] :>
Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*1)/l) + (e*x)/l)^n]*(f +
g*Log[h*(-((j*k - i*1)/l) + (j*x)/l)^m)], x], x, k + l*x], x] /; FreeQ[{a,
b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n]*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n])]/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x]
*(f + g*Log[h*(i + j*x)^m])]/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
```

, g, h, i, j, m, n}, x] && EqQ[e\*i - d\*j, 0]

### Rule 2499

Int[(Log[(e\_.)\*((f\_.)\*(a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.) )^(r\_.)]\*((s\_.) + Log[(i\_.)\*(g\_.) + (h\_.)\*(x\_)]^(n\_.)]\*(t\_.))^(m\_.))/((j\_. ) + (k\_.)\*(x\_)), x\_Symbol] := Simp[((s + t\*Log[i\*(g + h\*x)^n])^(m + 1)\*Log[ e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r)/(k\*n\*t\*(m + 1)), x] + (-Dist[(b\*p\*r)/(k\*n \*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(a + b\*x), x], x] - Dis t[(d\*q\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(c + d\*x) , x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0] && EqQ[h\*j - g\*k, 0] && IGtQ[m, 0]

### Rule 2396

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_)/((f\_.) + (g\_. )\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])^p)/g, x] - Dist[(b\*e\*n\*p)/g, Int[(Log[(e\*(f + g\*x))/(e\*f - d\*g)] \* (a + b\*Log[c\*(d + e\*x)^n])^(p - 1))/(d + e\*x), x], x] /; FreeQ[{a, b, c, d , e, f, g, n, p}, x] && NeQ[e\*f - d\*g, 0] && IGtQ[p, 1]

### Rule 2302

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/(x\_), x\_Symbol] := Dist[1/( b\*n), Subst[Int[x^p, x], x, a + b\*Log[c\*x^n]], x] /; FreeQ[{a, b, c, n, p}, x]

### Rule 30

Int[(x\_)^(m\_.), x\_Symbol] := Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && NeQ[m, -1]

### Rubi steps

$$\begin{aligned}
\int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(97c + 97dx)^2(ag + bgx)^2} dx &= \int \left( \frac{b^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc - ad)^2 g^2 (a + bx)^2} - \frac{2b^2 d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc - ad)^3 g^2 (a + bx)} + \frac{d^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc - ad)^2 g^2 (c + dx)} \right) dx \\
&= -\frac{(2b^2 d) \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx} dx}{9409(bc - ad)^3 g^2} + \frac{(2bd^2) \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx} dx}{9409(bc - ad)^3 g^2} + \frac{b^2 \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^2} dx}{9409(bc - ad)^2 g^2} \\
&= -\frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc - ad)^2 g^2 (a + bx)} - \frac{d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc - ad)^2 g^2 (c + dx)} - \frac{2bd \log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc - ad)^3 g^2} \\
&= -\frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc - ad)^2 g^2 (a + bx)} - \frac{d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc - ad)^2 g^2 (c + dx)} - \frac{2bd \log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc - ad)^3 g^2} \\
&= -\frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc - ad)^2 g^2 (a + bx)} - \frac{d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc - ad)^2 g^2 (c + dx)} - \frac{2bd \log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc - ad)^3 g^2} \\
&= -\frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc - ad)^2 g^2 (a + bx)} - \frac{d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc - ad)^2 g^2 (c + dx)} - \frac{2bd \log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc - ad)^3 g^2} \\
&= -\frac{2bB \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9409(bc - ad)^2 g^2 (a + bx)} + \frac{2Bd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9409(bc - ad)^2 g^2 (c + dx)} - \frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc - ad)^2 g^2 (a + bx)} \\
&= -\frac{2bB \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9409(bc - ad)^2 g^2 (a + bx)} + \frac{2Bd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9409(bc - ad)^2 g^2 (c + dx)} - \frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9409(bc - ad)^2 g^2 (a + bx)} \\
&= \frac{2bB^2 d \log(a + bx) \log^2\left(\frac{e(a+bx)}{c+dx}\right)}{9409(bc - ad)^3 g^2} - \frac{2bB \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9409(bc - ad)^2 g^2 (a + bx)} + \frac{2Bd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9409(bc - ad)^2 g^2 (c + dx)} \\
&= -\frac{2bB^2}{9409(bc - ad)^2 g^2 (a + bx)} - \frac{2B^2 d}{9409(bc - ad)^2 g^2 (c + dx)} - \frac{4bB^2 d \log(a + bx)}{9409(bc - ad)^3 g^2} + \frac{2bB^2 d}{9409(bc - ad)^2 g^2} \\
&= -\frac{2bB^2}{9409(bc - ad)^2 g^2 (a + bx)} - \frac{2B^2 d}{9409(bc - ad)^2 g^2 (c + dx)} - \frac{4bB^2 d \log(a + bx)}{9409(bc - ad)^3 g^2} + \frac{2AbBc}{9409} \\
&= -\frac{2bB^2}{9409(bc - ad)^2 g^2 (a + bx)} - \frac{2B^2 d}{9409(bc - ad)^2 g^2 (c + dx)} - \frac{4bB^2 d \log(a + bx)}{9409(bc - ad)^3 g^2} + \frac{2AbBc}{9409}
\end{aligned}$$

**Mathematica [A]** time = 1.04172, size = 307, normalized size = 0.84

$$3B(-a^2Bd^2 + 2abd(A(c + dx) - Bdx) + b^2(2Adx(c + dx) + Bc(c + 2dx))) \log^2\left(\frac{e(a+bx)}{c+dx}\right) - 3d(A^2 - 2AB + 2B^2)(a + b$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2/((a\*g + b\*g\*x)^2\*(c\*i + d\*i\*x)^2), x]

[Out] 
$$-(-3*(A^2 - 2*A*B + 2*B^2)*d*(-(b*c) + a*d)*(a + b*x) + 3*b*(A^2 + 2*A*B + 2*B^2)*(b*c - a*d)*(c + d*x) + 6*b*(A^2 + 2*B^2)*d*(a + b*x)*(c + d*x)*\text{Log}[a + b*x] + 6*B*(b*c - a*d)*(A*b*c + b*B*c + a*A*d - a*B*d + 2*A*b*d*x)*\text{Log}[(e*(a + b*x))/(c + d*x)] + 3*B*(-(a^2*B*d^2) + 2*a*b*d*(-(B*d*x) + A*(c + d*x)) + b^2*(2*A*d*x*(c + d*x) + B*c*(c + 2*d*x)))*\text{Log}[(e*(a + b*x))/(c + d*x)]^2 + 2*b*B^2*d*(a + b*x)*(c + d*x)*\text{Log}[(e*(a + b*x))/(c + d*x)]^3 - 6*b*(A^2 + 2*B^2)*d*(a + b*x)*(c + d*x)*\text{Log}[c + d*x])/(3*(b*c - a*d)^3*g^2*i^2*(a + b*x)*(c + d*x))$$

**Maple [B]** time = 0.053, size = 2572, normalized size = 7.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^2/(d\*i\*x+c\*i)^2,x)

[Out] 
$$\begin{aligned} & -2*d^3/i^2/(a*d-b*c)^4/g^2*B^2/(d*x+c)*a^2-d^3/i^2/(a*d-b*c)^4/g^2*A^2/(d*x+c)*a^2+e*d/i^2/(a*d-b*c)^4/g^2*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c) \\ & *ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+2*e*d/i^2/(a*d-b*c)^4/g^2*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c) \\ & *ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-4*d^2/i^2/(a*d-b*c)^4/g^2*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*b*c*a-2*e/i^2/(a*d-b*c)^4/g^2*A*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c) \\ & *ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+2*d^2/i^2/(a*d-b*c)^4/g^2*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)*b*c*a-2*d/i^2/(a*d-b*c)^4/g^2*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*b^2*c^2+2*e*d/i^2/(a*d-b*c)^4/g^2*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c) \\ & *a-4*d^2/i^2/(a*d-b*c)^4/g^2*A*B/(d*x+c)*a*b*c+2*d/i^2/(a*d-b*c)^4/g^2*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*b^2*c^2-2*d/i^2/(a*d-b*c)^4/g^2*A*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c+2*d/i^2/(a*d-b*c)^4/g^2*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*c-2*d^2/i^2/(a*d-b*c)^4/g^2*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*a-2*e/i^2/(a*d-b*c)^4/g^2*B^2*b^3/(b$$

$$\begin{aligned} & e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-2*d^3/i^2/ \\ & (a*d-b*c)^4/g^2*A*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*a^2+2*d/i^2/( \\ & a*d-b*c)^4/g^2*A*B/(d*x+c)*b^2*c^2+2*d^2/i^2/(a*d-b*c)^4/g^2*A^2/(d*x+c)*a* \\ & b*c-2*e/i^2/(a*d-b*c)^4/g^2*A*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c+4 \\ & *d^2/i^2/(a*d-b*c)^4/g^2*B^2/(d*x+c)*a*b*c+2*e*d/i^2/(a*d-b*c)^4/g^2*B^2*b^2/ \\ & (b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+e*d/i^2/(a*d-b*c)^4/g^2*A^2*b^2/(b* \\ & e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-e/i^2/(a*d-b*c)^4/g^2*B^2*b^3/(b*e/d+e/( \\ & d*x+c)*a-e/d/(d*x+c)*b*c)*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-d/i^2/(a*d-b* \\ & c)^4/g^2*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)*b^2*c^2+2*d^2/i^2/(a \\ & *d-b*c)^4/g^2*A*B*b*a-2*d/i^2/(a*d-b*c)^4/g^2*A*B*b^2*c-2*d^2/i^2/(a*d-b*c) \\ & ^4/g^2*B^2*b*a-d^2/i^2/(a*d-b*c)^4/g^2*A^2*b*a+d/i^2/(a*d-b*c)^4/g^2*A^2*b^ \\ & 2*c+d/i^2/(a*d-b*c)^4/g^2*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b^2*c-2*d/i \\ & ^2/(a*d-b*c)^4/g^2*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*c+2/3*d^2/i^2/(a \\ & *d-b*c)^4/g^2*B^2*b*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*a-2*d/i^2/(a*d-b*c)^4 \\ & /g^2*A^2*b^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+2*d^2/i^2/(a*d-b*c)^4/g^2*B^ \\ & 2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*a+2*d^2/i^2/(a*d-b*c)^4/g^2*A^2*b*\ln(b* \\ & e/d+(a*d-b*c)*e/d/(d*x+c))*a-2/3*d/i^2/(a*d-b*c)^4/g^2*B^2*b^2*\ln(b*e/d+(a \\ & d-b*c)*e/d/(d*x+c))^3*c-d^3/i^2/(a*d-b*c)^4/g^2*B^2*\ln(b*e/d+(a*d-b*c)*e/d/ \\ & (d*x+c))^2/(d*x+c)*a^2+2*d^3/i^2/(a*d-b*c)^4/g^2*B^2*\ln(b*e/d+(a*d-b*c)*e/d \\ & /d*x+c))^2*b*a-2*d/i^2/(a*d-b*c)^4/g^2*B^2/(d*x+c)*b^2*c^2-e/i^2/(a*d-b*c)^4/ \\ & g^2*A^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c-2*e/i^2/(a*d-b*c)^4/g^2*B \\ & ^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c-d/i^2/(a*d-b*c)^4/g^2*A^2/(d*x \\ & +c)*b^2*c^2+2*d^3/i^2/(a*d-b*c)^4/g^2*A*B/(d*x+c)*a^2+4*d^2/i^2/(a*d-b*c)^4 \\ & /g^2*A*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*b*c*a+2*e*d/i^2/(a*d-b*c)^ \\ & 4/g^2*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*\ln(b*e/d+(a*d-b*c)*e/d/(d \\ & *x+c))*a+2*d/i^2/(a*d-b*c)^4/g^2*B^2*b^2*c+2*d^2/i^2/(a*d-b*c)^4/g^2*A*B*b* \\ & \ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a \end{aligned}$$

**Maxima [B]** time = 1.92064, size = 2693, normalized size = 7.38

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^2/(d\*i\*x+c\*i)^2,x, algorithm="maxima")

[Out]  $-B^2*((2*b*d*x + b*c + a*d)/((b^3*c^2*d - 2*a*b^2*c*d^2 + a^2*b*d^3)*g^2*i^2*x^2 + (b^3*c^3 - a*b^2*c^2*d - a^2*b*c*d^2 + a^3*d^3)*g^2*i^2*x + (a*b^2*c^3 - 2*a^2*b*c^2*d + a^3*c*d^2)*g^2*i^2) + 2*b*d*\log(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2*i^2) - 2*b*d*\log(d*x + c)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2*i^2)$



$$\begin{aligned}
& 3c^3 - 3ab^2c^2d + 3a^2b^2cd^2 - a^3d^3)g^2i^2) \log(b^2e^x/(dx + c) + ae/(dx + c))^2 - 2AB((2b^2d^2x + b^2c + a^2d)/((b^3c^2d - 2ab^2c^2d^2 + a^2b^2d^3)g^2i^2x^2 + (b^3c^3 - ab^2c^2d - a^2b^2cd^2 + a^3d^3)g^2i^2x + (ab^2c^3 - 2a^2b^2c^2d + a^3cd^2)g^2i^2) + 2b^2d^2 \log(b^2e^x + a)/((b^3c^3 - 3ab^2c^2d + 3a^2b^2cd^2 - a^3d^3)g^2i^2) - 2b^2d^2 \log(dx + c)/((b^3c^3 - 3ab^2c^2d + 3a^2b^2cd^2 - a^3d^3)g^2i^2)) \log(b^2e^x/(dx + c) + ae/(dx + c)) - 2/3B^2(3(b^2c^2 - 2ab^2cd + a^2d^2 - (b^2d^2x^2 + ab^2cd + (b^2cd + ab^2d^2)x) \log(b^2e^x + a)^2 + 2(b^2d^2x^2 + ab^2cd + (b^2cd + ab^2d^2)x) \log(b^2e^x + a) \log(dx + c) - (b^2d^2x^2 + ab^2cd + (b^2cd + ab^2d^2)x) \log(dx + c)^2) \log(b^2e^x/(dx + c) + ae/(dx + c))/(ab^3c^4g^2i^2 - 3a^2b^2c^3d^2g^2i^2 + 3a^3b^2c^2d^2g^2i^2 - a^4cd^3g^2i^2 + (b^4c^3d^2g^2i^2 - 3ab^3c^2d^2g^2i^2 + 3a^2b^2c^2d^3g^2i^2 - a^3b^2d^4g^2i^2)x^2 + (b^4c^4g^2i^2 - 2ab^3c^3d^2g^2i^2 + 2a^3b^2cd^3g^2i^2 - a^4d^4g^2i^2)x) + (3b^2c^2 - 3a^2d^2 + (b^2d^2x^2 + ab^2cd + (b^2cd + ab^2d^2)x) \log(b^2e^x + a)^3 + 3(b^2d^2x^2 + ab^2cd + (b^2cd + ab^2d^2)x) \log(b^2e^x + a) \log(dx + c)^2 - (b^2d^2x^2 + ab^2cd + (b^2cd + ab^2d^2)x) \log(dx + c)^3 + 6(b^2cd - ab^2d^2)x + 6(b^2d^2x^2 + ab^2cd + (b^2cd + ab^2d^2)x) \log(b^2e^x + a) - 3(2b^2d^2x^2 + 2ab^2cd + (b^2d^2x^2 + ab^2cd + (b^2cd + ab^2d^2)x) \log(b^2e^x + a)^2 + 2(b^2cd + ab^2d^2)x) \log(dx + c))/(ab^3c^4g^2i^2 - 3a^2b^2c^3d^2g^2i^2 + 3a^3b^2c^2d^2g^2i^2 - a^4cd^3g^2i^2 + (b^4c^3d^2g^2i^2 - 3ab^3c^2d^2g^2i^2 + 3a^2b^2c^2d^3g^2i^2 - a^3b^2d^4g^2i^2)x^2 + (b^4c^4g^2i^2 - 2ab^3c^3d^2g^2i^2 + 2a^3b^2cd^3g^2i^2 - a^4d^4g^2i^2)x)) - A^2((2b^2d^2x + b^2c + a^2d)/((b^3c^2d - 2ab^2c^2d^2 + a^2b^2d^3)g^2i^2x^2 + (b^3c^3 - ab^2c^2d - a^2b^2cd^2 + a^3d^3)g^2i^2x + (ab^2c^3 - 2a^2b^2c^2d + a^3cd^2)g^2i^2) + 2b^2d^2 \log(b^2e^x + a)/((b^3c^3 - 3ab^2c^2d + 3a^2b^2cd^2 - a^3d^3)g^2i^2) - 2b^2d^2 \log(dx + c)/((b^3c^3 - 3ab^2c^2d + 3a^2b^2cd^2 - a^3d^3)g^2i^2)) - 2(b^2c^2 - 2ab^2cd + a^2d^2 - (b^2d^2x^2 + ab^2cd + (b^2cd + ab^2d^2)x) \log(b^2e^x + a)^2 + 2(b^2d^2x^2 + ab^2cd + (b^2cd + ab^2d^2)x) \log(b^2e^x + a) \log(dx + c) - (b^2d^2x^2 + ab^2cd + (b^2cd + ab^2d^2)x) \log(dx + c)^2)AB/(ab^3c^4g^2i^2 - 3a^2b^2c^3d^2g^2i^2 + 3a^3b^2c^2d^2g^2i^2 - a^4cd^3g^2i^2 + (b^4c^3d^2g^2i^2 - 3ab^3c^2d^2g^2i^2 + 3a^2b^2c^2d^3g^2i^2 - a^3b^2d^4g^2i^2)x^2 + (b^4c^4g^2i^2 - 2ab^3c^3d^2g^2i^2 + 2a^3b^2cd^3g^2i^2 - a^4d^4g^2i^2)x)
\end{aligned}$$

**Fricas [A]** time = 0.558737, size = 1062, normalized size = 2.91

$$12 ABabcd - 3(A^2 + 2AB + 2B^2)b^2c^2 + 3(A^2 - 2AB + 2B^2)a^2d^2 - 2(B^2b^2d^2x^2 + B^2abcd + (B^2b^2cd + B^2abd^2)x) \log$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x, alg
orithm="fricas")
```

```
[Out] 1/3*(12*A*B*a*b*c*d - 3*(A^2 + 2*A*B + 2*B^2)*b^2*c^2 + 3*(A^2 - 2*A*B + 2*
B^2)*a^2*d^2 - 2*(B^2*b^2*d^2*x^2 + B^2*a*b*c*d + (B^2*b^2*c*d + B^2*a*b*d^
2)*x)*log((b*e*x + a*e)/(d*x + c))^3 - 3*(2*A*B*b^2*d^2*x^2 + B^2*b^2*c^2 +
2*A*B*a*b*c*d - B^2*a^2*d^2 + 2*((A*B + B^2)*b^2*c*d + (A*B - B^2)*a*b*d^2
)*x)*log((b*e*x + a*e)/(d*x + c))^2 - 6*((A^2 + 2*B^2)*b^2*c*d - (A^2 + 2*B
^2)*a*b*d^2)*x - 6*((A^2 + 2*B^2)*b^2*d^2*x^2 + A^2*a*b*c*d + (A*B + B^2)*b
^2*c^2 - (A*B - B^2)*a^2*d^2 + ((A^2 + 2*A*B + 2*B^2)*b^2*c*d + (A^2 - 2*A*
B + 2*B^2)*a*b*d^2)*x)*log((b*e*x + a*e)/(d*x + c))/((b^4*c^3*d - 3*a*b^3*
c^2*d^2 + 3*a^2*b^2*c*d^3 - a^3*b*d^4)*g^2*i^2*x^2 + (b^4*c^4 - 2*a*b^3*c^3
*d + 2*a^3*b*c*d^3 - a^4*d^4)*g^2*i^2*x + (a*b^3*c^4 - 3*a^2*b^2*c^3*d + 3*
a^3*b*c^2*d^2 - a^4*c*d^3)*g^2*i^2)
```

---

**Sympy [B]** time = 11.0714, size = 1404, normalized size = 3.85

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**2/(d*i*x+c*i)**2,x)
```

```
[Out] 2*B**2*b*d*log(e*(a + b*x)/(c + d*x))**3/(3*a**3*d**3*g**2*i**2 - 9*a**2*b*
c*d**2*g**2*i**2 + 9*a*b**2*c**2*d*g**2*i**2 - 3*b**3*c**3*g**2*i**2) - 2*b
*d*(A**2 + 2*B**2)*log(x + (2*A**2*a*b*d**2 + 2*A**2*b**2*c*d + 4*B**2*a*b*
d**2 + 4*B**2*b**2*c*d - 2*a**4*b*d**5*(A**2 + 2*B**2))/(a*d - b*c)**3 + 8*a
**3*b**2*c*d**4*(A**2 + 2*B**2)/(a*d - b*c)**3 - 12*a**2*b**3*c**2*d**3*(A
*2 + 2*B**2)/(a*d - b*c)**3 + 8*a*b**4*c**3*d**2*(A**2 + 2*B**2)/(a*d - b*c
)**3 - 2*b**5*c**4*d*(A**2 + 2*B**2)/(a*d - b*c)**3)/(4*A**2*b**2*d**2 + 8*
B**2*b**2*d**2))/(g**2*i**2*(a*d - b*c)**3) + 2*b*d*(A**2 + 2*B**2)*log(x +
(2*A**2*a*b*d**2 + 2*A**2*b**2*c*d + 4*B**2*a*b*d**2 + 4*B**2*b**2*c*d + 2
*a**4*b*d**5*(A**2 + 2*B**2)/(a*d - b*c)**3 - 8*a**3*b**2*c*d**4*(A**2 + 2*
B**2)/(a*d - b*c)**3 + 12*a**2*b**3*c**2*d**3*(A**2 + 2*B**2)/(a*d - b*c)**
3 - 8*a*b**4*c**3*d**2*(A**2 + 2*B**2)/(a*d - b*c)**3 + 2*b**5*c**4*d*(A**2
+ 2*B**2)/(a*d - b*c)**3)/(4*A**2*b**2*d**2 + 8*B**2*b**2*d**2))/(g**2*i**
2*(a*d - b*c)**3) + (-2*A*B*a*d - 2*A*B*b*c - 4*A*B*b*d*x + 2*B**2*a*d - 2*
B**2*b*c)*log(e*(a + b*x)/(c + d*x))/(a**3*c*d**2*g**2*i**2 + a**3*d**3*g**
2*i**2*x - 2*a**2*b*c**2*d*g**2*i**2 - a**2*b*c*d**2*g**2*i**2*x + a**2*b*d
**3*g**2*i**2*x**2 + a*b**2*c**3*g**2*i**2 - a*b**2*c**2*d*g**2*i**2*x - 2*
```

```

a**2*c*d**2*g**2*i**2*x**2 + b**3*c**3*g**2*i**2*x + b**3*c**2*d*g**2*i**
2*x**2) + (2*A*B*a*b*c*d + 2*A*B*a*b*d**2*x + 2*A*B*b**2*c*d*x + 2*A*B*b**2
*d**2*x**2 - B**2*a**2*d**2 - 2*B**2*a*b*d**2*x + B**2*b**2*c**2 + 2*B**2*b
**2*c*d*x)*log(e*(a + b*x)/(c + d*x))**2/(a**4*c*d**3*g**2*i**2 + a**4*d**4
*g**2*i**2*x - 3*a**3*b*c**2*d**2*g**2*i**2 - 2*a**3*b*c*d**3*g**2*i**2*x +
a**3*b*d**4*g**2*i**2*x**2 + 3*a**2*b**2*c**3*d*g**2*i**2 - 3*a**2*b**2*c
d**3*g**2*i**2*x**2 - a*b**3*c**4*g**2*i**2 + 2*a*b**3*c**3*d*g**2*i**2*x +
3*a*b**3*c**2*d**2*g**2*i**2*x**2 - b**4*c**4*g**2*i**2*x - b**4*c**3*d*g
**2*i**2*x**2) - (A**2*a*d + A**2*b*c - 2*A*B*a*d + 2*A*B*b*c + 2*B**2*a*d +
2*B**2*b*c + x*(2*A**2*b*d + 4*B**2*b*d))/(a**3*c*d**2*g**2*i**2 - 2*a**2*
b*c**2*d*g**2*i**2 + a*b**2*c**3*g**2*i**2 + x**2*(a**2*b*d**3*g**2*i**2 -
2*a*b**2*c*d**2*g**2*i**2 + b**3*c**2*d*g**2*i**2) + x*(a**3*d**3*g**2*i**2
- a**2*b*c*d**2*g**2*i**2 - a*b**2*c**2*d*g**2*i**2 + b**3*c**3*g**2*i**2)
)

```

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B \log\left(\frac{bx+a}{dx+c}\right) + A\right)^2}{(bgx + ag)^2 (dix + ci)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^2/(d\*i\*x+c\*i)^2,x, algorithm="giac")

[Out] integrate((B\*log((b\*x + a)\*e/(d\*x + c)) + A)^2/((b\*g\*x + a\*g)^2\*(d\*i\*x + c\*i)^2), x)

$$3.98 \quad \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^3(ci+dix)^2} dx$$

**Optimal.** Leaf size=523

$$-\frac{b^3(c+dx)^2 \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)^2}{2g^3i^2(a+bx)^2(bc-ad)^4} - \frac{b^3B(c+dx)^2 \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{2g^3i^2(a+bx)^2(bc-ad)^4} + \frac{3b^2d(c+dx) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)^2}{g^3i^2(a+bx)(bc-ad)^4} + \frac{6b^2Bd}{g^3i^2(a+bx)(bc-ad)^4}$$

[Out]  $(2ABd^3(a+bx))/((b^3c-ad)^4g^3i^2(c+dx)) - (2B^2d^3(a+bx))/((b^3c-ad)^4g^3i^2(c+dx)) + (6b^2B^2d(c+dx))/((b^3c-ad)^4g^3i^2(a+bx)) - (b^3B^2(c+dx)^2)/(4(b^3c-ad)^4g^3i^2(a+bx)^2) + (2B^2d^3(a+bx)*\text{Log}[(e*(a+bx))/(c+dx)])/((b^3c-ad)^4g^3i^2(c+dx)) + (6b^2B^2d(c+dx)*(A+B*\text{Log}[(e*(a+bx))/(c+dx)]))/((b^3c-ad)^4g^3i^2(a+bx)) - (b^3B*(c+dx)^2*(A+B*\text{Log}[(e*(a+bx))/(c+dx)]))/(2*(b^3c-ad)^4g^3i^2(a+bx)^2) - (d^3*(a+bx)*(A+B*\text{Log}[(e*(a+bx))/(c+dx)]^2)/((b^3c-ad)^4g^3i^2(c+dx)) + (3b^2d(c+dx)*(A+B*\text{Log}[(e*(a+bx))/(c+dx)]^2)/((b^3c-ad)^4g^3i^2(a+bx)) - (b^3*(c+dx)^2*(A+B*\text{Log}[(e*(a+bx))/(c+dx)]^2)/(2*(b^3c-ad)^4g^3i^2(a+bx)^2) + (b*d^2*(A+B*\text{Log}[(e*(a+bx))/(c+dx)]^3)/(B*(b^3c-ad)^4g^3i^2)$

**Rubi [C]** time = 8.45885, antiderivative size = 2071, normalized size of antiderivative = 3.96, number of steps used = 143, number of rules used = 31, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.738$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2/((a\*g + b\*g\*x)^3\*(c\*i + d\*i\*x)^2), x]

[Out]  $-(bB^2)/(4(b^3c-ad)^2g^3i^2(a+bx)^2) + (11bB^2d)/(2(b^3c-ad)^3g^3i^2(a+bx)) + (2B^2d^2)/((b^3c-ad)^3g^3i^2(c+dx)) + (15bB^2d^2*\text{Log}[a+bx])/((b^3c-ad)^4g^3i^2) - (3AB^2d^2*\text{Log}[a+bx]^2)/((b^3c-ad)^4g^3i^2) - (3bB^2d^2*\text{Log}[a+bx]^2)/(2(b^3c-ad)^4g^3i^2) + (3bB^2d^2*\text{Log}[a+bx]*\text{Log}[(c+dx)^{-1}])^2/((b^3c-ad)^4g^3i^2) - (3bB^2d^2*\text{Log}[-((d*(a+bx))/(b^3c-ad))]*\text{Log}[(c+dx)$

$$\begin{aligned}
& )^{(-1)}]^2)/((b*c - a*d)^4*g^3*i^2) - (3*b*B^2*d^2*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^4*g^3*i^2) - (3*b*B^2*d^2*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^4*g^3*i^2) - (b*B*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^2*g^3*i^2*(a + b*x)^2) + (5*b*B*d*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b*c - a*d)^3*g^3*i^2*(a + b*x) - (2*B*d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b*c - a*d)^3*g^3*i^2*(c + d*x) + (3*b*B*d^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b*c - a*d)^4*g^3*i^2) - (b*(A + B*Log[(e*(a + b*x))/(c + d*x)]))^2)/(2*(b*c - a*d)^2*g^3*i^2*(a + b*x)^2) + (2*b*d*(A + B*Log[(e*(a + b*x))/(c + d*x)]))^2)/((b*c - a*d)^3*g^3*i^2*(a + b*x) + (d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))^2)/((b*c - a*d)^3*g^3*i^2*(c + d*x) + (3*b*d^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))^2)/((b*c - a*d)^4*g^3*i^2) - (15*b*B^2*d^2*Log[c + d*x])/(2*(b*c - a*d)^4*g^3*i^2) + (3*b*B^2*d^2*Log[a + b*x]^2*Log[c + d*x])/(b*c - a*d)^4*g^3*i^2) + (6*A*b*B*d^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b*c - a*d)^4*g^3*i^2) + (3*b*B^2*d^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b*c - a*d)^4*g^3*i^2) + (6*b*B^2*d^2*Log[a + b*x]*Log[(c + d*x)^(-1)]*Log[c + d*x])/(b*c - a*d)^4*g^3*i^2) - (6*b*B^2*d^2*Log[-((d*(a + b*x))/(b*c - a*d))]*(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x])/(b*c - a*d)^4*g^3*i^2) - (3*b*B*d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x])/(b*c - a*d)^4*g^3*i^2) - (3*b*d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))^2*Log[c + d*x])/(b*c - a*d)^4*g^3*i^2) - (3*A*b*B*d^2*Log[c + d*x]^2)/((b*c - a*d)^4*g^3*i^2) - (3*b*B^2*d^2*Log[c + d*x]^2)/(2*(b*c - a*d)^4*g^3*i^2) + (3*b*B^2*d^2*Log[a + b*x]*Log[c + d*x]^2)/((b*c - a*d)^4*g^3*i^2) - (3*b*B^2*d^2*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x]^2)/((b*c - a*d)^4*g^3*i^2) - (b*B^2*d^2*Log[c + d*x]^3)/((b*c - a*d)^4*g^3*i^2) + (6*A*b*B*d^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)]/(b*c - a*d)^4*g^3*i^2) + (3*b*B^2*d^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)]/(b*c - a*d)^4*g^3*i^2) - (3*b*B^2*d^2*Log[a + b*x]^2*Log[(b*(c + d*x))/(b*c - a*d)]/(b*c - a*d)^4*g^3*i^2) + (6*A*b*B*d^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))]/((b*c - a*d)^4*g^3*i^2) + (3*b*B^2*d^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))]/((b*c - a*d)^4*g^3*i^2) - (6*b*B^2*d^2*Log[a + b*x]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))]/((b*c - a*d)^4*g^3*i^2) + (6*A*b*B*d^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]/(b*c - a*d)^4*g^3*i^2) + (3*b*B^2*d^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]/(b*c - a*d)^4*g^3*i^2) + (6*b*B^2*d^2*Log[(c + d*x)^(-1)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]/(b*c - a*d)^4*g^3*i^2) - (6*b*B^2*d^2*(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]/(b*c - a*d)^4*g^3*i^2) + (6*b*B^2*d^2*Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))]/((b*c - a*d)^4*g^3*i^2) + (6*b*B^2*d^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))]/((b*c - a*d)^4*g^3*i^2) + (6*b*B^2*d^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)]/(b*c - a*d)^4*g^3*i^2) + (6*b*B^2*d^2*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))]/((b*c - a*d)^4*g^3*i^2)
\end{aligned}$$

Rule 2528

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(Rfx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, Rfx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
Rfx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
```

$(x)^{(q)}$ , x\_Symbol] := Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_) + Log[(c\_)\*(x\_)^(n\_)])\*(b\_)/(x\_), x\_Symbol] := Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rule 2394

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_)^(n\_))])\*(b\_)/((f\_) + (g\_)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_))])\*(b\_)/((f\_) + (g\_)\*(x\_)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_)\*((d\_) + (e\_)\*(x\_)^(n\_))]/(x\_), x\_Symbol] := -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rule 6688

Int[u\_, x\_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifyIntegrandQ[v, u, x]]

### Rule 6742

Int[u\_, x\_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]

### Rule 2411

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_)^(n\_))])\*(b\_)^(p\_)\*((f\_) + (g\_)\*(x\_)^(q\_))\*((h\_) + (i\_)\*(x\_)^(r\_)), x\_Symbol] := Dist[1/e, Subst[Int[((g\*x)/e)^q\*(e\*h - d\*i)/e + (i\*x)/e]^r\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e\*f - d

\*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2\*r]

### Rule 2344

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/((x\_)\*((d\_) + (e\_.)\*(x\_))),  
x\_Symbol] := Dist[1/d, Int[(a + b\*Log[c\*x^n])^p/x, x], x] - Dist[e/d, Int[  
(a + b\*Log[c\*x^n])^p/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I  
GtQ[p, 0]

### Rule 2317

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/((d\_) + (e\_.)\*(x\_)), x\_Symb  
ol] := Simp[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^p)/e, x] - Dist[(b\*n\*p)/e,  
Int[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b  
, c, d, e, n}, x] && IGtQ[p, 0]

### Rule 2507

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))  
^(r\_.)]^(s\_.)\*Log[(i\_.)\*((j\_.)\*((g\_.) + (h\_.)\*(x\_))^(t\_.))^(u\_.)]\*(v\_), x\_S  
ymbol] := With[{k = Simplify[v\*(a + b\*x)\*(c + d\*x)]}, Simp[(k\*Log[i\*(j\*(g +  
h\*x)^t]^u)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s + 1))/(p\*r\*(s + 1)\*(b\*c  
- a\*d)), x] - Dist[(k\*h\*t\*u)/(p\*r\*(s + 1)\*(b\*c - a\*d)), Int[Log[e\*(f\*(a +  
b\*x)^p\*(c + d\*x)^q]^r]^(s + 1)/(g + h\*x), x], x] /; FreeQ[k, x] /; FreeQ[{  
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b\*c - a\*d, 0] &&  
EqQ[p + q, 0] && NeQ[s, -1]

### Rule 2488

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))  
^(r\_.)]^(s\_.)/((g\_.) + (h\_.)\*(x\_)), x\_Symbol] := -Simp[(Log[-((b\*c - a\*d)/(  
d\*(a + b\*x)))]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/h, x] + Dist[(p\*r\*s\*  
(b\*c - a\*d))/h, Int[(Log[-((b\*c - a\*d)/(d\*(a + b\*x)))]\*Log[e\*(f\*(a + b\*x)^p  
\*(c + d\*x)^q]^r]^(s - 1))/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{a, b, c,  
d, e, f, g, h, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && EqQ  
[b\*g - a\*h, 0] && IGtQ[s, 0]

### Rule 2506

Int[Log[v\_]\*Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))  
^(q\_.)]^(r\_.)]^(s\_.)\*(u\_), x\_Symbol] := With[{g = Simplify[((v - 1)\*(c + d  
\*x))/(a + b\*x)], h = Simplify[u\*(a + b\*x)\*(c + d\*x)]}, -Simp[(h\*PolyLog[2,  
1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/(b\*c - a\*d), x] + Dist[h\*p\*r  
\*s, Int[(PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1))/((  
a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f



, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]

### Rule 6610

Int[(u\_)\*PolyLog[n\_, v\_], x\_Symbol] := With[{w = DerivativeDivides[v, u\*v, x]}, Simp[w\*PolyLog[n + 1, v], x] /; !FalseQ[w]] /; FreeQ[n, x]

### Rule 2500

Int[(Log[(e\_)\*((f\_)\*((a\_) + (b\_)\*(x\_))^(p\_))\*((c\_) + (d\_)\*(x\_))^(q\_))]^(r\_)]\*((s\_) + Log[(i\_)\*((g\_) + (h\_)\*(x\_))^(n\_)]\*(t\_)))/((j\_) + (k\_)\*(x\_)), x\_Symbol] := Dist[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q)^r] - Log[(a + b\*x)^(p\*r)] - Log[(c + d\*x)^(q\*r)], Int[(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x], x] + (Int[(Log[(a + b\*x)^(p\*r)]\*(s + t\*Log[i\*(g + h\*x)^n])]/(j + k\*x), x] + Int[(Log[(c + d\*x)^(q\*r)]\*(s + t\*Log[i\*(g + h\*x)^n])]/(j + k\*x), x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0]

### Rule 2433

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_))^(n\_)]\*(b\_))^(p\_)\*((f\_) + Log[(h\_)\*((i\_) + (j\_)\*(x\_))^(m\_)]\*(g\_))\*((k\_) + (l\_)\*(x\_))^(r\_)), x\_Symbol] := Dist[1/e, Subst[Int[((k\*x)/d)^r\*(a + b\*Log[c\*x^n])^p\*(f + g\*Log[h\*(e\*i - d\*j)/e + (j\*x)/e]^m)], x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e\*k - d\*1, 0]

### Rule 2375

Int[(Log[(d\_)\*((e\_) + (f\_)\*(x\_))^(m\_))]^(r\_)]\*((a\_) + Log[(c\_)\*(x\_))^(n\_)]\*(b\_))^(p\_))/(x\_), x\_Symbol] := Simp[(Log[d\*(e + f\*x^m)^r]\*(a + b\*Log[c\*x^n])^(p + 1))/(b\*n\*(p + 1)), x] - Dist[(f\*m\*r)/(b\*n\*(p + 1)), Int[(x^(m - 1)\*(a + b\*Log[c\*x^n])^(p + 1))/(e + f\*x^m), x], x] /; FreeQ[{a, b, c, d, e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d\*e, 1]

### Rule 2374

Int[(Log[(d\_)\*((e\_) + (f\_)\*(x\_))^(m\_))]\*(a\_) + Log[(c\_)\*(x\_))^(n\_)]\*(b\_))^(p\_))/(x\_), x\_Symbol] := -Simp[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^p)/m, x] + Dist[(b\*n\*p)/m, Int[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0] && EqQ[d\*e, 1]

### Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_Symbol]
:> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d, e, n, p}, x]
&& EqQ[b*d, a*e]
```

### Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol]
:> Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, m, n}, x]
&& IntegerQ[r]
```

### Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol]
:> Simp[Log[x]*(a + b*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Log[x]
*(a + b*Log[c*(d + e*x)^n])]/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x]
*(f + g*Log[h*(i + j*x)^m])]/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, m, n}, x]
&& EqQ[e*i - d*j, 0]
```

### Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.)
]^(r_.))*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/(j_.)
+ (k_.)*(x_)), x_Symbol]
:> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r)]/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dist[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x),
x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x]
&& NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

### Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.)
*(x_)), x_Symbol]
:> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p}, x]
&& NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

### Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)/(x_), x_Symbol]
:> Dist[1/(b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
```

x]

### Rule 30

`Int[(x_)^(m_.), x_Symbol] := Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && NeQ[m, -1]`

### Rubi steps

$$\begin{aligned}
\int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(98c + 98dx)^2(ag + bgx)^3} dx &= \int \left( \frac{b^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9604(bc - ad)^2 g^3 (a + bx)^3} - \frac{b^2 d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4802(bc - ad)^3 g^3 (a + bx)^2} + \frac{3b^2 d^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9604(bc - ad)^4 g^3 (a + bx)} \right) dx \\
&= \frac{(3b^2 d^2) \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx} dx}{9604(bc - ad)^4 g^3} - \frac{(3bd^3) \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx} dx}{9604(bc - ad)^4 g^3} - \frac{(b^2 d) \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^2} dx}{4802(bc - ad)^3 g^3} \\
&= -\frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{19208(bc - ad)^2 g^3 (a + bx)^2} + \frac{bd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4802(bc - ad)^3 g^3 (a + bx)} + \frac{d^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9604(bc - ad)^3 g^3 (c + dx)} \\
&= -\frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{19208(bc - ad)^2 g^3 (a + bx)^2} + \frac{bd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4802(bc - ad)^3 g^3 (a + bx)} + \frac{d^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9604(bc - ad)^3 g^3 (c + dx)} \\
&= -\frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{19208(bc - ad)^2 g^3 (a + bx)^2} + \frac{bd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4802(bc - ad)^3 g^3 (a + bx)} + \frac{d^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9604(bc - ad)^3 g^3 (c + dx)} \\
&= -\frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{19208(bc - ad)^2 g^3 (a + bx)^2} + \frac{bd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4802(bc - ad)^3 g^3 (a + bx)} + \frac{d^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9604(bc - ad)^3 g^3 (c + dx)} \\
&= -\frac{bB \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{19208(bc - ad)^2 g^3 (a + bx)^2} + \frac{5bBd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9604(bc - ad)^3 g^3 (a + bx)} - \frac{Bd^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4802(bc - ad)^3 g^3 (c + dx)} \\
&= -\frac{bB \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{19208(bc - ad)^2 g^3 (a + bx)^2} + \frac{5bBd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9604(bc - ad)^3 g^3 (a + bx)} - \frac{Bd^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4802(bc - ad)^3 g^3 (c + dx)} \\
&= -\frac{3bB^2 d^2 \log(a + bx) \log^2\left(\frac{e(a+bx)}{c+dx}\right)}{9604(bc - ad)^4 g^3} - \frac{bB \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{19208(bc - ad)^2 g^3 (a + bx)^2} + \frac{5bBd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9604(bc - ad)^3 g^3} \\
&= -\frac{bB^2}{38416(bc - ad)^2 g^3 (a + bx)^2} + \frac{11bB^2 d}{19208(bc - ad)^3 g^3 (a + bx)} + \frac{B^2 d^2}{4802(bc - ad)^3 g^3 (c + dx)} \\
&= -\frac{bB^2}{38416(bc - ad)^2 g^3 (a + bx)^2} + \frac{11bB^2 d}{19208(bc - ad)^3 g^3 (a + bx)} + \frac{B^2 d^2}{4802(bc - ad)^3 g^3 (c + dx)} \\
&= -\frac{bB^2}{38416(bc - ad)^2 g^3 (a + bx)^2} + \frac{11bB^2 d}{19208(bc - ad)^3 g^3 (a + bx)} + \frac{B^2 d^2}{4802(bc - ad)^3 g^3 (c + dx)}
\end{aligned}$$

**Mathematica [A]** time = 1.44719, size = 466, normalized size = 0.89

$$-2B(-6a^2bd^2(A(c+dx) - Bdx) + 2a^3Bd^3 - 6ab^2d(2Adx(c+dx) + Bc(c+2dx)) + b^3(B(-3c^2dx + c^3 - 9cd^2x^2 - 3d^3x^3)))$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2/((a\*g + b\*g\*x)^3\*(c\*i + d\*i\*x)^2), x]

[Out] (4\*(A^2 - 2\*A\*B + 2\*B^2)\*d^2\*(b\*c - a\*d)\*(a + b\*x)^2 - b\*(2\*A^2 + 2\*A\*B + B^2)\*(b\*c - a\*d)^2\*(c + d\*x) + 2\*b\*(4\*A^2 + 10\*A\*B + 11\*B^2)\*d\*(b\*c - a\*d)\*(a + b\*x)\*(c + d\*x) + 6\*b\*(2\*A^2 + 2\*A\*B + 5\*B^2)\*d^2\*(a + b\*x)^2\*(c + d\*x)\*Log[a + b\*x] + 2\*B\*(b\*c - a\*d)\*(4\*(A - B)\*d^2\*(a + b\*x)^2 - b\*(2\*A + B)\*(b\*c - a\*d)\*(c + d\*x) + 2\*b\*(4\*A + 5\*B)\*d\*(a + b\*x)\*(c + d\*x))\*Log[(e\*(a + b\*x))/(c + d\*x)] - 2\*B\*(2\*a^3\*B\*d^3 - 6\*a^2\*b\*d^2\*(-(B\*d\*x) + A\*(c + d\*x)) - 6\*a\*b^2\*d\*(2\*A\*d\*x\*(c + d\*x) + B\*c\*(c + 2\*d\*x)) + b^3\*(-6\*A\*d^2\*x^2\*(c + d\*x) + B\*(c^3 - 3\*c^2\*d\*x - 9\*c\*d^2\*x^2 - 3\*d^3\*x^3)))\*Log[(e\*(a + b\*x))/(c + d\*x)]^2 + 4\*b\*B^2\*d^2\*(a + b\*x)^2\*(c + d\*x)\*Log[(e\*(a + b\*x))/(c + d\*x)]^3 - 6\*b\*(2\*A^2 + 2\*A\*B + 5\*B^2)\*d^2\*(a + b\*x)^2\*(c + d\*x)\*Log[c + d\*x]/(4\*(b\*c - a\*d)^4\*g^3\*i^2\*(a + b\*x)^2\*(c + d\*x))

**Maple [B]** time = 0.061, size = 3538, normalized size = 6.8

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^3/(d\*i\*x+c\*i)^2,x)

[Out] -d^4/i^2/(a\*d-b\*c)^5/g^3\*A^2/(d\*x+c)\*a^2-3\*e\*d/i^2/(a\*d-b\*c)^5/g^3\*A^2\*b^3/(b\*e/d+e/(d\*x+c)\*a-e/d/(d\*x+c)\*b\*c)\*c+6\*e\*d^2/i^2/(a\*d-b\*c)^5/g^3\*B^2\*b^2/(b\*e/d+e/(d\*x+c)\*a-e/d/(d\*x+c)\*b\*c)\*a-6\*e\*d/i^2/(a\*d-b\*c)^5/g^3\*B^2\*b^3/(b\*e/d+e/(d\*x+c)\*a-e/d/(d\*x+c)\*b\*c)\*c+3\*d^3/i^2/(a\*d-b\*c)^5/g^3\*A\*B\*b\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))^2\*a-3\*d^2/i^2/(a\*d-b\*c)^5/g^3\*A\*B\*b^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))^2\*c+2\*d^2/i^2/(a\*d-b\*c)^5/g^3\*B^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))/(d\*x+c)\*b^2\*c^2+1/2\*e^2/i^2/(a\*d-b\*c)^5/g^3\*B^2\*b^4/(b\*e/d+e/(d\*x+c)\*a-e/d/(d\*x+c)\*b\*c)^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))\*c-d^2/i^2/(a\*d-b\*c)^5/g^3\*B^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))^2/(d\*x+c)\*b^2\*c^2-2\*d^3/i^2/(a\*d-b\*c)^5/g^3\*A\*B\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))\*b\*a-2\*d^4/i^2/(a\*d-b\*c)^5/g^3\*B^2/(d\*x+c)\*a^2+2\*d^3/i^2/(a\*d-b\*c)^5/g^3\*A\*B\*b\*a-2\*d^2/i^2/(a\*d-b\*c)^5/

$$\begin{aligned}
& g^3 A^3 B^2 b^{2c+2d^2/i^2} / (a^d - b^c)^5 / g^3 A^3 B^2 \ln(b^e/d + (a^d - b^c)e/d / (d^*x+c)) \\
& * b^{2c+1/2} e^{2/i^2} / (a^d - b^c)^5 / g^3 B^2 b^4 / (b^e/d + e / (d^*x+c)) * a^{-e/d} / (d^*x+c) * b^c \\
& ^{2*} \ln(b^e/d + (a^d - b^c)e/d / (d^*x+c))^{2c-2d^4/i^2} / (a^d - b^c)^5 / g^3 A^3 B^2 \ln(b^e/d + (a^d - b^c)e/d / (d^*x+c)) \\
& / (d^*x+c) * a^{2+4d^3/i^2} / (a^d - b^c)^5 / g^3 B^2 / (d^*x+c) * a * b^c + 1/2 * e^{2/i^2} / (a^d - b^c)^5 / g^3 A^3 B^2 b^4 / (b^e/d + e / (d^*x+c)) * a^{-e/d} / (d^*x+c) \\
& * b^c)^{2c+2d^3/i^2} / (a^d - b^c)^5 / g^3 A^2 / (d^*x+c) * a * b^c - 1/2 * e^{2d/i^2} / (a^d - b^c)^5 / g^3 A^2 b^3 / (b^e/d + e / (d^*x+c)) * a^{-e/d} / (d^*x+c) * b^c)^{2a-1/4} * e^{2d/i^2} / (a^d - b^c)^5 / g^3 B^2 b^3 / (b^e/d + e / (d^*x+c)) * a^{-e/d} / (d^*x+c) * b^c)^{2a+3} * e^{2d/i^2} / (a^d - b^c)^5 / g^3 A^2 b^2 / (b^e/d + e / (d^*x+c)) * a^{-e/d} / (d^*x+c) * b^c)^{a+d^3/i^2} / (a^d - b^c)^5 / g^3 B^2 b^2 \ln(b^e/d + (a^d - b^c)e/d / (d^*x+c))^{3a-d^2/i^2} / (a^d - b^c)^5 / g^3 B^2 b^2 \ln(b^e/d + (a^d - b^c)e/d / (d^*x+c))^{3c+2d^2/i^2} / (a^d - b^c)^5 / g^3 A^3 B / (d^*x+c) * b^{2c} * c^2 + 3d^3/i^2 / (a^d - b^c)^5 / g^3 A^2 b^2 \ln(b^e/d + (a^d - b^c)e/d / (d^*x+c)) * c - d^4/i^2 / (a^d - b^c)^5 / g^3 B^2 \ln(b^e/d + (a^d - b^c)e/d / (d^*x+c))^{2/d^*x+c} * a^{2-d^3/i^2} / (a^d - b^c)^5 / g^3 B^2 \ln(b^e/d + (a^d - b^c)e/d / (d^*x+c))^{2*b^*a+d^2/i^2} / (a^d - b^c)^5 / g^3 B^2 \ln(b^e/d + (a^d - b^c)e/d / (d^*x+c))^{2*b^2c+2d^3/i^2} / (a^d - b^c)^5 / g^3 B^2 \ln(b^e/d + (a^d - b^c)e/d / (d^*x+c)) * b^{2c+2d^4/i^2} / (a^d - b^c)^5 / g^3 A^3 B / (d^*x+c) * a^{2+1/2} * e^{2/i^2} / (a^d - b^c)^5 / g^3 A^2 b^4 / (b^e/d + e / (d^*x+c)) * a^{-e/d} / (d^*x+c) * b^c)^{2c-d^2/i^2} / (a^d - b^c)^5 / g^3 A^2 / (d^*x+c) * b^{2c} * c^2 + 1/4 * e^{2/i^2} / (a^d - b^c)^5 / g^3 B^2 b^4 / (b^e/d + e / (d^*x+c)) * a^{-e/d} / (d^*x+c) * b^c)^{2c-2d^2/i^2} / (a^d - b^c)^5 / g^3 B^2 / (d^*x+c) * b^{2c} * c^2 + 2d^4/i^2 / (a^d - b^c)^5 / g^3 B^2 \ln(b^e/d + (a^d - b^c)e/d / (d^*x+c)) / (d^*x+c) * a^{2-d^3/i^2} / (a^d - b^c)^5 / g^3 A^2 b^*a+d^2/i^2} / (a^d - b^c)^5 / g^3 A^2 b^2 c - 2d^3/i^2 / (a^d - b^c)^5 / g^3 B^2 b^*a+2d^2/i^2} / (a^d - b^c)^5 / g^3 B^2 b^2 c - e^{2d/i^2} / (a^d - b^c)^5 / g^3 A^3 B^2 b^3 / (b^e/d + e / (d^*x+c)) * a^{-e/d} / (d^*x+c) * b^c)^{2*} \ln(b^e/d + (a^d - b^c)e/d / (d^*x+c)) * a^{4d^3/i^2} / (a^d - b^c)^5 / g^3 A^3 B^2 \ln(b^e/d + (a^d - b^c)e/d / (d^*x+c)) / (d^*x+c) * b^c * a^{6e^{2d/i^2}} / (a^d - b^c)^5 / g^3 A^3 B^2 b^3 / (b^e/d + e / (d^*x+c)) * a^{-e/d} / (d^*x+c) * b^c) * \ln(b^e/d + (a^d - b^c)e/d / (d^*x+c)) * a^{-6e^{2d/i^2}} / (a^d - b^c)^5 / g^3 A^3 B^2 b^3 / (b^e/d + e / (d^*x+c)) * a^{-e/d} / (d^*x+c) * b^c) * c - 1/2 * e^{2d/i^2} / (a^d - b^c)^5 / g^3 B^2 b^3 / (b^e/d + e / (d^*x+c)) * a^{-e/d} / (d^*x+c) * b^c)^{2*} \ln(b^e/d + (a^d - b^c)e/d / (d^*x+c)) * a^{-3e^{2d/i^2}} / (a^d - b^c)^5 / g^3 B^2 b^3 / (b^e/d + e / (d^*x+c)) * a^{-e/d} / (d^*x+c) * b^c) * \ln(b^e/d + (a^d - b^c)e/d / (d^*x+c))^{2c+6e^{2d/i^2}} / (a^d - b^c)^5 / g^3 B^2 b^2 / (b^e/d + e / (d^*x+c)) * a^{-e/d} / (d^*x+c) * b^c) * \ln(b^e/d + (a^d - b^c)e/d / (d^*x+c)) * a^{-4d^3/i^2} / (a^d - b^c)^5 / g^3 A^3 B / (d^*x+c) * a * b^c - 4d^3/i^2 / (a^d - b^c)^5 / g^3 B^2 \ln(b^e/d + (a^d - b^c)e/d / (d^*x+c)) / (d^*x+c) * b^c * a^{-2d^2/i^2} / (a^d - b^c)^5 / g^3 A^3 B^2 \ln(b^e/d + (a^d - b^c)e/d / (d^*x+c)) / (d^*x+c) * b^{2c} * c^2 - 1/2 * e^{2d/i^2} / (a^d - b^c)^5 / g^3 B^2 b^3 / (b^e/d + e / (d^*x+c)) * a^{-e/d} / (d^*x+c) * b^c)^{2*} \ln(b^e/d + (a^d - b^c)e/d / (d^*x+c))^{2a-6e^{2d/i^2}} / (a^d - b^c)^5 / g^3 B^2 b^3 / (b^e/d + e / (d^*x+c)) * a^{-e/d} / (d^*x+c) * b^c) * \ln(b^e/d + (a^d - b^c)e/d / (d^*x+c)) * c + 3e^{2d/i^2} / (a^d - b^c)^5 / g^3 B^2 b^2 / (b^e/d + e / (d^*x+c)) * a^{-e/d} / (d^*x+c) * b^c) * \ln(b^e/d + (a^d - b^c)e/d / (d^*x+c))^{2a+e^{2/i^2}} / (a^d - b^c)^5 / g^3 A^3 B^2 b^4 / (b^e/d + e / (d^*x+c)) * a^{-e/d} / (d^*x+c) * b^c)^{2*} \ln(b^e/d + (a^d - b^c)e/d / (d^*x+c)) * c + 2d^3/i^2 / (a^d - b^c)^5 / g^3 B^2 \ln(b^e/d + (a^d - b^c)e/d / (d^*x+c))^{2/d^*x+c} * b^c * a^{-1/2} * e^{2d/i^2} / (a^d - b^c)^5 / g^3 A^3 B^2 b^3 / (b^e/d + e / (d^*x+c)) * a^{-e/d} / (d^*x+c) * b^c)^{2
\end{aligned}$$

$*a+6*e*d^2/i^2/(a*d-b*c)^5/g^3*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*$   
 $a$

**Maxima [B]** time = 3.15548, size = 5652, normalized size = 10.81

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^3/(d\*i\*x+c\*i)^2,x, alg  
 orithm="maxima")

[Out]  $1/2*B^2*((6*b^2*d^2*x^2 - b^2*c^2 + 5*a*b*c*d + 2*a^2*d^2 + 3*(b^2*c*d + 3*$   
 $a*b*d^2)*x)/((b^5*c^3*d - 3*a*b^4*c^2*d^2 + 3*a^2*b^3*c^2*d^3 - a^3*b^2*d^4)*$   
 $g^3*i^2*x^3 + (b^5*c^4 - a*b^4*c^3*d - 3*a^2*b^3*c^2*d^2 + 5*a^3*b^2*c*d^3$   
 $- 2*a^4*b*d^4)*g^3*i^2*x^2 + (2*a*b^4*c^4 - 5*a^2*b^3*c^3*d + 3*a^3*b^2*c^2$   
 $*d^2 + a^4*b*c*d^3 - a^5*d^4)*g^3*i^2*x + (a^2*b^3*c^4 - 3*a^3*b^2*c^3*d +$   
 $3*a^4*b*c^2*d^2 - a^5*c*d^3)*g^3*i^2) + 6*b*d^2*log(b*x + a)/((b^4*c^4 - 4*$   
 $a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^3*i^2) - 6*b*d$   
 $^2*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d$   
 $^3 + a^4*d^4)*g^3*i^2))*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2 + A*B*((6*b^$   
 $2*d^2*x^2 - b^2*c^2 + 5*a*b*c*d + 2*a^2*d^2 + 3*(b^2*c*d + 3*a*b*d^2)*x)/(($   
 $b^5*c^3*d - 3*a*b^4*c^2*d^2 + 3*a^2*b^3*c^2*d^3 - a^3*b^2*d^4)*g^3*i^2*x^3 +$   
 $(b^5*c^4 - a*b^4*c^3*d - 3*a^2*b^3*c^2*d^2 + 5*a^3*b^2*c*d^3 - 2*a^4*b*d^4)$   
 $*g^3*i^2*x^2 + (2*a*b^4*c^4 - 5*a^2*b^3*c^3*d + 3*a^3*b^2*c^2*d^2 + a^4*b*c$   
 $*d^3 - a^5*d^4)*g^3*i^2*x + (a^2*b^3*c^4 - 3*a^3*b^2*c^3*d + 3*a^4*b*c^2*d$   
 $^2 - a^5*c*d^3)*g^3*i^2) + 6*b*d^2*log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d +$   
 $6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^3*i^2) - 6*b*d^2*log(d*x + c$   
 $)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*$   
 $g^3*i^2))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 1/4*B^2*(2*(b^3*c^3 - 12*a$   
 $*b^2*c^2*d + 15*a^2*b*c*d^2 - 4*a^3*d^3 - 6*(b^3*c*d^2 - a*b^2*d^3)*x^2 + 6$   
 $*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d$   
 $^2 + a^2*b*d^3)*x)*log(b*x + a)^2 + 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d$   
 $^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(d*x + c)^2 - 3*(3$   
 $*b^3*c^2*d - 2*a*b^2*c*d^2 - a^2*b*d^3)*x - 6*(b^3*d^3*x^3 + a^2*b*c*d^2 +$   
 $(b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a)$   
 $+ 6*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*d^3)*x^2 + (2*a*b^2*$   
 $c*d^2 + a^2*b*d^3)*x - 2*(b^3*d^3*x^3 + a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2*$   
 $d^3)*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*x)*log(b*x + a))*log(d*x + c))*log(b$   
 $e*x/(d*x + c) + a*e/(d*x + c))/(a^2*b^4*c^5*g^3*i^2 - 4*a^3*b^3*c^4*d*g^3*$   
 $i^2 + 6*a^4*b^2*c^3*d^2*g^3*i^2 - 4*a^5*b*c^2*d^3*g^3*i^2 + a^6*c*d^4*g^3*i$   
 $^2 + (b^6*c^4*d*g^3*i^2 - 4*a*b^5*c^3*d^2*g^3*i^2 + 6*a^2*b^4*c^2*d^3*g^3*i$

$$\begin{aligned}
&^2 - 4a^3b^3c^4d^4g^3i^2 + a^4b^2d^5g^3i^2)x^3 + (b^6c^5g^3i^2 \\
&- 2a^5b^4c^4d^4g^3i^2 - 2a^2b^4c^3d^2g^3i^2 + 8a^3b^3c^2d^3g^3i^2 \\
&*i^2 - 7a^4b^2c^4d^4g^3i^2 + 2a^5b^2d^5g^3i^2)x^2 + (2a^5b^3c^5g^3i^2 \\
&- 7a^2b^4c^4d^4g^3i^2 + 8a^3b^3c^3d^2g^3i^2 - 2a^4b^2c^2d^3g^3i^2 \\
&*d^3g^3i^2 - 2a^5b^2c^4d^4g^3i^2 + a^6d^5g^3i^2)x) + (b^3c^3 - 24a \\
&a^b^2c^2d + 15a^2b^3c^2d^2 + 8a^3d^3 - 4(b^3d^3x^3 + a^2b^3c^2d^2 + ( \\
&b^3c^2d^2 + 2a^2b^2d^3)x^2 + (2a^2b^2c^2d^2 + a^2b^2d^3)x)*\log(b^3x + a)^ \\
&3 + 4(b^3d^3x^3 + a^2b^3c^2d^2 + (b^3c^2d^2 + 2a^2b^2d^3)x^2 + (2a^2b^2 \\
&*c^2d^2 + a^2b^2d^3)x)*\log(dx + c)^3 - 30(b^3c^2d^2 - a^2b^2d^3)x^2 + 6* \\
&(b^3d^3x^3 + a^2b^3c^2d^2 + (b^3c^2d^2 + 2a^2b^2d^3)x^2 + (2a^2b^2c^2d^2 \\
&+ a^2b^2d^3)x)*\log(b^3x + a)^2 + 6(b^3d^3x^3 + a^2b^3c^2d^2 + (b^3c^2d^2 \\
&+ 2a^2b^2d^3)x^2 + (2a^2b^2c^2d^2 + a^2b^2d^3)x - 2(b^3d^3x^3 + a^2* \\
&b^3c^2d^2 + (b^3c^2d^2 + 2a^2b^2d^3)x^2 + (2a^2b^2c^2d^2 + a^2b^2d^3)x)*\log \\
&(b^3x + a))*\log(dx + c)^2 - 3(7b^3c^2d^2 + 6a^2b^2c^2d^2 - 13a^2b^2d^3) \\
&*x - 30(b^3d^3x^3 + a^2b^3c^2d^2 + (b^3c^2d^2 + 2a^2b^2d^3)x^2 + (2a^2b \\
&^2c^2d^2 + a^2b^2d^3)x)*\log(b^3x + a) + 6(5b^3d^3x^3 + 5a^2b^3c^2d^2 + \\
&5(b^3c^2d^2 + 2a^2b^2d^3)x^2 + 2(b^3d^3x^3 + a^2b^3c^2d^2 + (b^3c^2d^2 \\
&+ 2a^2b^2d^3)x^2 + (2a^2b^2c^2d^2 + a^2b^2d^3)x)*\log(b^3x + a)^2 + 5(2* \\
&a^2b^2c^2d^2 + a^2b^2d^3)x - 2(b^3d^3x^3 + a^2b^3c^2d^2 + (b^3c^2d^2 + 2* \\
&a^2b^2d^3)x^2 + (2a^2b^2c^2d^2 + a^2b^2d^3)x)*\log(b^3x + a))*\log(dx + c)) \\
&/ (a^2b^4c^5g^3i^2 - 4a^3b^3c^4d^4g^3i^2 + 6a^4b^2c^3d^2g^3i^2 \\
&- 4a^5b^2c^2d^3g^3i^2 + a^6c^4d^4g^3i^2 + (b^6c^4d^4g^3i^2 - 4a^5b \\
&^5c^3d^2g^3i^2 + 6a^2b^4c^2d^3g^3i^2 - 4a^3b^3c^2d^4g^3i^2 + \\
&a^4b^2d^5g^3i^2)x^3 + (b^6c^5g^3i^2 - 2a^5b^4c^4d^4g^3i^2 - 2a^2 \\
&*b^4c^3d^2g^3i^2 + 8a^3b^3c^2d^3g^3i^2 - 7a^4b^2c^4d^4g^3i^2 \\
&+ 2a^5b^2d^5g^3i^2)x^2 + (2a^5b^3c^5g^3i^2 - 7a^2b^4c^4d^4g^3i^2 \\
&+ 8a^3b^3c^3d^2g^3i^2 - 2a^4b^2c^2d^3g^3i^2 - 2a^5b^2c^4d^4g^3i^2 \\
&+ a^6d^5g^3i^2)x) + 1/2A^2*((6b^2d^2x^2 - b^2c^2 + 5a^2b^3c^2 \\
&d + 2a^2d^2 + 3(b^2c^2d + 3a^2b^2d^2)x)/((b^5c^3d - 3a^2b^4c^2d^2 + \\
&3a^2b^3c^2d^3 - a^3b^2d^4)*g^3i^2x^3 + (b^5c^4 - a^2b^4c^3d - 3a^2 \\
&*b^3c^2d^2 + 5a^3b^2c^2d^3 - 2a^4b^2d^4)*g^3i^2x^2 + (2a^2b^4c^4 - \\
&5a^2b^3c^3d + 3a^3b^2c^2d^2 + a^4b^2c^2d^3 - a^5d^4)*g^3i^2x + (a \\
&^2b^3c^4 - 3a^3b^2c^3d + 3a^4b^2c^2d^2 - a^5c^2d^3)*g^3i^2) + 6b^2 \\
&d^2*\log(b^3x + a)/((b^4c^4 - 4a^2b^3c^3d + 6a^2b^2c^2d^2 - 4a^3b^2c^2 \\
&d^3 + a^4d^4)*g^3i^2) - 6b^2d^2*\log(dx + c)/((b^4c^4 - 4a^2b^3c^3d + \\
&6a^2b^2c^2d^2 - 4a^3b^2c^2d^3 + a^4d^4)*g^3i^2)) - 1/2(b^3c^3 - 12* \\
&a^2b^2c^2d + 15a^2b^3c^2d^2 - 4a^3d^3 - 6(b^3c^2d^2 - a^2b^2d^3)x^2 + \\
&6(b^3d^3x^3 + a^2b^3c^2d^2 + (b^3c^2d^2 + 2a^2b^2d^3)x^2 + (2a^2b^2c^2d \\
&^2 + a^2b^2d^3)x)*\log(b^3x + a)^2 + 6(b^3d^3x^3 + a^2b^3c^2d^2 + (b^3c^2d \\
&^2 + 2a^2b^2d^3)x^2 + (2a^2b^2c^2d^2 + a^2b^2d^3)x)*\log(dx + c)^2 - 3( \\
&3b^3c^2d - 2a^2b^2c^2d^2 - a^2b^2d^3)x - 6(b^3d^3x^3 + a^2b^3c^2d^2 + \\
&(b^3c^2d^2 + 2a^2b^2d^3)x^2 + (2a^2b^2c^2d^2 + a^2b^2d^3)x)*\log(b^3x + a \\
&)) + 6(b^3d^3x^3 + a^2b^3c^2d^2 + (b^3c^2d^2 + 2a^2b^2d^3)x^2 + (2a^2b^2 \\
&*c^2d^2 + a^2b^2d^3)x - 2(b^3d^3x^3 + a^2b^3c^2d^2 + (b^3c^2d^2 + 2a^2b^2 \\
&*d^3)x^2 + (2a^2b^2c^2d^2 + a^2b^2d^3)x)*\log(b^3x + a))*\log(dx + c))*A^2B/
\end{aligned}$$



$$(a^2b^4c^5g^3i^2 - 4a^3b^3c^4d^2g^3i^2 + 6a^4b^2c^3d^2g^3i^2 - 4a^5b^2c^2d^3g^3i^2 + a^6c^4d^4g^3i^2 + (b^6c^4d^2g^3i^2 - 4a^5b^5c^3d^2g^3i^2 + 6a^2b^4c^2d^3g^3i^2 - 4a^3b^3c^4d^4g^3i^2 + a^4b^2d^5g^3i^2)*x^3 + (b^6c^5g^3i^2 - 2a^5b^5c^4d^2g^3i^2 - 2a^2b^4c^3d^2g^3i^2 + 8a^3b^3c^2d^3g^3i^2 - 7a^4b^2c^4d^4g^3i^2 + 2a^5b^2d^5g^3i^2)*x^2 + (2a^5b^5c^5g^3i^2 - 7a^2b^4c^4d^4g^3i^2 + 8a^3b^3c^3d^2g^3i^2 - 2a^4b^2c^2d^3g^3i^2 - 2a^5b^2c^4d^4g^3i^2 + a^6d^5g^3i^2)*x)$$

**Fricas [A]** time = 0.590522, size = 2061, normalized size = 3.94

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^3/(d\*i\*x+c\*i)^2,x, algorithm="fricas")

[Out] 
$$\begin{aligned} & -1/4*((2A^2 + 2AB + B^2)*b^3c^3 - 12*(A^2 + 2AB + 2B^2)*a*b^2c^2d \\ & + 3*(2A^2 + 10AB + 5B^2)*a^2b*c*d^2 + 4*(A^2 - 2AB + 2B^2)*a^3d^3 \\ & - 4*(B^2b^3d^3x^3 + B^2a^2b*c*d^2 + (B^2b^3c*d^2 + 2B^2a*b^2d^3)* \\ & x^2 + (2B^2a*b^2c*d^2 + B^2a^2b*d^3)*x)*\log((b*e*x + a*e)/(d*x + c))^3 \\ & - 6*((2A^2 + 2AB + 5B^2)*b^3c*d^2 - (2A^2 + 2AB + 5B^2)*a*b^2d^3 \\ & )*x^2 - 2*(3*(2AB + B^2)*b^3d^3x^3 - B^2b^3c^3 + 6B^2a*b^2c^2d \\ & + 6AB*a^2b*c*d^2 - 2B^2a^3d^3 + 3*(4AB*a*b^2d^3 + (2AB + 3B^2)*b^3 \\ & c*d^2)*x^2 + 3*(B^2b^3c^2d + 4*(AB + B^2)*a*b^2c*d^2 + 2*(AB - B^2) \\ & )*a^2b*d^3)*x)*\log((b*e*x + a*e)/(d*x + c))^2 - 3*((2A^2 + 6AB + 7B^2)* \\ & b^3c^2d + 2*(2A^2 - 2AB + 3B^2)*a*b^2c*d^2 - (6A^2 + 2AB + 13B^2) \\ & )*a^2b*d^3)*x - 2*(3*(2A^2 + 2AB + 5B^2)*b^3d^3x^3 + 6A^2a^2b*c*d \\ & ^2 - (2AB + B^2)*b^3c^3 + 12*(AB + B^2)*a*b^2c^2d - 4*(AB - B^2)*a^3 \\ & *d^3 + 3*((2A^2 + 6AB + 7B^2)*b^3c*d^2 + 4*(A^2 + 2B^2)*a*b^2d^3)*x^2 \\ & + 3*((2AB + 3B^2)*b^3c^2d + 4*(A^2 + 2AB + 2B^2)*a*b^2c*d^2 + 2* \\ & (A^2 - 2AB + 2B^2)*a^2b*d^3)*x)*\log((b*e*x + a*e)/(d*x + c)))/((b^6c^4 \\ & *d - 4a^5b^5c^3d^2 + 6a^2b^4c^2d^3 - 4a^3b^3c^4d + a^4b^2d^5)*g \\ & ^3i^2*x^3 + (b^6c^5 - 2a^5b^5c^4d - 2a^2b^4c^3d^2 + 8a^3b^3c^2d \\ & ^3 - 7a^4b^2c^4d + 2a^5b^2d^5)*g^3i^2*x^2 + (2a^5b^5c^5 - 7a^2b^4c^4 \\ & *d + 8a^3b^3c^3d^2 - 2a^4b^2c^2d^3 - 2a^5b^2c^4d + a^6d^5)*g^3 \\ & i^2*x + (a^2b^4c^5 - 4a^3b^3c^4d + 6a^4b^2c^3d^2 - 4a^5b^2c^2 \\ & d^3 + a^6c^4d)*g^3i^2) \end{aligned}$$

**Sympy [B]** time = 65.5382, size = 2683, normalized size = 5.13

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*(b\*x+a)/(d\*x+c)))\*\*2/(b\*g\*x+a\*g)\*\*3/(d\*i\*x+c\*i)\*\*2,x)

[Out] 
$$B^2 b^2 d^2 \log\left(\frac{e(a+bx)}{c+dx}\right)^3 / (a^4 d^4 g^3 i^2 - 4 a^3 b^3 c^3 d g^3 i^2 + b^4 c^4 g^3 i^2) - 3 b^2 d^2 (2 A^2 + 2 A B + 5 B^2) \log(x + (6 A^2 a b d^3 + 6 A^2 b^2 c d^2 + 6 A B a b d^3 + 6 A B b^2 c d^2 + 15 B^2 a b d^3 + 15 B^2 b^2 c d^2 - 3 a^5 b d^7 (2 A^2 + 2 A B + 5 B^2)) / (a d - b c)^4 + 15 a^4 b^2 c d^6 (2 A^2 + 2 A B + 5 B^2) / (a d - b c)^4 - 30 a^3 b^3 c^2 d^5 (2 A^2 + 2 A B + 5 B^2) / (a d - b c)^4 + 30 a^2 b^4 c^3 d^4 (2 A^2 + 2 A B + 5 B^2) / (a d - b c)^4 - 15 a b^5 c^4 d^3 (2 A^2 + 2 A B + 5 B^2) / (a d - b c)^4 + 3 b^6 c^5 d^2 (2 A^2 + 2 A B + 5 B^2) / (a d - b c)^4) / (12 A^2 b^2 d^3 + 12 A B b^2 d^3 + 30 B^2 b^2 d^3) / (2 g^3 i^2 (a d - b c)^4) + 3 b^2 d^2 (2 A^2 + 2 A B + 5 B^2) \log(x + (6 A^2 a b d^3 + 6 A^2 b^2 c d^2 + 6 A B a b d^3 + 6 A B b^2 c d^2 + 15 B^2 a b d^3 + 15 B^2 b^2 c d^2 + 3 a^5 b d^7 (2 A^2 + 2 A B + 5 B^2)) / (a d - b c)^4 - 15 a^4 b^2 c d^6 (2 A^2 + 2 A B + 5 B^2) / (a d - b c)^4 + 30 a^3 b^3 c^2 d^5 (2 A^2 + 2 A B + 5 B^2) / (a d - b c)^4 - 30 a^2 b^4 c^3 d^4 (2 A^2 + 2 A B + 5 B^2) / (a d - b c)^4 + 15 a b^5 c^4 d^3 (2 A^2 + 2 A B + 5 B^2) / (a d - b c)^4 - 3 b^6 c^5 d^2 (2 A^2 + 2 A B + 5 B^2) / (a d - b c)^4) / (12 A^2 b^2 d^3 + 12 A B b^2 d^3 + 30 B^2 b^2 d^3) / (2 g^3 i^2 (a d - b c)^4) + (-4 A B a^2 d^2 - 10 A B a b c d - 18 A B a b d^2 x + 2 A B b^2 c^2 - 6 A B b^2 c d x - 12 A B b^2 d^2 x^2 + 4 B^2 a^2 d^2 - 11 B^2 a b c d - 3 B^2 a b d^2 x + B^2 b^2 c^2 - 9 B^2 b^2 c d x - 6 B^2 b^2 d^2 x^2) \log\left(\frac{e(a+bx)}{c+dx}\right) / (2 a^5 c d^3 g^3 i^2 + 2 a^5 d^4 g^3 i^2 x - 6 a^4 b c^2 d^2 g^3 i^2 - 2 a^4 b c d^3 g^3 i^2 x + 4 a^4 b d^4 g^3 i^2 x^2 + 6 a^3 b^2 c^3 d g^3 i^2 - 6 a^3 b^2 c^2 d^2 g^3 i^2 x - 10 a^3 b^2 c d^3 g^3 i^2 x^2 + 2 a^3 b^2 d^4 g^3 i^2 x^3 - 2 a^2 b^3 c^4 g^3 i^2 + 10 a^2 b^3 c^3 d g^3 i^2 x + 6 a^2 b^3 c^2 d^2 g^3 i^2 x^2 - 6 a^2 b^3 c d^3 g^3 i^2 x^3 - 4 a b^4 c^4 g^3 i^2 x + 2 a b^4 c^3 d g^3 i^2 x^2 + 6 a b^4 c^2 d^2 g^3 i^2 x^3 - 2 b^5 c^4 g^3 i^2 x^2 - 2 b^5 c^3 d g^3 i^2 x^3) + (6 A B a^2 b c d^2 + 6 A B a^2 b d^3 x + 12 A B a b^2 c d^2 x + 12 A B a b^2 d^3 x^2 + 6 A B b^3 c d^2 x^2 + 6 A B b^3 d^3 x^3 - 2 B^2 a^3 d^3 - 6 B^2 a^2 b d^3 x + 6 B^2 a b^2 c^2 d + 12 B^2 a b^2 c d^2 x - B^2 b^3 c^3 + 3 B^2 b^3 c^2 d x + 9 B^2 b^3 c d^2 x^2 + 3 B^2 b^3 d^3 x^3) \log\left(\frac{e(a+bx)}{c+dx}\right)^2 / (2 a^6 c d^4 g^3 i^2 + 2 a^6 d^5 g^3 i^2 x - 8 a^5 b c^2 d^3 g^3$$

```

3*i**2 - 4*a**5*b*c*d**4*g**3*i**2*x + 4*a**5*b*d**5*g**3*i**2*x**2 + 12*a*
*4*b**2*c**3*d**2*g**3*i**2 - 4*a**4*b**2*c**2*d**3*g**3*i**2*x - 14*a**4*b
**2*c*d**4*g**3*i**2*x**2 + 2*a**4*b**2*d**5*g**3*i**2*x**3 - 8*a**3*b**3*c
**4*d*g**3*i**2 + 16*a**3*b**3*c**3*d**2*g**3*i**2*x + 16*a**3*b**3*c**2*d
**3*g**3*i**2*x**2 - 8*a**3*b**3*c*d**4*g**3*i**2*x**3 + 2*a**2*b**4*c**5*g
**3*i**2 - 14*a**2*b**4*c**4*d*g**3*i**2*x - 4*a**2*b**4*c**3*d**2*g**3*i**2
*x**2 + 12*a**2*b**4*c**2*d**3*g**3*i**2*x**3 + 4*a*b**5*c**5*g**3*i**2*x -
4*a*b**5*c**4*d*g**3*i**2*x**2 - 8*a*b**5*c**3*d**2*g**3*i**2*x**3 + 2*b**
6*c**5*g**3*i**2*x**2 + 2*b**6*c**4*d*g**3*i**2*x**3) - (4*A**2*a**2*d**2 +
10*A**2*a*b*c*d - 2*A**2*b**2*c**2 - 8*A*B*a**2*d**2 + 22*A*B*a*b*c*d - 2*
A*B*b**2*c**2 + 8*B**2*a**2*d**2 + 23*B**2*a*b*c*d - B**2*b**2*c**2 + x**2*
(12*A**2*b**2*d**2 + 12*A*B*b**2*d**2 + 30*B**2*b**2*d**2) + x*(18*A**2*a*b
*d**2 + 6*A**2*b**2*c*d + 6*A*B*a*b*d**2 + 18*A*B*b**2*c*d + 39*B**2*a*b*d*
*2 + 21*B**2*b**2*c*d))/(4*a**5*c*d**3*g**3*i**2 - 12*a**4*b*c**2*d**2*g**3
*i**2 + 12*a**3*b**2*c**3*d*g**3*i**2 - 4*a**2*b**3*c**4*g**3*i**2 + x**3*(
4*a**3*b**2*d**4*g**3*i**2 - 12*a**2*b**3*c*d**3*g**3*i**2 + 12*a*b**4*c**2
*d**2*g**3*i**2 - 4*b**5*c**3*d*g**3*i**2) + x**2*(8*a**4*b*d**4*g**3*i**2
- 20*a**3*b**2*c*d**3*g**3*i**2 + 12*a**2*b**3*c**2*d**2*g**3*i**2 + 4*a*b
**4*c**3*d*g**3*i**2 - 4*b**5*c**4*g**3*i**2) + x*(4*a**5*d**4*g**3*i**2 - 4
*a**4*b*c*d**3*g**3*i**2 - 12*a**3*b**2*c**2*d**2*g**3*i**2 + 20*a**2*b**3*
c**3*d*g**3*i**2 - 8*a*b**4*c**4*g**3*i**2))

```

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B \log\left(\frac{bx+a}{dx+c}\right) + A\right)^2}{(bgx + ag)^3 (dix + ci)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```

[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x, alg
orithm="giac")

```

```

[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/((b*g*x + a*g)^3*(d*i*x + c*
i)^2), x)

```

$$3.99 \quad \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^4(ci+dix)^2} dx$$

**Optimal.** Leaf size=682

$$\frac{6b^2d^2(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{g^4i^2(a+bx)(bc-ad)^5} - \frac{12b^2Bd^2(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^4i^2(a+bx)(bc-ad)^5} - \frac{b^4(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{3g^4i^2(a+bx)^3(bc-ad)^5} - \frac{2b^4(c+dx)^3}{3g^4i^2(a+bx)^3(bc-ad)^5}$$

[Out]  $(-2ABd^4(a+bx))/((b^2c-ad)^5g^4i^2(c+dx)) + (2B^2d^4(a+bx))/((b^2c-ad)^5g^4i^2(c+dx)) - (12b^2B^2d^2(c+dx))/((b^2c-ad)^5g^4i^2(a+bx)) + (b^3B^2d^2(c+dx)^2)/((b^2c-ad)^5g^4i^2(a+bx)^2) - (2b^4B^2(c+dx)^3)/(27(b^2c-ad)^5g^4i^2(a+bx)^3) - (2B^2d^4(a+bx)*\text{Log}[(e(a+bx))/(c+dx)])/((b^2c-ad)^5g^4i^2(c+dx)) - (12b^2B^2d^2(c+dx)*(A+B*\text{Log}[(e(a+bx))/(c+dx)]))/((b^2c-ad)^5g^4i^2(a+bx)) + (2b^3B^2d^2(c+dx)^2*(A+B*\text{Log}[(e(a+bx))/(c+dx)]))/((b^2c-ad)^5g^4i^2(a+bx)^2) - (2b^4B^2(c+dx)^3*(A+B*\text{Log}[(e(a+bx))/(c+dx)]))/((9(b^2c-ad)^5g^4i^2(a+bx)^3) + (d^4(a+bx)*(A+B*\text{Log}[(e(a+bx))/(c+dx)]^2)/((b^2c-ad)^5g^4i^2(c+dx)) - (6b^2d^2(c+dx)*(A+B*\text{Log}[(e(a+bx))/(c+dx)]^2)/((b^2c-ad)^5g^4i^2(a+bx)) + (2b^3d^2(c+dx)^2*(A+B*\text{Log}[(e(a+bx))/(c+dx)]^2)/((b^2c-ad)^5g^4i^2(a+bx)^2) - (b^4(c+dx)^3*(A+B*\text{Log}[(e(a+bx))/(c+dx)]^2)/(3(b^2c-ad)^5g^4i^2(a+bx)^3) - (4b^2d^3*(A+B*\text{Log}[(e(a+bx))/(c+dx)]^3)/(3B*(b^2c-ad)^5g^4i^2)$

**Rubi [C]** time = 9.47853, antiderivative size = 2222, normalized size of antiderivative = 3.26, number of steps used = 177, number of rules used = 31, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.738$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

[In]  $\text{Int}[(A + B*\text{Log}[(e(a+bx))/(c+dx)])^2/((a*g + b*g*x)^4*(c*i + d*i*x)^2), x]$

[Out]  $(-2b^2B^2)/(27(b^2c-ad)^2g^4i^2(a+bx)^3) + (7b^2B^2d)/(9(b^2c-ad)^3g^4i^2(a+bx)^2) - (92b^2B^2d^2)/(9(b^2c-ad)^4g^4i^2(a+bx))$

$$\begin{aligned}
& *x)) - (2*B^2*d^3)/((b*c - a*d)^4*g^4*i^2*(c + d*x)) - (110*b*B^2*d^3*Log[a \\
& + b*x])/((9*(b*c - a*d)^5*g^4*i^2) + (4*A*b*B*d^3*Log[a + b*x]^2)/((b*c - a \\
& *d)^5*g^4*i^2) + (10*b*B^2*d^3*Log[a + b*x]^2)/(3*(b*c - a*d)^5*g^4*i^2) - \\
& (4*b*B^2*d^3*Log[a + b*x]*Log[(c + d*x)^{-1}]^2)/((b*c - a*d)^5*g^4*i^2) + \\
& (4*b*B^2*d^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^{-1}]^2)/((b*c \\
& - a*d)^5*g^4*i^2) + (4*b*B^2*d^3*Log[-((b*c - a*d)/(d*(a + b*x))])*Log[(e* \\
& (a + b*x))/(c + d*x)]^2)/((b*c - a*d)^5*g^4*i^2) + (4*b*B^2*d^3*Log[a + b*x \\
& ]*Log[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^5*g^4*i^2) - (2*b*B*(A + B*L \\
& og[(e*(a + b*x))/(c + d*x)]))/((9*(b*c - a*d)^2*g^4*i^2*(a + b*x)^3) + (4*b* \\
& B*d*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((3*(b*c - a*d)^3*g^4*i^2*(a + b*x \\
& )^2) - (26*b*B*d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((3*(b*c - a*d)^4*g \\
& ^4*i^2*(a + b*x)) + (2*B*d^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - \\
& a*d)^4*g^4*i^2*(c + d*x)) - (20*b*B*d^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x \\
& ))/(c + d*x)]))/((3*(b*c - a*d)^5*g^4*i^2) - (b*(A + B*Log[(e*(a + b*x))/(c \\
& + d*x)]^2)/((3*(b*c - a*d)^2*g^4*i^2*(a + b*x)^3) + (b*d*(A + B*Log[(e*(a + \\
& b*x))/(c + d*x)]^2)/((b*c - a*d)^3*g^4*i^2*(a + b*x)^2) - (3*b*d^2*(A + B \\
& *Log[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^4*g^4*i^2*(a + b*x)) - (d^3* \\
& (A + B*Log[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^4*g^4*i^2*(c + d*x)) - \\
& (4*b*d^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d) \\
& ^5*g^4*i^2) + (110*b*B^2*d^3*Log[c + d*x])/((9*(b*c - a*d)^5*g^4*i^2) - (4*b \\
& *B^2*d^3*Log[a + b*x]^2*Log[c + d*x])/((b*c - a*d)^5*g^4*i^2) - (8*A*b*B*d^3 \\
& *Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)^5*g^4*i^2) - \\
& (20*b*B^2*d^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((3*(b*c - a* \\
& d)^5*g^4*i^2) - (8*b*B^2*d^3*Log[a + b*x]*Log[(c + d*x)^{-1}]*Log[c + d*x]) \\
& /((b*c - a*d)^5*g^4*i^2) + (8*b*B^2*d^3*Log[-((d*(a + b*x))/(b*c - a*d))]*( \\
& Log[a + b*x] + Log[(c + d*x)^{-1}] - Log[(e*(a + b*x))/(c + d*x)]*Log[c + \\
& d*x])/((b*c - a*d)^5*g^4*i^2) + (20*b*B*d^3*(A + B*Log[(e*(a + b*x))/(c + d \\
& *x)]*Log[c + d*x])/((3*(b*c - a*d)^5*g^4*i^2) + (4*b*d^3*(A + B*Log[(e*(a + \\
& b*x))/(c + d*x)]^2*Log[c + d*x])/((b*c - a*d)^5*g^4*i^2) + (4*A*b*B*d^3*L \\
& og[c + d*x]^2)/((b*c - a*d)^5*g^4*i^2) + (10*b*B^2*d^3*Log[c + d*x]^2)/(3*( \\
& b*c - a*d)^5*g^4*i^2) - (4*b*B^2*d^3*Log[a + b*x]*Log[c + d*x]^2)/((b*c - a \\
& *d)^5*g^4*i^2) + (4*b*B^2*d^3*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x]^2)/ \\
& ((b*c - a*d)^5*g^4*i^2) + (4*b*B^2*d^3*Log[c + d*x]^3)/(3*(b*c - a*d)^5*g^4 \\
& *i^2) - (8*A*b*B*d^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a \\
& *d)^5*g^4*i^2) - (20*b*B^2*d^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)]) \\
& /((3*(b*c - a*d)^5*g^4*i^2) + (4*b*B^2*d^3*Log[a + b*x]^2*Log[(b*(c + d*x))/ \\
& (b*c - a*d)])/((b*c - a*d)^5*g^4*i^2) - (8*A*b*B*d^3*PolyLog[2, -((d*(a + b \\
& *x))/(b*c - a*d))])/((b*c - a*d)^5*g^4*i^2) - (20*b*B^2*d^3*PolyLog[2, -((d \\
& *(a + b*x))/(b*c - a*d))])/((3*(b*c - a*d)^5*g^4*i^2) + (8*b*B^2*d^3*Log[a + \\
& b*x]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^5*g^4*i^2) - ( \\
& 8*A*b*B*d^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^5*g^4*i^2) \\
& - (20*b*B^2*d^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((3*(b*c - a*d)^5*g^4 \\
& *i^2) - (8*b*B^2*d^3*Log[(c + d*x)^{-1}]*PolyLog[2, (b*(c + d*x))/(b*c - a* \\
& d)])/((b*c - a*d)^5*g^4*i^2) + (8*b*B^2*d^3*(Log[a + b*x] + Log[(c + d*x)^{- \\
& -1}] - Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])
\end{aligned}$$

$$\frac{((b*c - a*d)^5*g^4*i^2) - (8*b*B^2*d^3*Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])}{((b*c - a*d)^5*g^4*i^2) - (8*b*B^2*d^3*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])} \frac{((b*c - a*d)^5*g^4*i^2) - (8*b*B^2*d^3*PolyLog[3, (b*(c + d*x))/(b*c - a*d])}{((b*c - a*d)^5*g^4*i^2) - (8*b*B^2*d^3*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])} \frac{((b*c - a*d)^5*g^4*i^2) - (8*b*B^2*d^3*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])}{((b*c - a*d)^5*g^4*i^2)}$$
Rule 2528

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x] }, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :=> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n]]^p, RFx, x]},
Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :=> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :=> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :=> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e^n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))])*(b_.)/((f_.) + (g_.)*(x_)), x_
Symbol] :=> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :=> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rule 6688

```
Int[u_, x_Symbol] :=> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]
```

### Rule 6742

```
Int[u_, x_Symbol] :=> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_.) + (g\_.)\*(x\_))^(q\_.)\*((h\_.) + (i\_.)\*(x\_))^(r\_.), x\_Symbol] := Dist[1/e, Subst[Int[((g\*x)/e)^q\*((e\*h - d\*i)/e + (i\*x)/e)^r\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e\*f - d\*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2\*r]

Rule 2344

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/((x\_)\*((d\_) + (e\_.)\*(x\_))), x\_Symbol] := Dist[1/d, Int[(a + b\*Log[c\*x^n])^p/x, x], x] - Dist[e/d, Int[(a + b\*Log[c\*x^n])^p/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

Rule 2317

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/((d\_) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^p)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

Rule 2507

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.)\*Log[(i\_.)\*((j\_.)\*((g\_.) + (h\_.)\*(x\_))^(t\_.))^(u\_.)]\*(v\_), x\_Symbol] := With[{k = Simplify[v\*(a + b\*x)\*(c + d\*x)]}, Simp[(k\*Log[i\*(j\*(g + h\*x)^t]^u)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s + 1))/(p\*r\*(s + 1)\*(b\*c - a\*d)), x] - Dist[(k\*h\*t\*u)/(p\*r\*(s + 1)\*(b\*c - a\*d)), Int[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s + 1)/(g + h\*x), x], x] /; FreeQ[k, x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && NeQ[s, -1]

Rule 2488

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.)/((g\_.) + (h\_.)\*(x\_)), x\_Symbol] := -Simp[(Log[-(b\*c - a\*d)/(d\*(a + b\*x))]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/h, x] + Dist[(p\*r\*s\*(b\*c - a\*d))/h, Int[(Log[-(b\*c - a\*d)/(d\*(a + b\*x))]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1))/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && EqQ[b\*g - a\*h, 0] && IGtQ[s, 0]



Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] := With[{g = Simplify[(v - 1)*(c + d*x)/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/(b*c - a*d), x] + Dist[h*p*r*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s - 1)/(a + b*x)*(c + d*x), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] := With[{w = DerivativeDivides[v, u*v, x]}, Simp[w*PolyLog[n + 1, v], x] /; !FalseQ[w] /; FreeQ[n, x]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))^(r_.)]*(s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))/((j_.) + (k_.)*(x_)), x_Symbol] := Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r] - Log[(a + b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n])/(j + k*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n])/(j + k*x), x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Symbol] := Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(e*i - d*j)/e + (j*x)/e]^m), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*1, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_.) + (f_.)*(x_))^(m_.))^(r_.)]*(a_.) + Log[(c_.)*(x_))^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] := Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m - 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d, e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_.) + (f_.)*(x_))^(m_.))]*(a_.) + Log[(c_.)*(x_))^(n_.)]*(b
```

```

_))^(p_)))/(x_), x_Symbol] := -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]

```

### Rule 6589

```

Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]

```

### Rule 2440

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :=
Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*1)/1) + (e*x)/1)^n])*(f +
g*Log[h*(-((j*k - i*1)/1) + (j*x)/1)^m]), x], x, k + l*x], x] /; FreeQ[{a,
b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]

```

### Rule 2434

```

Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] := Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n])]/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m])]/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]

```

### Rule 2499

```

Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.)
+ (k_.)*(x_)), x_Symbol] := Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q]^r)/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]

```

### Rule 2396

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_))/((f_.) + (g_.)
*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d

```

, e, f, g, n, p}, x] && NeQ[e\*f - d\*g, 0] && IGtQ[p, 1]

### Rule 2302

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/(x\_), x\_Symbol] := Dist[1/(b\*n), Subst[Int[x^p, x], x, a + b\*Log[c\*x^n]], x] /; FreeQ[{a, b, c, n, p}, x]

### Rule 30

Int[(x\_)^(m\_.), x\_Symbol] := Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && NeQ[m, -1]

### Rubi steps

$$\begin{aligned}
\int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(99c + 99dx)^2(ag + bgx)^4} dx &= \int \left( \frac{b^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9801(bc - ad)^2 g^4 (a + bx)^4} - \frac{2b^2 d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9801(bc - ad)^3 g^4 (a + bx)^3} + \frac{b^2 d^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3267(bc - ad)^4 g^4 (a + bx)^2} \right. \\
&= -\frac{(4b^2 d^3) \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx} dx}{9801(bc - ad)^5 g^4} + \frac{(4bd^4) \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx} dx}{9801(bc - ad)^5 g^4} + \frac{(b^2 d^2) \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^2} dx}{3267(bc - ad)^5 g^4} \\
&= -\frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{29403(bc - ad)^2 g^4 (a + bx)^3} + \frac{bd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9801(bc - ad)^3 g^4 (a + bx)^2} - \frac{bd^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3267(bc - ad)^4 g^4 (a + bx)} \\
&= -\frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{29403(bc - ad)^2 g^4 (a + bx)^3} + \frac{bd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9801(bc - ad)^3 g^4 (a + bx)^2} - \frac{bd^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3267(bc - ad)^4 g^4 (a + bx)} \\
&= -\frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{29403(bc - ad)^2 g^4 (a + bx)^3} + \frac{bd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9801(bc - ad)^3 g^4 (a + bx)^2} - \frac{bd^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3267(bc - ad)^4 g^4 (a + bx)} \\
&= -\frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{29403(bc - ad)^2 g^4 (a + bx)^3} + \frac{bd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{9801(bc - ad)^3 g^4 (a + bx)^2} - \frac{bd^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3267(bc - ad)^4 g^4 (a + bx)} \\
&= -\frac{2bB \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{88209(bc - ad)^2 g^4 (a + bx)^3} + \frac{4bBd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{29403(bc - ad)^3 g^4 (a + bx)^2} - \frac{26bBd^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{29403(bc - ad)^4 g^4 (a + bx)} \\
&= -\frac{2bB \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{88209(bc - ad)^2 g^4 (a + bx)^3} + \frac{4bBd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{29403(bc - ad)^3 g^4 (a + bx)^2} - \frac{26bBd^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{29403(bc - ad)^4 g^4 (a + bx)} \\
&= \frac{4bB^2 d^3 \log(a + bx) \log^2\left(\frac{e(a+bx)}{c+dx}\right)}{9801(bc - ad)^5 g^4} - \frac{2bB \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{88209(bc - ad)^2 g^4 (a + bx)^3} + \frac{4bBd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{29403(bc - ad)^3 g^4 (a + bx)^2} \\
&= -\frac{2bB^2}{264627(bc - ad)^2 g^4 (a + bx)^3} + \frac{7bB^2 d}{88209(bc - ad)^3 g^4 (a + bx)^2} - \frac{92bB^2 d^2}{88209(bc - ad)^4 g^4 (a + bx)} \\
&= -\frac{2bB^2}{264627(bc - ad)^2 g^4 (a + bx)^3} + \frac{7bB^2 d}{88209(bc - ad)^3 g^4 (a + bx)^2} - \frac{92bB^2 d^2}{88209(bc - ad)^4 g^4 (a + bx)} \\
&= -\frac{2bB^2}{264627(bc - ad)^2 g^4 (a + bx)^3} + \frac{7bB^2 d}{88209(bc - ad)^3 g^4 (a + bx)^2} - \frac{92bB^2 d^2}{88209(bc - ad)^4 g^4 (a + bx)}
\end{aligned}$$

**Mathematica [A]** time = 2.10637, size = 613, normalized size = 0.9

$$9B(18a^2b^2d^2(2Adx(c+dx)+Bc(c+2dx))+12a^3bd^3(A(c+dx)-Bdx)-3a^4Bd^4+6ab^3d(6Ad^2x^2(c+dx)+B(3c^2d$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2/((a\*g + b\*g\*x)^4\*(c\*i + d\*i\*x)^2), x]

[Out] 
$$\begin{aligned} & -(-27*(A^2 - 2*A*B + 2*B^2)*d^3*(-(b*c) + a*d)*(a + b*x)^3 + b*(9*A^2 + 6*A \\ & *B + 2*B^2)*(b*c - a*d)^3*(c + d*x) - 3*b*(9*A^2 + 12*A*B + 7*B^2)*d*(b*c - \\ & a*d)^2*(a + b*x)*(c + d*x) + 3*b*(27*A^2 + 78*A*B + 92*B^2)*d^2*(b*c - a*d \\ & )*(a + b*x)^2*(c + d*x) + 6*b*(18*A^2 + 30*A*B + 55*B^2)*d^3*(a + b*x)^3*(c \\ & + d*x)*\text{Log}[a + b*x] + 6*B*(b*c - a*d)*(9*(A - B)*d^3*(a + b*x)^3 + b*(3*A \\ & + B)*(b*c - a*d)^2*(c + d*x) - 3*b*(3*A + 2*B)*d*(b*c - a*d)*(a + b*x)*(c + \\ & d*x) + 3*b*(9*A + 13*B)*d^2*(a + b*x)^2*(c + d*x))*\text{Log}[(e*(a + b*x))/(c + \\ & d*x)] + 9*B*(-3*a^4*B*d^4 + 12*a^3*b*d^3*(-(B*d*x) + A*(c + d*x)) + 18*a^2* \\ & b^2*d^2*(2*A*d*x*(c + d*x) + B*c*(c + 2*d*x)) + 6*a*b^3*d*(6*A*d^2*x^2*(c + \\ & d*x) + B*(-c^3 + 3*c^2*d*x + 9*c*d^2*x^2 + 3*d^3*x^3)) + b^4*(12*A*d^3*x^3 \\ & *(c + d*x) + B*(c^4 - 2*c^3*d*x + 6*c^2*d^2*x^2 + 22*c*d^3*x^3 + 10*d^4*x^4 \\ & ))*\text{Log}[(e*(a + b*x))/(c + d*x)]^2 + 36*b*B^2*d^3*(a + b*x)^3*(c + d*x)*\text{Log} \\ & [(e*(a + b*x))/(c + d*x)]^3 - 6*b*(18*A^2 + 30*A*B + 55*B^2)*d^3*(a + b*x)^ \\ & 3*(c + d*x)*\text{Log}[c + d*x]/(27*(b*c - a*d)^5*g^4*i^2*(a + b*x)^3*(c + d*x)) \end{aligned}$$

**Maple [B]** time = 0.065, size = 4487, normalized size = 6.6

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^4/(d\*i\*x+c\*i)^2,x)

[Out] 
$$\begin{aligned} & -2*d^4/i^2/(a*d-b*c)^6/g^4*A*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*a+2*d^3/i^ \\ & 2/(a*d-b*c)^6/g^4*A*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*c+2/27*e^3*d/i^2/ \\ & (a*d-b*c)^6/g^4*B^2*b^4/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^3*a-1/3*e^3/i^2 \\ & / (a*d-b*c)^6/g^4*B^2*b^5/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^3*\ln(b*e/d+(a* \\ & d-b*c)*e/d/(d*x+c))^2*c-2/9*e^3/i^2/(a*d-b*c)^6/g^4*B^2*b^5/(b*e/d+e/(d*x+c \\ & ))*a-e/d/(d*x+c)*b*c)^3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+4*d^4/i^2/(a*d-b*c \\ & )^6/g^4*A*B*b*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a-4*d^3/i^2/(a*d-b*c)^6/g^4 \\ & *A*B*b^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-2*d^5/i^2/(a*d-b*c)^6/g^4*A*B* \end{aligned}$$

$$\begin{aligned}
& \ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*a^2-d^3/i^2/(a*d-b*c)^6/g^4*B^2*\ln( \\
& b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)*b^2*c^2+2*d^3/i^2/(a*d-b*c)^6/g^4*B^ \\
& 2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*b^2*c^2-2*d^5/i^2/(a*d-b*c)^6/g^4 \\
& *B^2/(d*x+c)*a^2-d^5/i^2/(a*d-b*c)^6/g^4*A^2/(d*x+c)*a^2+2*d^3/i^2/(a*d-b*c \\
& )^6/g^4*B^2*b^2*c-4/3*d^3/i^2/(a*d-b*c)^6/g^4*B^2*b^2*\ln(b*e/d+(a*d-b*c)*e/ \\
& d/(d*x+c))^3*c+4*d^4/i^2/(a*d-b*c)^6/g^4*A^2*b*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+ \\
& c))*a+4/3*d^4/i^2/(a*d-b*c)^6/g^4*B^2*b*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*a \\
& -d^5/i^2/(a*d-b*c)^6/g^4*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)*a^2+ \\
& d^3/i^2/(a*d-b*c)^6/g^4*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b^2*c+2*d^4/i \\
& ^2/(a*d-b*c)^6/g^4*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*a-2*d^3/i^2/(a*d-b \\
& *c)^6/g^4*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*c+2*d^5/i^2/(a*d-b*c)^6/g \\
& ^4*A*B/(d*x+c)*a^2-4*d^3/i^2/(a*d-b*c)^6/g^4*A^2*b^2*\ln(b*e/d+(a*d-b*c)*e/d \\
& /d/(d*x+c))*c+4*d^4/i^2/(a*d-b*c)^6/g^4*A*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/( \\
& d*x+c)*b*c*a+12*e*d^3/i^2/(a*d-b*c)^6/g^4*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d \\
& *x+c)*b*c)*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-12*e*d^2/i^2/(a*d-b*c)^6/g^4*A \\
& *B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))* \\
& c+2/3*e^3*d/i^2/(a*d-b*c)^6/g^4*A*B*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c) \\
& ^3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-4*e^2*d^2/i^2/(a*d-b*c)^6/g^4*A*B*b^3/ \\
& (b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+4*e \\
& ^2*d/i^2/(a*d-b*c)^6/g^4*A*B*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*\ln(b \\
& *e/d+(a*d-b*c)*e/d/(d*x+c))*c-2*d^3/i^2/(a*d-b*c)^6/g^4*A*B*b^2*c+d^3/i^2/( \\
& a*d-b*c)^6/g^4*A^2*b^2*c+2*d^4/i^2/(a*d-b*c)^6/g^4*B^2*\ln(b*e/d+(a*d-b*c)*e \\
& /d/(d*x+c))^2/(d*x+c)*b*c*a-4*d^4/i^2/(a*d-b*c)^6/g^4*B^2*\ln(b*e/d+(a*d-b*c \\
& )*e/d/(d*x+c))/(d*x+c)*b*c*a-2/3*e^3/i^2/(a*d-b*c)^6/g^4*A*B*b^5/(b*e/d+e/( \\
& d*x+c)*a-e/d/(d*x+c)*b*c)^3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-2*d^3/i^2/(a \\
& d-b*c)^6/g^4*A*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*b^2*c^2+6*e*d^3/i^ \\
& 2/(a*d-b*c)^6/g^4*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*\ln(b*e/d+(a*d \\
& -b*c)*e/d/(d*x+c))^2*a-6*e*d^2/i^2/(a*d-b*c)^6/g^4*B^2*b^3/(b*e/d+e/(d*x+c) \\
& *a-e/d/(d*x+c)*b*c)*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c+12*e*d^3/i^2/(a*d-b \\
& *c)^6/g^4*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*\ln(b*e/d+(a*d-b*c)*e/ \\
& d/(d*x+c))*a-2*e^2*d^2/i^2/(a*d-b*c)^6/g^4*A*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/( \\
& d*x+c)*b*c)^2*a+1/3*e^3*d/i^2/(a*d-b*c)^6/g^4*B^2*b^4/(b*e/d+e/(d*x+c)*a-e/ \\
& d/(d*x+c)*b*c)^3*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+2/9*e^3*d/i^2/(a*d-b*c \\
& )^6/g^4*B^2*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*\ln(b*e/d+(a*d-b*c)*e/ \\
& d/(d*x+c))*a-2*e^2*d^2/i^2/(a*d-b*c)^6/g^4*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/( \\
& d*x+c)*b*c)^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+2*e^2*d/i^2/(a*d-b*c)^6/g \\
& ^4*B^2*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*\ln(b*e/d+(a*d-b*c)*e/d/(d \\
& *x+c))^2*c-2*e^2*d^2/i^2/(a*d-b*c)^6/g^4*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x \\
& +c)*b*c)^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+2*e^2*d/i^2/(a*d-b*c)^6/g^4*B^ \\
& 2*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)) \\
& *c-2*d^4/i^2/(a*d-b*c)^6/g^4*B^2*b*a-d^4/i^2/(a*d-b*c)^6/g^4*A^2*b*a+2*d^3/ \\
& i^2/(a*d-b*c)^6/g^4*A*B/(d*x+c)*b^2*c^2-e^2*d^2/i^2/(a*d-b*c)^6/g^4*B^2*b^3 \\
& /b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a+e^2*d/i^2/(a*d-b*c)^6/g^4*B^2*b^4/ \\
& (b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c-2*e^2*d^2/i^2/(a*d-b*c)^6/g^4*A^2*b \\
& ^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a+2*e^2*d/i^2/(a*d-b*c)^6/g^4*A^2*
\end{aligned}$$

$$\begin{aligned}
& b^4/(b^e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^{2*c+1/3}e^3*d/i^2/(a*d-b*c)^6/g^4*A \\
& ^2*b^4/(b^e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a+12*e*d^3/i^2/(a*d-b*c)^6/g^4 \\
& *B^2*b^2/(b^e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-6*e*d^2/i^2/(a*d-b*c)^6/g^4* \\
& A^2*b^3/(b^e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c-12*e*d^2/i^2/(a*d-b*c)^6/g^4* \\
& B^2*b^3/(b^e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c+6*e*d^3/i^2/(a*d-b*c)^6/g^4*A \\
& ^2*b^2/(b^e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+2*d^4/i^2/(a*d-b*c)^6/g^4*A^2/ \\
& (d*x+c)*a*b*c-2/9*e^3/i^2/(a*d-b*c)^6/g^4*A*B*b^5/(b^e/d+e/(d*x+c)*a-e/d/(d \\
& *x+c)*b*c)^3*c+4*d^4/i^2/(a*d-b*c)^6/g^4*B^2/(d*x+c)*b*c*a+2*d^4/i^2/(a*d-b \\
& *c)^6/g^4*A*B*b*a-2*d^3/i^2/(a*d-b*c)^6/g^4*B^2/(d*x+c)*b^2*c^2-2/27*e^3/i^ \\
& 2/(a*d-b*c)^6/g^4*B^2*b^5/(b^e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*c+2*d^5/i^2 \\
& / (a*d-b*c)^6/g^4*B^2*\ln(b^e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)*a^2-4*d^4/i^2/ \\
& (a*d-b*c)^6/g^4*A*B/(d*x+c)*a*b*c-12*e*d^2/i^2/(a*d-b*c)^6/g^4*B^2*b^3/(b^e \\
& /d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*\ln(b^e/d+(a*d-b*c)*e/d/(d*x+c))*c+2*e^2*d/i \\
& ^2/(a*d-b*c)^6/g^4*A*B*b^4/(b^e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c+2/9*e^3* \\
& d/i^2/(a*d-b*c)^6/g^4*A*B*b^4/(b^e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a+12*e* \\
& d^3/i^2/(a*d-b*c)^6/g^4*A*B*b^2/(b^e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-12*e* \\
& d^2/i^2/(a*d-b*c)^6/g^4*A*B*b^3/(b^e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c-d^3/i \\
& ^2/(a*d-b*c)^6/g^4*A^2/(d*x+c)*b^2*c^2-d^4/i^2/(a*d-b*c)^6/g^4*B^2*\ln(b^e/d \\
& +(a*d-b*c)*e/d/(d*x+c))^2*b*a-1/3*e^3/i^2/(a*d-b*c)^6/g^4*A^2*b^5/(b^e/d+e/ \\
& (d*x+c)*a-e/d/(d*x+c)*b*c)^3*c
\end{aligned}$$

**Maxima [B]** time = 4.42911, size = 8316, normalized size = 12.19

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^4/(d\*i\*x+c\*i)^2,x, alg  
orithm="maxima")

[Out] 
$$\begin{aligned}
& -1/3*B^2*((12*b^3*d^3*x^3 + b^3*c^3 - 5*a*b^2*c^2*d + 13*a^2*b*c*d^2 + 3*a^ \\
& 3*d^3 + 6*(b^3*c*d^2 + 5*a*b^2*d^3)*x^2 - 2*(b^3*c^2*d - 8*a*b^2*c*d^2 - 11 \\
& *a^2*b*d^3)*x)/((b^7*c^4*d - 4*a*b^6*c^3*d^2 + 6*a^2*b^5*c^2*d^3 - 4*a^3*b^ \\
& 4*c*d^4 + a^4*b^3*d^5)*g^4*i^2*x^4 + (b^7*c^5 - a*b^6*c^4*d - 6*a^2*b^5*c^3 \\
& *d^2 + 14*a^3*b^4*c^2*d^3 - 11*a^4*b^3*c*d^4 + 3*a^5*b^2*d^5)*g^4*i^2*x^3 + \\
& 3*(a*b^6*c^5 - 3*a^2*b^5*c^4*d + 2*a^3*b^4*c^3*d^2 + 2*a^4*b^3*c^2*d^3 - 3 \\
& *a^5*b^2*c*d^4 + a^6*b*d^5)*g^4*i^2*x^2 + (3*a^2*b^5*c^5 - 11*a^3*b^4*c^4*d \\
& + 14*a^4*b^3*c^3*d^2 - 6*a^5*b^2*c^2*d^3 - a^6*b*c*d^4 + a^7*d^5)*g^4*i^2* \\
& x + (a^3*b^4*c^5 - 4*a^4*b^3*c^4*d + 6*a^5*b^2*c^3*d^2 - 4*a^6*b*c^2*d^3 + \\
& a^7*c*d^4)*g^4*i^2) + 12*b*d^3*log(b*x + a)/((b^5*c^5 - 5*a*b^4*c^4*d + 10* \\
& a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^4*i^2) - \\
& 12*b*d^3*log(d*x + c)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a
\end{aligned}$$

$$\begin{aligned}
& ^3b^2c^2d^3 + 5a^4b^3cd^4 - a^5d^5)g^4i^2))\log(bex/(dx + c) + a \\
& *e/(dx + c))^2 - 2/3A*B*((12b^3d^3x^3 + b^3c^3 - 5ab^2c^2d + 13a \\
& ^2b^3cd^2 + 3a^3d^3 + 6*(b^3cd^2 + 5ab^2d^3)*x^2 - 2*(b^3c^2d - 8 \\
& *ab^2cd^2 - 11a^2bd^3)*x)/((b^7c^4d - 4ab^6c^3d^2 + 6a^2b^5c \\
& ^2d^3 - 4a^3b^4cd^4 + a^4b^3d^5)g^4i^2*x^4 + (b^7c^5 - ab^6c^4d \\
& - 6a^2b^5c^3d^2 + 14a^3b^4c^2d^3 - 11a^4b^3cd^4 + 3a^5b^2d \\
& ^5)g^4i^2*x^3 + 3*(ab^6c^5 - 3a^2b^5c^4d + 2a^3b^4c^3d^2 + 2a^ \\
& 4b^3c^2d^3 - 3a^5b^2cd^4 + a^6b^3d^5)g^4i^2*x^2 + (3a^2b^5c^5 - \\
& 11a^3b^4c^4d + 14a^4b^3c^3d^2 - 6a^5b^2c^2d^3 - a^6b^3cd^4 + \\
& a^7d^5)g^4i^2*x + (a^3b^4c^5 - 4a^4b^3c^4d + 6a^5b^2c^3d^2 - 4 \\
& *a^6b^3cd^3 + a^7cd^4)g^4i^2) + 12b^3d^3\log(bx + a)/((b^5c^5 - 5 \\
& *ab^4c^4d + 10a^2b^3c^3d^2 - 10a^3b^2c^2d^3 + 5a^4b^3cd^4 - a^5 \\
& *d^5)g^4i^2) - 12b^3d^3\log(dx + c)/((b^5c^5 - 5ab^4c^4d + 10a^2b \\
& ^3c^3d^2 - 10a^3b^2c^2d^3 + 5a^4b^3cd^4 - a^5d^5)g^4i^2))\log(b \\
& ex/(dx + c) + ae/(dx + c)) - 1/27B^2*(6*(b^4c^4 - 9ab^3c^3d + 54 \\
& a^2b^2c^2d^2 - 55a^3b^3cd^3 + 9a^4d^4 + 30*(b^4cd^3 - ab^3d^4)*x \\
& ^3 + 3*(11b^4c^2d^2 + 8ab^3cd^3 - 19a^2b^2d^4)*x^2 - 18*(b^4d^4 \\
& x^4 + a^3b^3cd^3 + (b^4cd^3 + 3ab^3d^4)*x^3 + 3*(ab^3cd^3 + a^2b^ \\
& 2d^4)*x^2 + (3a^2b^2cd^3 + a^3bd^4)*x)\log(bx + a)^2 - 18*(b^4d^4 \\
& x^4 + a^3b^3cd^3 + (b^4cd^3 + 3ab^3d^4)*x^3 + 3*(ab^3cd^3 + a^2b^ \\
& 2d^4)*x^2 + (3a^2b^2cd^3 + a^3bd^4)*x)\log(dx + c)^2 - (5b^4c^3d \\
& - 81ab^3c^2d^2 + 57a^2b^2cd^3 + 19a^3bd^4)*x + 30*(b^4d^4x^4 \\
& + a^3b^3cd^3 + (b^4cd^3 + 3ab^3d^4)*x^3 + 3*(ab^3cd^3 + a^2b^2d^ \\
& 4)*x^2 + (3a^2b^2cd^3 + a^3bd^4)*x)\log(bx + a) - 6*(5b^4d^4x^4 + \\
& 5a^3b^3cd^3 + 5*(b^4cd^3 + 3ab^3d^4)*x^3 + 15*(ab^3cd^3 + a^2b^ \\
& 2d^4)*x^2 + 5*(3a^2b^2cd^3 + a^3bd^4)*x - 6*(b^4d^4x^4 + a^3b^3cd \\
& ^3 + (b^4cd^3 + 3ab^3d^4)*x^3 + 3*(ab^3cd^3 + a^2b^2d^4)*x^2 + (3 \\
& *a^2b^2cd^3 + a^3bd^4)*x)\log(bx + a))\log(dx + c))\log(bex/(dx + \\
& c) + ae/(dx + c))/(a^3b^5c^6g^4i^2 - 5a^4b^4c^5d^2g^4i^2 + 10a^ \\
& 5b^3c^4d^2g^4i^2 - 10a^6b^2c^3d^3g^4i^2 + 5a^7b^3c^2d^4g^4i^ \\
& 2 - a^8cd^5g^4i^2 + (b^8c^5d^2g^4i^2 - 5ab^7c^4d^2g^4i^2 + 10a \\
& ^2b^6c^3d^3g^4i^2 - 10a^3b^5c^2d^4g^4i^2 + 5a^4b^4c^5d^5g^4i \\
& ^2 - a^5b^3d^6g^4i^2)*x^4 + (b^8c^6g^4i^2 - 2ab^7c^5d^2g^4i^2 - \\
& 5a^2b^6c^4d^2g^4i^2 + 20a^3b^5c^3d^3g^4i^2 - 25a^4b^4c^2d^4 \\
& *g^4i^2 + 14a^5b^3cd^5g^4i^2 - 3a^6b^2d^6g^4i^2)*x^3 + 3*(ab^7 \\
& *c^6g^4i^2 - 4a^2b^6c^5d^2g^4i^2 + 5a^3b^5c^4d^2g^4i^2 - 5a^5 \\
& b^3c^2d^4g^4i^2 + 4a^6b^2cd^5g^4i^2 - a^7bd^6g^4i^2)*x^2 + (3 \\
& *a^2b^6c^6g^4i^2 - 14a^3b^5c^5d^2g^4i^2 + 25a^4b^4c^4d^2g^4i^ \\
& 2 - 20a^5b^3c^3d^3g^4i^2 + 5a^6b^2c^2d^4g^4i^2 + 2a^7b^3cd^5 \\
& g^4i^2 - a^8d^6g^4i^2)*x) + (2b^4c^4 - 27ab^3c^3d + 324a^2b^2c \\
& ^2d^2 - 245a^3b^3cd^3 - 54a^4d^4 + 330*(b^4cd^3 - ab^3d^4)*x^3 + 3 \\
& 6*(b^4d^4x^4 + a^3b^3cd^3 + (b^4cd^3 + 3ab^3d^4)*x^3 + 3*(ab^3cd \\
& ^3 + a^2b^2d^4)*x^2 + (3a^2b^2cd^3 + a^3bd^4)*x)\log(bx + a)^3 - 3 \\
& 6*(b^4d^4x^4 + a^3b^3cd^3 + (b^4cd^3 + 3ab^3d^4)*x^3 + 3*(ab^3cd \\
& ^3 + a^2b^2d^4)*x^2 + (3a^2b^2cd^3 + a^3bd^4)*x)\log(dx + c)^3 + 1
\end{aligned}$$



$$\begin{aligned}
&5*(17*b^4*c^2*d^2 + 32*a*b^3*c*d^3 - 49*a^2*b^2*d^4)*x^2 - 90*(b^4*d^4*x^4 \\
&+ a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*\log(b*x + a)^2 - 18*(5*b^4*d^4*x^4 \\
&+ 5*a^3*b*c*d^3 + 5*(b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 15*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 5*(3*a^2*b^2*c*d^3 + a^3*b*d^4)*x - 6*(b^4*d^4*x^4 + a^3*b*c*d^3 \\
&+ (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*\log(b*x + a))*\log(d*x + c)^2 - (19*b^4*c^3*d \\
&- 567*a*b^3*c^2*d^2 + 87*a^2*b^2*c*d^3 + 461*a^3*b*d^4)*x + 330*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 \\
&+ (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*\log(b*x + a) - 6*(55*b^4*d^4*x^4 + 55*a^3*b*c*d^3 + 55*(b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 165*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 \\
&+ 18*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*\log(b*x + a)^2 + 55*(3*a^2*b^2*c*d^3 + a^3*b*d^4)*x \\
&- 30*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*\log(b*x + a))*\log(d*x + c))/(a^3 \\
&*b^5*c^6*g^4*i^2 - 5*a^4*b^4*c^5*d*g^4*i^2 + 10*a^5*b^3*c^4*d^2*g^4*i^2 - 10*a^6*b^2*c^3*d^3*g^4*i^2 + 5*a^7*b*c^2*d^4*g^4*i^2 - a^8*c*d^5*g^4*i^2 + ( \\
&b^8*c^5*d*g^4*i^2 - 5*a*b^7*c^4*d^2*g^4*i^2 + 10*a^2*b^6*c^3*d^3*g^4*i^2 - 10*a^3*b^5*c^2*d^4*g^4*i^2 + 5*a^4*b^4*c*d^5*g^4*i^2 - a^5*b^3*d^6*g^4*i^2) \\
&*x^4 + (b^8*c^6*g^4*i^2 - 2*a*b^7*c^5*d*g^4*i^2 - 5*a^2*b^6*c^4*d^2*g^4*i^2 + 20*a^3*b^5*c^3*d^3*g^4*i^2 - 25*a^4*b^4*c^2*d^4*g^4*i^2 + 14*a^5*b^3*c*d^5*g^4*i^2 - 3*a^6*b^2*d^6*g^4*i^2) \\
&)*x^3 + 3*(a*b^7*c^6*g^4*i^2 - 4*a^2*b^6*c^5*d*g^4*i^2 + 5*a^3*b^5*c^4*d^2*g^4*i^2 - 5*a^5*b^3*c^2*d^4*g^4*i^2 + 4*a^6*b^2*c*d^5*g^4*i^2 - a^7*b*d^6*g^4*i^2)*x^2 + (3*a^2*b^6*c^6*g^4*i^2 - 14 \\
&*a^3*b^5*c^5*d*g^4*i^2 + 25*a^4*b^4*c^4*d^2*g^4*i^2 - 20*a^5*b^3*c^3*d^3*g^4*i^2 + 5*a^6*b^2*c^2*d^4*g^4*i^2 + 2*a^7*b*c*d^5*g^4*i^2 - a^8*d^6*g^4*i^2) \\
&)*x)) - 1/3*A^2*((12*b^3*d^3*x^3 + b^3*c^3 - 5*a*b^2*c^2*d + 13*a^2*b*c*d^2 + 3*a^3*d^3 + 6*(b^3*c*d^2 + 5*a*b^2*d^3)*x^2 - 2*(b^3*c^2*d - 8*a*b^2*c*d^2 \\
&- 11*a^2*b*d^3)*x)/((b^7*c^4*d - 4*a*b^6*c^3*d^2 + 6*a^2*b^5*c^2*d^3 - 4*a^3*b^4*c*d^4 + a^4*b^3*d^5)*g^4*i^2*x^4 + (b^7*c^5 - a*b^6*c^4*d - 6*a^2*b^5*c^3*d^2 + 14*a^3*b^4*c^2*d^3 - 11*a^4*b^3*c*d^4 + 3*a^5*b^2*d^5)*g^4*i^2 \\
&2*x^3 + 3*(a*b^6*c^5 - 3*a^2*b^5*c^4*d + 2*a^3*b^4*c^3*d^2 + 2*a^4*b^3*c^2*d^3 - 3*a^5*b^2*c*d^4 + a^6*b*d^5)*g^4*i^2*x^2 + (3*a^2*b^5*c^5 - 11*a^3*b^4*c^4*d + 14*a^4*b^3*c^3*d^2 - 6*a^5*b^2*c^2*d^3 - a^6*b*c*d^4 + a^7*d^5)*g^4 \\
&4*i^2*x + (a^3*b^4*c^5 - 4*a^4*b^3*c^4*d + 6*a^5*b^2*c^3*d^2 - 4*a^6*b*c^2*d^3 + a^7*c*d^4)*g^4*i^2) + 12*b*d^3*\log(b*x + a)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^4*i^2) \\
&- 12*b*d^3*\log(d*x + c)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^4*i^2) - 2/9*(b^4*c^4 - 9*a*b^3*c^3*d + 54*a^2*b^2*c^2*d^2 - 55*a^3*b*c*d^3 + 9*a^4*d^4 + 30*(b^4*c*d^3 - a*b^3*d^4)*x^3 + 3*(11*b^4*c^2*d^2 + 8*a*b^3*c*d^3 - 19*a^2*b^2*d^4) \\
&)*x^2 - 18*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*\log(b*x + a)^2 - 18*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(
\end{aligned}$$

$$\begin{aligned}
& a^3 b^3 c^3 d^3 + a^2 b^2 d^4) x^2 + (3 a^2 b^2 c^3 d^3 + a^3 b^3 d^4) x) \log(d x + c)^2 - (5 b^4 c^3 d - 81 a b^3 c^2 d^2 + 57 a^2 b^2 c^3 d^3 + 19 a^3 b^3 d^4) x \\
& + 30 (b^4 d^4 x^4 + a^3 b^3 c^3 d^3 + (b^4 c^3 d^3 + 3 a^2 b^3 d^4) x^3 + 3 (a^2 b^3 c^3 d^3 + a^2 b^2 d^4) x^2 + (3 a^2 b^2 c^3 d^3 + a^3 b^3 d^4) x) \log(b x + a) \\
& - 6 (5 b^4 d^4 x^4 + 5 a^3 b^3 c^3 d^3 + 5 (b^4 c^3 d^3 + 3 a^2 b^3 d^4) x^3 + 15 (a^2 b^3 c^3 d^3 + a^2 b^2 d^4) x^2 + 5 (3 a^2 b^2 c^3 d^3 + a^3 b^3 d^4) x - 6 (b^4 d^4 x^4 + a^3 b^3 c^3 d^3 + (b^4 c^3 d^3 + 3 a^2 b^3 d^4) x^3 + 3 (a^2 b^3 c^3 d^3 + a^2 b^2 d^4) x^2 + (3 a^2 b^2 c^3 d^3 + a^3 b^3 d^4) x) \log(b x + a)) \log(d x + c)) * A * B / (a^3 b^5 c^6 g^4 i^2 - 5 a^4 b^4 c^5 d g^4 i^2 + 10 a^5 b^3 c^4 d^2 g^4 i^2 - 10 a^6 b^2 c^3 d^3 g^4 i^2 + 5 a^7 b^2 c^2 d^4 g^4 i^2 - a^8 c^2 d^5 g^4 i^2 + (b^8 c^5 d g^4 i^2 - 5 a b^7 c^4 d^2 g^4 i^2 + 10 a^2 b^6 c^3 d^3 g^4 i^2 - 10 a^3 b^5 c^2 d^4 g^4 i^2 + 5 a^4 b^4 c^2 d^5 g^4 i^2 - a^5 b^3 c^2 d^6 g^4 i^2) x^4 + (b^8 c^6 g^4 i^2 - 2 a b^7 c^5 d g^4 i^2 - 5 a^2 b^6 c^4 d^2 g^4 i^2 + 20 a^3 b^5 c^3 d^3 g^4 i^2 - 25 a^4 b^4 c^2 d^4 g^4 i^2 + 14 a^5 b^3 c^2 d^5 g^4 i^2 - 3 a^6 b^2 d^6 g^4 i^2) x^3 + 3 (a^7 b^2 c^6 g^4 i^2 - 4 a^2 b^6 c^5 d g^4 i^2 + 5 a^3 b^5 c^4 d^2 g^4 i^2 - 5 a^5 b^3 c^2 d^4 g^4 i^2 + 4 a^6 b^2 c^2 d^5 g^4 i^2 - a^7 b^2 d^6 g^4 i^2) x^2 + (3 a^2 b^6 c^6 g^4 i^2 - 14 a^3 b^5 c^5 d g^4 i^2 + 25 a^4 b^4 c^4 d^2 g^4 i^2 - 20 a^5 b^3 c^3 d^3 g^4 i^2 + 5 a^6 b^2 c^2 d^4 g^4 i^2 + 2 a^7 b^2 c^2 d^5 g^4 i^2 - a^8 d^6 g^4 i^2) x)
\end{aligned}$$


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**Fricas [B]** time = 0.694092, size = 3193, normalized size = 4.68

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^4/(d\*i\*x+c\*i)^2,x, algorithm="fricas")

[Out]  $-1/27 * ((9A^2 + 6AB + 2B^2) b^4 c^4 - 27(2A^2 + 2AB + B^2) a^3 b^3 c^3 d + 162(A^2 + 2AB + 2B^2) a^2 b^2 c^2 d^2 - 5(18A^2 + 66AB + 49B^2) a^3 b^3 c^3 d^3 - 27(A^2 - 2AB + 2B^2) a^4 d^4 + 6((18A^2 + 30AB + 55B^2) b^4 c^3 d^3 - (18A^2 + 30AB + 55B^2) a^2 b^3 d^4) x^3 + 36(B^2 b^4 d^4 x^4 + B^2 a^3 b^3 c^3 d^3 + (B^2 b^4 c^3 d^3 + 3B^2 a^2 b^3 d^4) x^3 + 3(B^2 a^2 b^3 c^3 d^3 + B^2 a^2 b^2 d^4) x^2 + (3B^2 a^2 b^2 c^3 d^3 + B^2 a^3 b^3 d^4) x) \log((b e x + a e) / (d x + c))^3 + 3((18A^2 + 66AB + 85B^2) b^4 c^2 d^2 + 8(9A^2 + 6AB + 20B^2) a^2 b^3 c^3 d^3 - (90A^2 + 114AB + 245B^2) a^2 b^2 d^4) x^2 + 9(2(6AB + 5B^2) b^4 d^4 x^4 + B^2 b^4 c^4 - 6B^2 a^2 b^3 c^3 d + 18B^2 a^2 b^2 c^2 d^2 + 12AB a^3 b^3 c^3 d^3 - 3B^2 a^4 d^4 + 2((6AB + 11B^2) b^4 c^3 d^3 + 9(2AB + B^2) a^2 b^3 d^4) x^3 + 6(B^2 b^4 c^2 d^2 + 6AB a^2 b^2 d^4 + 3(2AB + 3B^2) a^2 b^3 c^3 d^3) x^2 - 2(B^2$

$$\begin{aligned}
& b^4 c^3 d - 9 B^2 a b^3 c^2 d^2 - 18 (A B + B^2) a^2 b^2 c d^3 - 6 (A B - B^2) a^3 b d^4) x) \log((b e x + a e) / (d x + c))^2 - ((18 A^2 + 30 A B + 19 B^2) b^4 c^3 d - 81 (2 A^2 + 6 A B + 7 B^2) a b^3 c^2 d^2 - 3 (18 A^2 - 114 A B - 29 B^2) a^2 b^2 c d^3 + (198 A^2 + 114 A B + 461 B^2) a^3 b d^4) x + 6 ((18 A^2 + 30 A B + 55 B^2) b^4 d^4 x^4 + 18 A^2 a^3 b c d^3 + (3 A B + B^2) b^4 c^4 - 9 (2 A B + B^2) a b^3 c^3 d + 54 (A B + B^2) a^2 b^2 c^2 d^2 - 9 (A B - B^2) a^4 d^4 + ((18 A^2 + 66 A B + 85 B^2) b^4 c d^3 + 27 (2 A^2 + 2 A B + 5 B^2) a b^3 d^4) x^3 + 3 ((6 A B + 11 B^2) b^4 c^2 d^2 + 9 (2 A^2 + 6 A B + 7 B^2) a b^3 c d^3 + 18 (A^2 + 2 B^2) a^2 b^2 d^4) x^2 - ((6 A B + 5 B^2) b^4 c^3 d - 27 (2 A B + 3 B^2) a b^3 c^2 d^2 - 54 (A^2 + 2 A B + 2 B^2) a^2 b^2 c d^3 - 18 (A^2 - 2 A B + 2 B^2) a^3 b d^4) x) \log((b e x + a e) / (d x + c)) / ((b^8 c^5 d - 5 a b^7 c^4 d^2 + 10 a^2 b^6 c^3 d^3 - 10 a^3 b^5 c^2 d^4 + 5 a^4 b^4 c d^5 - a^5 b^3 d^6) g^4 i^2 x^4 + (b^8 c^6 - 2 a b^7 c^5 d - 5 a^2 b^6 c^4 d^2 + 20 a^3 b^5 c^3 d^3 - 25 a^4 b^4 c^2 d^4 + 14 a^5 b^3 c d^5 - 3 a^6 b^2 d^6) g^4 i^2 x^3 + 3 (a b^7 c^6 - 4 a^2 b^6 c^5 d + 5 a^3 b^5 c^4 d^2 - 5 a^4 b^3 c^2 d^4 + 4 a^6 b^2 c d^5 - a^7 b d^6) g^4 i^2 x^2 + (3 a^2 b^6 c^6 - 14 a^3 b^5 c^5 d + 25 a^4 b^4 c^4 d^2 - 20 a^5 b^3 c^3 d^3 + 5 a^6 b^2 c^2 d^4 + 2 a^7 b c d^5 - a^8 d^6) g^4 i^2 x + (a^3 b^5 c^6 - 5 a^4 b^4 c^5 d + 10 a^5 b^3 c^4 d^2 - 10 a^6 b^2 c^3 d^3 + 5 a^7 b c^2 d^4 - a^8 c d^5) g^4 i^2)
\end{aligned}$$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*(b\*x+a)/(d\*x+c)))\*\*2/(b\*g\*x+a\*g)\*\*4/(d\*i\*x+c\*i)\*\*2,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left( B \log\left(\frac{bx+a}{dx+c}\right) + A \right)^2}{(bgx + ag)^4 (dix + ci)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x, alg  
orithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/((b*g*x + a*g)^4*(d*i*x + c*  
i)^2), x)
```

$$3.100 \quad \int \frac{(ag+bgx)^3 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)^2}{(ci+dx)^3} dx$$

**Optimal.** Leaf size=635

$$\frac{6b^2Bg^3(bc-ad)\text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{d^4i^3} + \frac{2b^2B^2g^3(bc-ad)\text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)}{d^4i^3} - \frac{6b^2B^2g^3(bc-ad)}{d^4i^3}$$

```
[Out] (B^2*(b*c - a*d)*g^3*(a + b*x)^2)/(4*d^2*i^3*(c + d*x)^2) - (4*A*b*B*(b*c - a*d)*g^3*(a + b*x))/(d^3*i^3*(c + d*x)) + (4*b*B^2*(b*c - a*d)*g^3*(a + b*x))/(d^3*i^3*(c + d*x)) - (4*b*B^2*(b*c - a*d)*g^3*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)]/(d^3*i^3*(c + d*x)) - (B*(b*c - a*d)*g^3*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])/(2*d^2*i^3*(c + d*x)^2) + (2*b^2*B*(b*c - a*d)*g^3*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^4*i^3) + (b^2*g^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2)/(d^3*i^3) + ((b*c - a*d)*g^3*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2)/(2*d^2*i^3*(c + d*x)^2) + (2*b*(b*c - a*d)*g^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2)/(d^3*i^3*(c + d*x)) + (3*b^2*(b*c - a*d)*g^3*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2)/(d^4*i^3) + (2*b^2*B^2*(b*c - a*d)*g^3*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i^3) + (6*b^2*B*(b*c - a*d)*g^3*(A + B*Log[(e*(a + b*x))/(c + d*x]])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i^3) - (6*b^2*B^2*(b*c - a*d)*g^3*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i^3)
```

**Rubi [B]** time = 6.24144, antiderivative size = 1890, normalized size of antiderivative = 2.98, number of steps used = 124, number of rules used = 26, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.619$ , Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 44, 6688, 6742, 2500, 2433, 2375, 2317, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2)/(c*i + d*i*x)^3, x]
```

```
[Out] (B^2*(b*c - a*d)^3*g^3)/(4*d^4*i^3*(c + d*x)^2) - (9*b*B^2*(b*c - a*d)^2*g^3)/(2*d^4*i^3*(c + d*x)) - (9*b^2*B^2*(b*c - a*d)*g^3*Log[a + b*x])/(2*d^4*i^3) - (a*b^2*B^2*g^3*Log[a + b*x]^2)/(d^3*i^3) - (5*b^2*B^2*(b*c - a*d)*g^3*Log[a + b*x]^2)/(2*d^4*i^3) + (3*b^2*B^2*(b*c - a*d)*g^3*Log[a + b*x]*Log
```

$$\begin{aligned}
& [(c + d*x)^{-1}]^2/(d^4*i^3) - (3*b^2*B^2*(b*c - a*d)*g^3*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[(c + d*x)^{-1}]^2/(d^4*i^3) - (B*(b*c - a*d)^3*g^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(2*d^4*i^3*(c + d*x)^2) + (5*b*B*(b*c - a*d)^2*g^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(d^4*i^3*(c + d*x)) + (2*a*b^2*B*g^3*\text{Log}[a + b*x]*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(d^3*i^3) + (5*b^2*B*(b*c - a*d)*g^3*\text{Log}[a + b*x]*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(d^4*i^3) + (b^3*g^3*x*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]^2)/(d^3*i^3) + ((b*c - a*d)^3*g^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]^2)/(2*d^4*i^3*(c + d*x)^2) - (3*b*(b*c - a*d)^2*g^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]^2)/(d^4*i^3*(c + d*x)) + (9*b^2*B^2*(b*c - a*d)*g^3*\text{Log}[c + d*x])/(2*d^4*i^3) + (3*b^2*B^2*(b*c - a*d)*g^3*\text{Log}[a + b*x]^2*\text{Log}[c + d*x])/(d^4*i^3) + (2*b^3*B^2*c*g^3*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/(d^4*i^3) + (6*A*b^2*B*(b*c - a*d)*g^3*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/(d^4*i^3) + (5*b^2*B^2*(b*c - a*d)*g^3*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/(d^4*i^3) + (6*b^2*B^2*(b*c - a*d)*g^3*\text{Log}[a + b*x]*\text{Log}[(c + d*x)^{-1}]*\text{Log}[c + d*x])/(d^4*i^3) - (6*b^2*B^2*(b*c - a*d)*g^3*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[(c + d*x)]*(\text{Log}[a + b*x] + \text{Log}[(c + d*x)^{-1}] - \text{Log}[(e*(a + b*x))/(c + d*x]))*\text{Log}[c + d*x])/(d^4*i^3) - (2*b^3*B*c*g^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])*\text{Log}[c + d*x])/(d^4*i^3) - (5*b^2*B*(b*c - a*d)*g^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)])*\text{Log}[c + d*x])/(d^4*i^3) - (3*b^2*(b*c - a*d)*g^3*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]^2*\text{Log}[c + d*x])/(d^4*i^3) - (b^3*B^2*c*g^3*\text{Log}[c + d*x]^2)/(d^4*i^3) - (3*A*b^2*B*(b*c - a*d)*g^3*\text{Log}[c + d*x]^2)/(d^4*i^3) - (5*b^2*B^2*(b*c - a*d)*g^3*\text{Log}[c + d*x]^2)/(2*d^4*i^3) + (3*b^2*B^2*(b*c - a*d)*g^3*\text{Log}[a + b*x]*\text{Log}[c + d*x]^2)/(d^4*i^3) - (3*b^2*B^2*(b*c - a*d)*g^3*\text{Log}[(e*(a + b*x))/(c + d*x)]*\text{Log}[c + d*x]^2)/(d^4*i^3) - (b^2*B^2*(b*c - a*d)*g^3*\text{Log}[c + d*x]^3)/(d^4*i^3) + (2*a*b^2*B^2*g^3*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)]/(d^3*i^3) + (5*b^2*B^2*(b*c - a*d)*g^3*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)]/(d^4*i^3) - (3*b^2*B^2*(b*c - a*d)*g^3*\text{Log}[a + b*x]^2*\text{Log}[(b*(c + d*x))/(b*c - a*d)]/(d^4*i^3) + (2*a*b^2*B^2*g^3*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]/(d^3*i^3) + (5*b^2*B^2*(b*c - a*d)*g^3*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]/(d^4*i^3) - (6*b^2*B^2*(b*c - a*d)*g^3*\text{Log}[a + b*x]*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]/(d^4*i^3) + (2*b^3*B^2*c*g^3*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]/(d^4*i^3) + (6*A*b^2*B*(b*c - a*d)*g^3*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]/(d^4*i^3) + (5*b^2*B^2*(b*c - a*d)*g^3*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]/(d^4*i^3) + (6*b^2*B^2*(b*c - a*d)*g^3*\text{Log}[(c + d*x)^{-1}]*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]/(d^4*i^3) - (6*b^2*B^2*(b*c - a*d)*g^3*(\text{Log}[a + b*x] + \text{Log}[(c + d*x)^{-1}] - \text{Log}[(e*(a + b*x))/(c + d*x]))*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]/(d^4*i^3) + (6*b^2*B^2*(b*c - a*d)*g^3*\text{PolyLog}[3, -((d*(a + b*x))/(b*c - a*d))]/(d^4*i^3) + (6*b^2*B^2*(b*c - a*d)*g^3*\text{PolyLog}[3, (b*(c + d*x))/(b*c - a*d)]/(d^4*i^3)
\end{aligned}$$

### Rule 2528

$\text{Int}[(a_.) + \text{Log}[(c_.)*(Rfx_)^{(p_.)}]*(b_.)^{(n_.)}*(RGx_), x\_Symbol] \text{ :> With}$

```
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] := Simp[x*(a + b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_) /; FreeQ[b, x]]
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

### Rule 6688

```
Int[u_, x_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifyIntegrandQ[v, u, x]]
```

### Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]
```

### Rule 2500



```

Int[(Log[(e_.)*((f_.)*(a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^((r_.))*((s_.) + Log[(i_.)*(g_.) + (h_.)*(x_)]^(n_.))*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] := Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]

```

### Rule 2433

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] := Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]

```

### Rule 2375

```

Int[(Log[(d_.)*((e_) + (f_.)*(x_))^(m_.))]^(r_.)*((a_.) + Log[(c_.)*(x_)]^(n
_.))*((b_.))^(p_.))/(x_), x_Symbol] := Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]

```

### Rule 2317

```

Int[((a_.) + Log[(c_.)*(x_)]^(n_.))*((b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] := Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]

```

### Rule 2374

```

Int[(Log[(d_.)*((e_) + (f_.)*(x_))^(m_.))]*((a_.) + Log[(c_.)*(x_)]^(n_.))*((b
_.))^(p_.))/(x_), x_Symbol] := -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]

```

### Rule 6589

```

Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d

```

, e, n, p}, x] && EqQ[b\*d, a\*e]

### Rule 2440

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))\*((f\_.) + Log[(h\_.) \*((i\_.) + (j\_.)\*(x\_))^(m\_.)]\*(g\_.))\*((k\_) + (l\_.)\*(x\_))^(r\_.), x\_Symbol] :> Dist[1/l, Subst[Int[x^r\*(a + b\*Log[c\*(-((e\*k - d\*l)/l) + (e\*x)/l)^n])\*(f + g\*Log[h\*(-((j\*k - i\*l)/l) + (j\*x)/l)^m]), x], x, k + l\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]

### Rule 2434

Int[(((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))\*((f\_.) + Log[(h\_.) \*((i\_.) + (j\_.)\*(x\_))^(m\_.)]\*(g\_.)))/(x\_), x\_Symbol] :> Simp[Log[x]\*(a + b\*Log[c\*(d + e\*x)^n])\*(f + g\*Log[h\*(i + j\*x)^m]), x] + (-Dist[e\*g\*m, Int[(Log[x]\*g\*(a + b\*Log[c\*(d + e\*x)^n])]/(d + e\*x), x], x] - Dist[b\*j\*n, Int[(Log[x]\*f + g\*Log[h\*(i + j\*x)^m])]/(i + j\*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, m, n}, x] && EqQ[e\*i - d\*j, 0]

### Rule 2499

Int[(Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.) )^(r\_.)]\*(((s\_.) + Log[(i\_.)\*((g\_.) + (h\_.)\*(x\_))^(n\_.)]\*(t\_.))^(m\_.))/((j\_.) + (k\_.)\*(x\_)), x\_Symbol] :> Simp[((s + t\*Log[i\*(g + h\*x)^n])^(m + 1)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r)/(k\*n\*t\*(m + 1)), x] + (-Dist[(b\*p\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(a + b\*x), x], x] - Dist[(d\*q\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(c + d\*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0] && EqQ[h\*j - g\*k, 0] && IGtQ[m, 0]

### Rule 2396

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_)/((f\_.) + (g\_.) \* (x\_)), x\_Symbol] :> Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])^p)/g, x] - Dist[(b\*e\*n\*p)/g, Int[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])^(p - 1))/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p}, x] && NeQ[e\*f - d\*g, 0] && IGtQ[p, 1]

### Rule 2302

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_)/(x\_), x\_Symbol] :> Dist[1/(b\*n), Subst[Int[x^p, x], x, a + b\*Log[c\*x^n]], x] /; FreeQ[{a, b, c, n, p}, x]

Rule 30

`Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && NeQ[m, -1]`

Rubi steps

$$\begin{aligned}
\int \frac{(ag + bgx)^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(100c + 100dx)^3} dx &= \int \left( \frac{b^3 g^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{1000000d^3} + \frac{(-bc + ad)^3 g^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{1000000d^3(c + dx)^3} + \frac{3b(bc - ad)^3 g^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{2000000d^4(c + dx)^2} \right) dx \\
&= \frac{(b^3 g^3) \int \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{1000000d^3} - \frac{(3b^2(bc - ad)g^3) \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{c+dx}}{1000000d^3} + \frac{3b(bc - ad)^3 g^3 \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{(c + dx)^2}}{2000000d^4} \\
&= \frac{b^3 g^3 x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{1000000d^3} + \frac{(bc - ad)^3 g^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{2000000d^4(c + dx)^2} - \frac{3b(bc - ad)^3 g^3 \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{c+dx}}{2000000d^4} \\
&= \frac{b^3 g^3 x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{1000000d^3} + \frac{(bc - ad)^3 g^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{2000000d^4(c + dx)^2} - \frac{3b(bc - ad)^3 g^3 \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{c+dx}}{2000000d^4} \\
&= \frac{b^3 g^3 x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{1000000d^3} + \frac{(bc - ad)^3 g^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{2000000d^4(c + dx)^2} - \frac{3b(bc - ad)^3 g^3 \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{c+dx}}{2000000d^4} \\
&= \frac{b^3 g^3 x \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{1000000d^3} + \frac{(bc - ad)^3 g^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{2000000d^4(c + dx)^2} - \frac{3b(bc - ad)^3 g^3 \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2 dx}{c+dx}}{2000000d^4} \\
&= -\frac{B(bc - ad)^3 g^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{2000000d^4(c + dx)^2} + \frac{bB(bc - ad)^2 g^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{200000d^4(c + dx)} \\
&= -\frac{B(bc - ad)^3 g^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{2000000d^4(c + dx)^2} + \frac{bB(bc - ad)^2 g^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{200000d^4(c + dx)} \\
&= -\frac{B(bc - ad)^3 g^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{2000000d^4(c + dx)^2} + \frac{bB(bc - ad)^2 g^3 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{200000d^4(c + dx)} \\
&= \frac{B^2(bc - ad)^3 g^3}{4000000d^4(c + dx)^2} - \frac{9bB^2(bc - ad)^2 g^3}{2000000d^4(c + dx)} - \frac{9b^2 B^2(bc - ad)g^3 \log(a + bx)}{2000000d^4} \\
&= \frac{B^2(bc - ad)^3 g^3}{4000000d^4(c + dx)^2} - \frac{9bB^2(bc - ad)^2 g^3}{2000000d^4(c + dx)} - \frac{9b^2 B^2(bc - ad)g^3 \log(a + bx)}{2000000d^4} \\
&= \frac{B^2(bc - ad)^3 g^3}{4000000d^4(c + dx)^2} - \frac{9bB^2(bc - ad)^2 g^3}{2000000d^4(c + dx)} - \frac{9b^2 B^2(bc - ad)g^3 \log(a + bx)}{2000000d^4} \\
&= \frac{B^2(bc - ad)^3 g^3}{4000000d^4(c + dx)^2} - \frac{9bB^2(bc - ad)^2 g^3}{2000000d^4(c + dx)} - \frac{9b^2 B^2(bc - ad)g^3 \log(a + bx)}{2000000d^4}
\end{aligned}$$

**Mathematica [B]** time = 7.81528, size = 6052, normalized size = 9.53

Result too large to show

Antiderivative was successfully verified.

[In] Integrate[((a\*g + b\*g\*x)^3\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2)/(c\*i + d\*i\*x)^3,x]

[Out] Result too large to show

**Maple [F]** time = 2.443, size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^3}{(dix + ci)^3} \left( A + B \ln \left( \frac{e(bx + a)}{dx + c} \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^3\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i)^3,x)

[Out] int((b\*g\*x+a\*g)^3\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i)^3,x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i)^3,x, algorithm="maxima")

[Out] 
$$-3/2*A*B*a^2*b*g^3*(2*(2*d*x + c)*\log(b*e*x/(d*x + c) + a*e/(d*x + c)))/(d^4*i^3*x^2 + 2*c*d^3*i^3*x + c^2*d^2*i^3) - (b*c^2 - 3*a*c*d + 2*(b*c*d - 2*a*d^2)*x)/((b*c*d^4 - a*d^5)*i^3*x^2 + 2*(b*c^2*d^3 - a*c*d^4)*i^3*x + (b*c^3*d^2 - a*c^2*d^3)*i^3) - 2*(b^2*c - 2*a*b*d)*\log(b*x + a)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*i^3) + 2*(b^2*c - 2*a*b*d)*\log(d*x + c)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*i^3) - 1/2*A^2*b^3*g^3*((6*c^2*d*x + 5*c^3)/(d^6*i^3*x^2 + 2*c*d^5*i^3*x + c^2*d^4*i^3) - 2*x/(d^3*i^3) + 6*c*\log(d*x + c))$$

```

/(d^4*i^3)) + 1/2*A*B*a^3*g^3*((2*b*d*x + 3*b*c - a*d)/((b*c*d^3 - a*d^4)*i
^3*x^2 + 2*(b*c^2*d^2 - a*c*d^3)*i^3*x + (b*c^3*d - a*c^2*d^2)*i^3) - 2*log
(b*e*x/(d*x + c) + a*e/(d*x + c))/(d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3)
+ 2*b^2*log(b*x + a)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3) - 2*b^2*log
(d*x + c)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3)) + 3/2*A^2*a*b^2*g^3*((
4*c*d*x + 3*c^2)/(d^5*i^3*x^2 + 2*c*d^4*i^3*x + c^2*d^3*i^3) + 2*log(d*x +
c)/(d^3*i^3)) - 3/2*(2*d*x + c)*A^2*a^2*b*g^3/(d^4*i^3*x^2 + 2*c*d^3*i^3*x
+ c^2*d^2*i^3) - 1/2*A^2*a^3*g^3/(d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3)
- 1/2*(2*((b^3*c*d^2*g^3 - a*b^2*d^3*g^3)*B^2*x^2 + 2*(b^3*c^2*d*g^3 - a*b^
2*c*d^2*g^3)*B^2*x + (b^3*c^3*g^3 - a*b^2*c^2*d*g^3)*B^2)*log(d*x + c)^3 -
(2*B^2*b^3*d^3*g^3*x^3 + 4*B^2*b^3*c*d^2*g^3*x^2 - 2*(2*b^3*c^2*d*g^3 - 6*a
*b^2*c*d^2*g^3 + 3*a^2*b*d^3*g^3)*B^2*x - (5*b^3*c^3*g^3 - 9*a*b^2*c^2*d*g^
3 + 3*a^2*b*c*d^2*g^3 + a^3*d^3*g^3)*B^2)*log(d*x + c)^2)/(d^6*i^3*x^2 + 2*
c*d^5*i^3*x + c^2*d^4*i^3) - integrate(-(3*B^2*a^2*b*d^3*g^3*x*log(e)^2 + B
^2*a^3*d^3*g^3*log(e)^2 + (B^2*b^3*d^3*g^3*log(e)^2 + 2*A*B*b^3*d^3*g^3*log
(e))*x^3 + 3*(B^2*a*b^2*d^3*g^3*log(e)^2 + 2*A*B*a*b^2*d^3*g^3*log(e))*x^2
+ (B^2*b^3*d^3*g^3*x^3 + 3*B^2*a*b^2*d^3*g^3*x^2 + 3*B^2*a^2*b*d^3*g^3*x +
B^2*a^3*d^3*g^3)*log(b*x + a)^2 + 2*(3*B^2*a^2*b*d^3*g^3*x*log(e) + B^2*a^3
*d^3*g^3*log(e) + (B^2*b^3*d^3*g^3*log(e) + A*B*b^3*d^3*g^3)*x^3 + 3*(B^2*a
*b^2*d^3*g^3*log(e) + A*B*a*b^2*d^3*g^3)*x^2)*log(b*x + a) + (2*(2*b^3*c^2*
d*g^3 - 6*a*b^2*c*d^2*g^3 - 3*(g^3*log(e) - g^3)*a^2*b*d^3)*B^2*x - 2*(A*B*
b^3*d^3*g^3 + (g^3*log(e) + g^3)*B^2*b^3*d^3)*x^3 + (5*b^3*c^3*g^3 - 9*a*b^
2*c^2*d*g^3 + 3*a^2*b*c*d^2*g^3 - (2*g^3*log(e) - g^3)*a^3*d^3)*B^2 - 2*(3*
A*B*a*b^2*d^3*g^3 + (3*a*b^2*d^3*g^3*log(e) + 2*b^3*c*d^2*g^3)*B^2)*x^2 - 2
*(B^2*b^3*d^3*g^3*x^3 + 3*B^2*a*b^2*d^3*g^3*x^2 + 3*B^2*a^2*b*d^3*g^3*x + B
^2*a^3*d^3*g^3)*log(b*x + a))*log(d*x + c))/(d^6*i^3*x^3 + 3*c*d^5*i^3*x^2
+ 3*c^2*d^4*i^3*x + c^3*d^3*i^3), x)

```

---

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{A^2 b^3 g^3 x^3 + 3 A^2 a b^2 g^3 x^2 + 3 A^2 a^2 b g^3 x + A^2 a^3 g^3 + (B^2 b^3 g^3 x^3 + 3 B^2 a b^2 g^3 x^2 + 3 B^2 a^2 b g^3 x + B^2 a^3 g^3) \log\left(\frac{bex+a}{dx+c}\right)}{d^3 i^3 x^3 + 3 c d^2 i^3 x^2 + 3 c^2 d i^3 x + c^3 i^3} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```

[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x, alg
orithm="fricas")

```

```

[Out] integral((A^2*b^3*g^3*x^3 + 3*A^2*a*b^2*g^3*x^2 + 3*A^2*a^2*b*g^3*x + A^2*a
^3*g^3 + (B^2*b^3*g^3*x^3 + 3*B^2*a*b^2*g^3*x^2 + 3*B^2*a^2*b*g^3*x + B^2*a
^3*g^3)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*b^3*g^3*x^3 + 3*A*B*a*b^2*g

```

$$\frac{(3x^2 + 3ABa^2bg^3x + A^3B^3g^3) \log\left(\frac{be^x + a}{dx + c}\right)}{(d^3ix^3 + 3c^2d^2i^3x^2 + 3c^2d^2i^3x + c^3i^3)}, x$$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*\*3\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))\*\*2/(d\*i\*x+c\*i)\*\*3,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^3 \left( B \log\left(\frac{(bx+a)e}{dx+c}\right) + A \right)^2}{(dix + ci)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i)^3,x, algorithm="giac")

[Out] integrate((b\*g\*x + a\*g)^3\*(B\*log((b\*x + a)\*e/(d\*x + c)) + A)^2/(d\*i\*x + c\*i)^3, x)

$$3.101 \quad \int \frac{(ag+bgx)^2 \left( A+B \log\left(\frac{e(a+bx)}{c+dx}\right) \right)^2}{(ci+dix)^3} dx$$

**Optimal.** Leaf size=410

$$\frac{2b^2Bg^2 \text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{d^3i^3} + \frac{2b^2B^2g^2 \text{PolyLog}\left(3, \frac{d(a+bx)}{b(c+dx)}\right)}{d^3i^3} - \frac{b^2g^2 \log\left(\frac{bc-ad}{b(c+dx)}\right) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{d^3i^3}$$

[Out]  $-(B^2g^2(a+bx)^2)/(4d^3i^3(c+dx)^2) + (2Ab^2B^2g^2(a+bx))/(d^2i^3(c+dx)) - (2b^2B^2g^2(a+bx))/(d^2i^3(c+dx)) + (2b^2B^2g^2(a+bx)*\text{Log}[(e(a+bx))/(c+dx)])/(d^2i^3(c+dx)) + (B^2g^2(a+bx)^2*(A+B*\text{Log}[(e(a+bx))/(c+dx)]))/(2d^3i^3(c+dx)^2) - (g^2(a+bx)^2*(A+B*\text{Log}[(e(a+bx))/(c+dx)]))^2/(2d^3i^3(c+dx)^2) - (b^2g^2(a+bx)*(A+B*\text{Log}[(e(a+bx))/(c+dx)]))^2/(d^2i^3(c+dx)) - (b^2g^2*\text{Log}[(bc-ad)/(b(c+dx))]*(A+B*\text{Log}[(e(a+bx))/(c+dx)]))^2/(d^3i^3) - (2b^2B^2g^2*(A+B*\text{Log}[(e(a+bx))/(c+dx)]))*\text{PolyLog}[2, (d*(a+bx))/(b(c+dx))]/(d^3i^3) + (2b^2B^2g^2*\text{PolyLog}[3, (d*(a+bx))/(b(c+dx))]/(d^3i^3)$

**Rubi [B]** time = 5.26595, antiderivative size = 1328, normalized size of antiderivative = 3.24, number of steps used = 102, number of rules used = 25, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.595$ , Rules used = {2528, 2525, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 44, 6688, 6742, 2500, 2433, 2375, 2317, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

$$\frac{b^2B^2g^2 \log^3(c+dx)}{3d^3i^3} - \frac{b^2B^2g^2 \log(a+bx) \log^2(c+dx)}{d^3i^3} + \frac{b^2B^2g^2 \log\left(\frac{e(a+bx)}{c+dx}\right) \log^2(c+dx)}{d^3i^3} + \frac{3b^2B^2g^2 \log^2(c+dx)}{2d^3i^3} + \frac{Ab^2B^2g^2 \log(c+dx)}{d^3i^3}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[(a*g + b*g*x)^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x]))^2/(c*i + d*i*x)^3, x]$

[Out]  $-(B^2*(b*c - a*d)^2*g^2)/(4d^3i^3(c+dx)^2) + (5*b^2B^2*(b*c - a*d)*g^2)/(2d^3i^3(c+dx)) + (5*b^2B^2*g^2*\text{Log}[a + b*x])/(2d^3i^3) + (3*b^2B^2*g^2*\text{Log}[a + b*x]^2)/(2d^3i^3) - (b^2*B^2*g^2*\text{Log}[a + b*x]*\text{Log}[(c + d*x)^{-1}])^2/(d^3i^3) + (b^2*B^2*g^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[(c + d*x)^{-1}])^2/(d^3i^3) + (B*(b*c - a*d)^2*g^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(2d^3i^3(c+dx)^2) - (3*b^2B^2*(b*c - a*d)*g^2*(A + B*\text{Log}[(e*(a + b*x))/(c + d*x)]))/(d^3i^3(c+dx)) - (3*b^2B^2*g^2*\text{Log}[a + b*x])$



$$\begin{aligned}
& * (A + B \cdot \text{Log}[(e \cdot (a + b \cdot x)) / (c + d \cdot x)]) / (d^3 \cdot i^3) - ((b \cdot c - a \cdot d)^2 \cdot g^2 \cdot (A + \\
& B \cdot \text{Log}[(e \cdot (a + b \cdot x)) / (c + d \cdot x)])^2) / (2 \cdot d^3 \cdot i^3 \cdot (c + d \cdot x)^2) + (2 \cdot b \cdot (b \cdot c - a \cdot \\
& d) \cdot g^2 \cdot (A + B \cdot \text{Log}[(e \cdot (a + b \cdot x)) / (c + d \cdot x)])^2) / (d^3 \cdot i^3 \cdot (c + d \cdot x)) - (5 \cdot b^2 \\
& \cdot B^2 \cdot g^2 \cdot \text{Log}[c + d \cdot x]) / (2 \cdot d^3 \cdot i^3) - (b^2 \cdot B^2 \cdot g^2 \cdot \text{Log}[a + b \cdot x]^2 \cdot \text{Log}[c + d \cdot \\
& x]) / (d^3 \cdot i^3) - (2 \cdot A \cdot b^2 \cdot B \cdot g^2 \cdot \text{Log}[-((d \cdot (a + b \cdot x)) / (b \cdot c - a \cdot d))] \cdot \text{Log}[c + d \cdot \\
& x]) / (d^3 \cdot i^3) - (3 \cdot b^2 \cdot B^2 \cdot g^2 \cdot \text{Log}[-((d \cdot (a + b \cdot x)) / (b \cdot c - a \cdot d))] \cdot \text{Log}[c + d \cdot \\
& x]) / (d^3 \cdot i^3) - (2 \cdot b^2 \cdot B^2 \cdot g^2 \cdot \text{Log}[a + b \cdot x] \cdot \text{Log}[(c + d \cdot x)^{-1}] \cdot \text{Log}[c + d \cdot x \\
& ]) / (d^3 \cdot i^3) + (2 \cdot b^2 \cdot B^2 \cdot g^2 \cdot \text{Log}[-((d \cdot (a + b \cdot x)) / (b \cdot c - a \cdot d))] \cdot (\text{Log}[a + b \cdot \\
& x] + \text{Log}[(c + d \cdot x)^{-1}] - \text{Log}[(e \cdot (a + b \cdot x)) / (c + d \cdot x)]) \cdot \text{Log}[c + d \cdot x]) / (d^3 \\
& \cdot i^3) + (3 \cdot b^2 \cdot B \cdot g^2 \cdot (A + B \cdot \text{Log}[(e \cdot (a + b \cdot x)) / (c + d \cdot x)]) \cdot \text{Log}[c + d \cdot x]) / (d^3 \\
& \cdot i^3) + (b^2 \cdot g^2 \cdot (A + B \cdot \text{Log}[(e \cdot (a + b \cdot x)) / (c + d \cdot x)])^2 \cdot \text{Log}[c + d \cdot x]) / (d^3 \\
& \cdot i^3) + (A \cdot b^2 \cdot B \cdot g^2 \cdot \text{Log}[c + d \cdot x]^2) / (d^3 \cdot i^3) + (3 \cdot b^2 \cdot B^2 \cdot g^2 \cdot \text{Log}[c + d \cdot x \\
& ]^2) / (2 \cdot d^3 \cdot i^3) - (b^2 \cdot B^2 \cdot g^2 \cdot \text{Log}[a + b \cdot x] \cdot \text{Log}[c + d \cdot x]^2) / (d^3 \cdot i^3) + (b^2 \cdot B^2 \\
& \cdot g^2 \cdot \text{Log}[c + d \cdot x]^3) / (3 \cdot d^3 \cdot i^3) - (3 \cdot b^2 \cdot B^2 \cdot g^2 \cdot \text{Log}[a + b \cdot x] \cdot \text{Log}[(b \cdot (c + \\
& d \cdot x)) / (b \cdot c - a \cdot d)]) / (d^3 \cdot i^3) + (b^2 \cdot B^2 \cdot g^2 \cdot \text{Log}[a + b \cdot x]^2 \cdot \text{Log}[(b \cdot (c + d \cdot \\
& x)) / (b \cdot c - a \cdot d)]) / (d^3 \cdot i^3) - (3 \cdot b^2 \cdot B^2 \cdot g^2 \cdot \text{PolyLog}[2, -((d \cdot (a + b \cdot x)) / (b \cdot \\
& c - a \cdot d))]) / (d^3 \cdot i^3) + (2 \cdot b^2 \cdot B^2 \cdot g^2 \cdot \text{Log}[a + b \cdot x] \cdot \text{PolyLog}[2, -((d \cdot (a + b \cdot \\
& x)) / (b \cdot c - a \cdot d))]) / (d^3 \cdot i^3) - (2 \cdot A \cdot b^2 \cdot B \cdot g^2 \cdot \text{PolyLog}[2, (b \cdot (c + d \cdot x)) / (b \cdot c \\
& - a \cdot d)]) / (d^3 \cdot i^3) - (3 \cdot b^2 \cdot B^2 \cdot g^2 \cdot \text{PolyLog}[2, (b \cdot (c + d \cdot x)) / (b \cdot c - a \cdot d)]) \\
& / (d^3 \cdot i^3) - (2 \cdot b^2 \cdot B^2 \cdot g^2 \cdot \text{Log}[(c + d \cdot x)^{-1}] \cdot \text{PolyLog}[2, (b \cdot (c + d \cdot x)) / (b \\
& \cdot c - a \cdot d)]) / (d^3 \cdot i^3) + (2 \cdot b^2 \cdot B^2 \cdot g^2 \cdot (\text{Log}[a + b \cdot x] + \text{Log}[(c + d \cdot x)^{-1}] \\
& - \text{Log}[(e \cdot (a + b \cdot x)) / (c + d \cdot x)]) \cdot \text{PolyLog}[2, (b \cdot (c + d \cdot x)) / (b \cdot c - a \cdot d)]) / (d^3 \\
& \cdot i^3) - (2 \cdot b^2 \cdot B^2 \cdot g^2 \cdot \text{PolyLog}[3, -((d \cdot (a + b \cdot x)) / (b \cdot c - a \cdot d))]) / (d^3 \cdot i^3) \\
& - (2 \cdot b^2 \cdot B^2 \cdot g^2 \cdot \text{PolyLog}[3, (b \cdot (c + d \cdot x)) / (b \cdot c - a \cdot d)]) / (d^3 \cdot i^3)
\end{aligned}$$

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]

```

### Rule 2525

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]

```

### Rule 12

```

Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match

```

Q[u, (b\_)\*(v\_) /; FreeQ[b, x]]

#### Rule 2524

Int[((a\_.) + Log[(c\_.)\*(Rfx\_)^(p\_.)]\*(b\_.))^(n\_.)/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[d + e\*x]\*(a + b\*Log[c\*Rfx^p])^n)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[d + e\*x]\*(a + b\*Log[c\*Rfx^p])^(n - 1)\*D[Rfx, x])/Rfx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]

#### Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*(Rfx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n])^p, Rfx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[Rfx, x] && IntegerQ[p]

#### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.)\*(x\_))^(q\_.), x\_Symbol] := Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

#### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] := Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

#### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

#### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

#### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

#### Rule 44

```
Int[((a_) + (b_.)*(x_)^(m_.))*((c_.) + (d_.)*(x_)^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

#### Rule 6688

```
Int[u_, x_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifierIntegrandQ[v, u, x]]
```

#### Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]
```

#### Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_)^(p_.))*((c_.) + (d_.)*(x_)^(q_.))^(r_.)]*(s_.) + Log[(i_.)*((g_.) + (h_.)*(x_)^(n_.))*((t_.))]/((j_.) + (k_.)*(x_)), x_Symbol] := Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a + b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x), x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ[b*c - a*d, 0]
```

#### Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]*(b_.))^(p_.)*((f_.) + Log[(h_.)*((i_.) + (j_.)*(x_)^(m_.))*((g_.))*((k_.) + (l_.)*(x_)^(r_.), x_Symbol] := Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(e*i - d*j)/e + (j*x)/e]^m)], x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

#### Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*(a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] := Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m - 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
```

$e, f, r, m, n\}, x] \&\& \text{IGtQ}[p, 0] \&\& \text{NeQ}[d*e, 1]$

### Rule 2317

$\text{Int}[(a_.) + \text{Log}[(c_.)*(x_.)^{(n_.)}]*(b_.)]^{(p_.)}/((d_.) + (e_.)*(x_.)), x\_Symbol] \rightarrow \text{Simp}[(\text{Log}[1 + (e*x)/d]*(a + b*\text{Log}[c*x^n])^p)/e, x] - \text{Dist}[(b*n*p)/e, \text{Int}[(\text{Log}[1 + (e*x)/d]*(a + b*\text{Log}[c*x^n])^{(p-1)})/x, x], x] /; \text{FreeQ}[\{a, b, c, d, e, n\}, x] \&\& \text{IGtQ}[p, 0]$

### Rule 2374

$\text{Int}[(\text{Log}[(d_.)*((e_.) + (f_.)*(x_.)^{(m_.)})])*((a_.) + \text{Log}[(c_.)*(x_.)^{(n_.)}]*(b_.)]^{(p_.)}/(x_.), x\_Symbol] \rightarrow -\text{Simp}[(\text{PolyLog}[2, -(d*f*x^m)]*(a + b*\text{Log}[c*x^n])^p)/m, x] + \text{Dist}[(b*n*p)/m, \text{Int}[(\text{PolyLog}[2, -(d*f*x^m)]*(a + b*\text{Log}[c*x^n])^{(p-1)})/x, x], x] /; \text{FreeQ}[\{a, b, c, d, e, f, m, n\}, x] \&\& \text{IGtQ}[p, 0] \&\& \text{EqQ}[d*e, 1]$

### Rule 6589

$\text{Int}[\text{PolyLog}[n_, (c_.)*((a_.) + (b_.)*(x_.)^{(p_.)})]/((d_.) + (e_.)*(x_.)), x\_Symbol] \rightarrow \text{Simp}[\text{PolyLog}[n + 1, c*(a + b*x)^p]/(e*p), x] /; \text{FreeQ}[\{a, b, c, d, e, n, p\}, x] \&\& \text{EqQ}[b*d, a*e]$

### Rule 2440

$\text{Int}[(a_.) + \text{Log}[(c_.)*((d_.) + (e_.)*(x_.)^{(n_.)})*(b_.))*((f_.) + \text{Log}[(h_.)*((i_.) + (j_.)*(x_.)^{(m_.)})*(g_.))*((k_.) + (l_.)*(x_.)^{(r_.)}), x\_Symbol] \rightarrow \text{Dist}[1/l, \text{Subst}[\text{Int}[x^r*(a + b*\text{Log}[c*(-((e*k - d*1)/1) + (e*x)/1)^n])*(f + g*\text{Log}[h*(-((j*k - i*1)/1) + (j*x)/1)^m]), x], x, k + l*x], x] /; \text{FreeQ}[\{a, b, c, d, e, f, g, h, i, j, k, l, m, n\}, x] \&\& \text{IntegerQ}[r]$

### Rule 2434

$\text{Int}[(a_.) + \text{Log}[(c_.)*((d_.) + (e_.)*(x_.)^{(n_.)})*(b_.))*((f_.) + \text{Log}[(h_.)*((i_.) + (j_.)*(x_.)^{(m_.)})*(g_.))]/(x_.), x\_Symbol] \rightarrow \text{Simp}[\text{Log}[x]*(a + b*\text{Log}[c*(d + e*x)^n])*(f + g*\text{Log}[h*(i + j*x)^m]), x] + (-\text{Dist}[e*g*m, \text{Int}[(\text{Log}[x]*(a + b*\text{Log}[c*(d + e*x)^n])]/(d + e*x), x], x] - \text{Dist}[b*j*n, \text{Int}[(\text{Log}[x]*(f + g*\text{Log}[h*(i + j*x)^m])]/(i + j*x), x], x]) /; \text{FreeQ}[\{a, b, c, d, e, f, g, h, i, j, m, n\}, x] \&\& \text{EqQ}[e*i - d*j, 0]$

### Rule 2499

$\text{Int}[(\text{Log}[(e_.)*((f_.)*((a_.) + (b_.)*(x_.)^{(p_.)}*((c_.) + (d_.)*(x_.)^{(q_.)})^{(r_.)}))*((s_.) + \text{Log}[(i_.)*((g_.) + (h_.)*(x_.)^{(n_.)})*(t_.)]^{(m_.)})]/((j_.) + (k_.)*(x_.)), x\_Symbol] \rightarrow \text{Simp}[(s + t*\text{Log}[i*(g + h*x)^n])^{(m+1)}*\text{Log}[$

```
e*(f*(a + b*x)^p*(c + d*x)^q)^r)/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dist[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

### Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

### Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] := Dist[1/(b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p}, x]
```

### Rule 30

```
Int[(x_)^(m_.), x_Symbol] := Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && NeQ[m, -1]
```

### Rubi steps

$$\begin{aligned}
\int \frac{(ag + bgx)^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(101c + 101dx)^3} dx &= \int \left( \frac{(-bc + ad)^2 g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{1030301d^2(c + dx)^3} - \frac{2b(bc - ad)g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{1030301d^2(c + dx)^2} \right) dx \\
&= \frac{(b^2 g^2) \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{c+dx} dx}{1030301d^2} - \frac{(2b(bc - ad)g^2) \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{(c+dx)^2} dx}{1030301d^2} + \frac{(bc - ad)^2 g^2 \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(c+dx)^2} dx}{2060602d^3(c + dx)^2} \\
&= -\frac{(bc - ad)^2 g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{2060602d^3(c + dx)^2} + \frac{2b(bc - ad)g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{1030301d^3(c + dx)} + \frac{(bc - ad)^2 g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{2060602d^3(c + dx)^2} \\
&= -\frac{(bc - ad)^2 g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{2060602d^3(c + dx)^2} + \frac{2b(bc - ad)g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{1030301d^3(c + dx)} + \frac{(bc - ad)^2 g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{2060602d^3(c + dx)^2} \\
&= -\frac{(bc - ad)^2 g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{2060602d^3(c + dx)^2} + \frac{2b(bc - ad)g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{1030301d^3(c + dx)} + \frac{(bc - ad)^2 g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{2060602d^3(c + dx)^2} \\
&= \frac{B(bc - ad)^2 g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{2060602d^3(c + dx)^2} - \frac{3bB(bc - ad)g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{1030301d^3(c + dx)} \\
&= \frac{B(bc - ad)^2 g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{2060602d^3(c + dx)^2} - \frac{3bB(bc - ad)g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{1030301d^3(c + dx)} \\
&= \frac{B(bc - ad)^2 g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{2060602d^3(c + dx)^2} - \frac{3bB(bc - ad)g^2 \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{1030301d^3(c + dx)} \\
&= -\frac{B^2(bc - ad)^2 g^2}{4121204d^3(c + dx)^2} + \frac{5bB^2(bc - ad)g^2}{2060602d^3(c + dx)} + \frac{5b^2B^2g^2 \log(a + bx)}{2060602d^3} + \frac{B(bc - ad)^2 g^2}{2060602d^3} \\
&= -\frac{B^2(bc - ad)^2 g^2}{4121204d^3(c + dx)^2} + \frac{5bB^2(bc - ad)g^2}{2060602d^3(c + dx)} + \frac{5b^2B^2g^2 \log(a + bx)}{2060602d^3} + \frac{B(bc - ad)^2 g^2}{2060602d^3} \\
&= -\frac{B^2(bc - ad)^2 g^2}{4121204d^3(c + dx)^2} + \frac{5bB^2(bc - ad)g^2}{2060602d^3(c + dx)} + \frac{5b^2B^2g^2 \log(a + bx)}{2060602d^3} + \frac{3b^2B^2g^2}{2060602d^3}
\end{aligned}$$

**Mathematica [B]** time = 5.61032, size = 2950, normalized size = 7.2

Result too large to show

Antiderivative was successfully verified.

[In] Integrate[((a\*g + b\*g\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2)/(c\*i + d\*i\*x)^3,x]

[Out] 
$$\begin{aligned} & (g^2 * ((-2 * A^2 * (b * c - a * d)^2) / (c + d * x)^2 + (8 * A^2 * b * (b * c - a * d)) / (c + d * x) \\ & + 4 * A^2 * b^2 * \text{Log}[c + d * x] - (4 * a * A * b * B * d * (-b^2 * c^3) + 4 * a * b * c^2 * d - 3 * a^2 * c \\ & * d^2 - 2 * b^2 * c^2 * d * x + 6 * a * b * c * d^2 * x - 4 * a^2 * d^3 * x - 2 * b * (b * c - 2 * a * d) * (c + \\ & d * x)^2 * \text{Log}[a + b * x] + 2 * (b * c - a * d)^2 * (c + 2 * d * x) * \text{Log}[(e * (a + b * x)) / (c + d \\ & * x)] + 2 * b^2 * c^3 * \text{Log}[c + d * x] - 4 * a * b * c^2 * d * \text{Log}[c + d * x] + 4 * b^2 * c^2 * d * x * \text{Lo} \\ & g[c + d * x] - 8 * a * b * c * d^2 * x * \text{Log}[c + d * x] + 2 * b^2 * c * d^2 * x^2 * \text{Log}[c + d * x] - 4 * \\ & a * b * d^3 * x^2 * \text{Log}[c + d * x])) / ((b * c - a * d)^2 * (c + d * x)^2) - (2 * a^2 * A * B * d^2 * (- \\ & b^2 * c^2) + 4 * a * b * c * d - a^2 * d^2 + 2 * b^2 * c * d * x + 2 * a * b * d^2 * x + 2 * b^2 * d^2 * x^2 \\ & - 2 * b^2 * (c + d * x)^2 * \text{Log}[a / b + x] + 2 * (b * c - a * d)^2 * \text{Log}[(e * (a + b * x)) / (c + d \\ & * x)] + 2 * b^2 * c^2 * \text{Log}[(b * (c + d * x)) / (b * c - a * d)] + 4 * b^2 * c * d * x * \text{Log}[(b * (c + d \\ & * x)) / (b * c - a * d)] + 2 * b^2 * d^2 * x^2 * \text{Log}[(b * (c + d * x)) / (b * c - a * d)))] / ((b * c - \\ & a * d)^2 * (c + d * x)^2) + 2 * A * b^2 * B * (-2 * \text{Log}[c / d + x]^2 - (8 * c * (1 + \text{Log}[c / d + x] \\ & )) / (c + d * x) + (c^2 * (1 + 2 * \text{Log}[c / d + x])) / (c + d * x)^2 + 8 * c * (\text{Log}[a / b + x] / ( \\ & c + d * x) + (b * (\text{Log}[a + b * x] - \text{Log}[c + d * x])) / (-b * c) + a * d)) + 2 * (-\text{Log}[a / b \\ & + x] + \text{Log}[c / d + x] + \text{Log}[(e * (a + b * x)) / (c + d * x)]) * ((c * (3 * c + 4 * d * x)) / (c + \\ & d * x)^2 + 2 * \text{Log}[c + d * x]) + (2 * c^2 * (-\text{Log}[a / b + x] + (b * (c + d * x) * (b * c - a * d \\ & + b * (c + d * x) * \text{Log}[a + b * x] - b * (c + d * x) * \text{Log}[c + d * x])) / (b * c - a * d)^2) / (c \\ & + d * x)^2 + 4 * (\text{Log}[a / b + x] * \text{Log}[(b * (c + d * x)) / (b * c - a * d)] + \text{PolyLog}[2, (d * \\ & (a + b * x)) / (-b * c) + a * d])) + (2 * a * b * B^2 * d * (2 * c * \text{Log}[(e * (a + b * x)) / (c + d * x \\ & )]^2 - 4 * (c + d * x) * \text{Log}[(e * (a + b * x)) / (c + d * x)]^2 - (4 * (c + d * x) * (2 * b * c - 2 \\ & * a * d + 2 * b * (c + d * x) * \text{Log}[a + b * x] - 2 * (b * c - a * d) * \text{Log}[(e * (a + b * x)) / (c + d * x \\ & )] - 2 * b * (c + d * x) * \text{Log}[a + b * x] * \text{Log}[(e * (a + b * x)) / (c + d * x)] - 2 * b * (c + d * x \\ & ) * \text{Log}[c + d * x] - 2 * b * (c + d * x) * \text{Log}[(e * (a + b * x)) / (c + d * x)] * \text{Log}[(b * c - a * d \\ & ) / (b * c + b * d * x)] + b * (c + d * x) * (\text{Log}[a + b * x] * (\text{Log}[a + b * x] - 2 * \text{Log}[(b * (c + \\ & d * x)) / (b * c - a * d)])) - 2 * \text{PolyLog}[2, (d * (a + b * x)) / (-b * c) + a * d]) + b * (c + \\ & d * x) * (\text{Log}[(b * c - a * d) / (b * c + b * d * x)] * (2 * \text{Log}[(d * (a + b * x)) / (-b * c) + a * d]) + \\ & \text{Log}[(b * c - a * d) / (b * c + b * d * x)]) - 2 * \text{PolyLog}[2, (b * (c + d * x)) / (b * c - a * d)] \\ & )) / (b * c - a * d) + (c * ((b * c - a * d)^2 + 2 * b * (b * c - a * d) * (c + d * x) + 2 * b^2 * (c + \\ & d * x)^2 * \text{Log}[a + b * x] - 2 * (b * c - a * d)^2 * \text{Log}[(e * (a + b * x)) / (c + d * x)] - 4 * b * ( \\ & b * c - a * d) * (c + d * x) * \text{Log}[(e * (a + b * x)) / (c + d * x)] - 4 * b^2 * (c + d * x)^2 * \text{Log}[a \\ & + b * x] * \text{Log}[(e * (a + b * x)) / (c + d * x)] - 2 * b^2 * (c + d * x)^2 * \text{Log}[c + d * x] + 4 * b \\ & * (c + d * x) * (b * c - a * d + b * (c + d * x) * \text{Log}[a + b * x] - b * (c + d * x) * \text{Log}[c + d * x] \\ & ) - 4 * b^2 * (c + d * x)^2 * \text{Log}[(e * (a + b * x)) / (c + d * x)] * \text{Log}[(b * c - a * d) / (b * c + b \\ & * d * x)] + 2 * b^2 * (c + d * x)^2 * (\text{Log}[a + b * x] * (\text{Log}[a + b * x] - 2 * \text{Log}[(b * (c + d * x) \\ & ) / (b * c - a * d)])) - 2 * \text{PolyLog}[2, (d * (a + b * x)) / (-b * c) + a * d]) + 2 * b^2 * (c + \end{aligned}$$

$$\begin{aligned}
& d*x)^2*(\text{Log}[(b*c - a*d)/(b*c + b*d*x)]*(2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] \\
& + \text{Log}[(b*c - a*d)/(b*c + b*d*x)]) - 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d) \\
& ])))/(b*c - a*d)^2)/(c + d*x)^2 - (a^2*B^2*d^2*((b*c - a*d)^2 + 2*b*(b*c - \\
& a*d)*(c + d*x) + 2*b^2*(c + d*x)^2*\text{Log}[a + b*x] - 2*(b*c - a*d)^2*\text{Log}[(e*( \\
& a + b*x))/(c + d*x)] - 4*b*(b*c - a*d)*(c + d*x)*\text{Log}[(e*(a + b*x))/(c + d*x) \\
& ]) - 4*b^2*(c + d*x)^2*\text{Log}[a + b*x]*\text{Log}[(e*(a + b*x))/(c + d*x)] + 2*(b*c - \\
& a*d)^2*\text{Log}[(e*(a + b*x))/(c + d*x)]^2 - 2*b^2*(c + d*x)^2*\text{Log}[c + d*x] + 4 \\
& *b*(c + d*x)*(b*c - a*d + b*(c + d*x)*\text{Log}[a + b*x] - b*(c + d*x)*\text{Log}[c + d* \\
& x]) - 4*b^2*(c + d*x)^2*\text{Log}[(e*(a + b*x))/(c + d*x)]*\text{Log}[(b*c - a*d)/(b*c + \\
& b*d*x)] + 2*b^2*(c + d*x)^2*(\text{Log}[a + b*x]*(\text{Log}[a + b*x] - 2*\text{Log}[(b*(c + d* \\
& x))/(b*c - a*d)]) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*b^2*(c \\
& + d*x)^2*(\text{Log}[(b*c - a*d)/(b*c + b*d*x)]*(2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d) \\
& ]) + \text{Log}[(b*c - a*d)/(b*c + b*d*x)]) - 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d) \\
& d)])))/((b*c - a*d)^2*(c + d*x)^2) - 2*b^2*B^2*((c^2*\text{Log}[(e*(a + b*x))/(c + \\
& d*x)]^2)/(c + d*x)^2 - (4*c*\text{Log}[(e*(a + b*x))/(c + d*x)]^2)/(c + d*x) + 2* \\
& \text{Log}[(e*(a + b*x))/(c + d*x)]^2*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] + 4*\text{Log}[(e*(a \\
& + b*x))/(c + d*x)]*\text{PolyLog}[2, (d*(a + b*x))/(b*(c + d*x))] - (4*c*(2*b*c - \\
& 2*a*d + 2*b*(c + d*x)*\text{Log}[a + b*x] - 2*(b*c - a*d)*\text{Log}[(e*(a + b*x))/(c + \\
& d*x)] - 2*b*(c + d*x)*\text{Log}[a + b*x]*\text{Log}[(e*(a + b*x))/(c + d*x)] - 2*b*(c + \\
& d*x)*\text{Log}[c + d*x] - 2*b*(c + d*x)*\text{Log}[(e*(a + b*x))/(c + d*x)]*\text{Log}[(b*c - a \\
& *d)/(b*c + b*d*x)] + b*(c + d*x)*(\text{Log}[a + b*x]*(\text{Log}[a + b*x] - 2*\text{Log}[(b*(c \\
& + d*x))/(b*c - a*d)]) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*(c \\
& + d*x)*(\text{Log}[(b*c - a*d)/(b*c + b*d*x)]*(2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] \\
& + \text{Log}[(b*c - a*d)/(b*c + b*d*x)]) - 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d) \\
& ])))/((b*c - a*d)*(c + d*x)) + (c^2*((b*c - a*d)^2 + 2*b*(b*c - a*d)*(c + d \\
& *x) + 2*b^2*(c + d*x)^2*\text{Log}[a + b*x] - 2*(b*c - a*d)^2*\text{Log}[(e*(a + b*x))/(c \\
& + d*x)] - 4*b*(b*c - a*d)*(c + d*x)*\text{Log}[(e*(a + b*x))/(c + d*x)] - 4*b^2*(c \\
& + d*x)^2*\text{Log}[a + b*x]*\text{Log}[(e*(a + b*x))/(c + d*x)] - 2*b^2*(c + d*x)^2*\text{Lo \\
& g}[c + d*x] + 4*b*(c + d*x)*(b*c - a*d + b*(c + d*x)*\text{Log}[a + b*x] - b*(c + d \\
& *x)*\text{Log}[c + d*x]) - 4*b^2*(c + d*x)^2*\text{Log}[(e*(a + b*x))/(c + d*x)]*\text{Log}[(b*c \\
& - a*d)/(b*c + b*d*x)] + 2*b^2*(c + d*x)^2*(\text{Log}[a + b*x]*(\text{Log}[a + b*x] - 2* \\
& \text{Log}[(b*(c + d*x))/(b*c - a*d)]) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-(b*c) + a*d) \\
& ]) + 2*b^2*(c + d*x)^2*(\text{Log}[(b*c - a*d)/(b*c + b*d*x)]*(2*\text{Log}[(d*(a + b*x)) \\
& ]/(-(b*c) + a*d)] + \text{Log}[(b*c - a*d)/(b*c + b*d*x)]) - 2*\text{PolyLog}[2, (b*(c + d \\
& *x))/(b*c - a*d)])))/(2*(b*c - a*d)^2*(c + d*x)^2) - 4*\text{PolyLog}[3, (d*(a + b \\
& *x))/(b*(c + d*x)))])))/(4*d^3*i^3)
\end{aligned}$$

**Maple [F]** time = 2.149, size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^2}{(dix + ci)^3} \left( A + B \ln \left( \frac{e(bx + a)}{dx + c} \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.



```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x)
```

```
[Out] int((b*g*x+a*g)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x)
```

**Maxima [F]** time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x, alg
orithm="maxima")
```

```
[Out] -A*B*a*b*g^2*(2*(2*d*x + c)*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(d^4*i^3*x
^2 + 2*c*d^3*i^3*x + c^2*d^2*i^3) - (b*c^2 - 3*a*c*d + 2*(b*c*d - 2*a*d^2)*
x)/((b*c*d^4 - a*d^5)*i^3*x^2 + 2*(b*c^2*d^3 - a*c*d^4)*i^3*x + (b*c^3*d^2
- a*c^2*d^3)*i^3) - 2*(b^2*c - 2*a*b*d)*log(b*x + a)/((b^2*c^2*d^2 - 2*a*b*
c*d^3 + a^2*d^4)*i^3) + 2*(b^2*c - 2*a*b*d)*log(d*x + c)/((b^2*c^2*d^2 - 2*
a*b*c*d^3 + a^2*d^4)*i^3)) + 1/2*A*B*a^2*g^2*((2*b*d*x + 3*b*c - a*d)/((b*c
*d^3 - a*d^4)*i^3*x^2 + 2*(b*c^2*d^2 - a*c*d^3)*i^3*x + (b*c^3*d - a*c^2*d^
2)*i^3) - 2*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(d^3*i^3*x^2 + 2*c*d^2*i^3
*x + c^2*d*i^3) + 2*b^2*log(b*x + a)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i
^3) - 2*b^2*log(d*x + c)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3)) + 1/2*A
^2*b^2*g^2*((4*c*d*x + 3*c^2)/(d^5*i^3*x^2 + 2*c*d^4*i^3*x + c^2*d^3*i^3) +
2*log(d*x + c)/(d^3*i^3)) - (2*d*x + c)*A^2*a*b*g^2/(d^4*i^3*x^2 + 2*c*d^3
*i^3*x + c^2*d^2*i^3) - 1/2*A^2*a^2*g^2/(d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*
d*i^3) + 1/6*(2*(B^2*b^2*d^2*g^2*x^2 + 2*B^2*b^2*c*d*g^2*x + B^2*b^2*c^2*g^
2)*log(d*x + c)^3 + 3*(4*(b^2*c*d*g^2 - a*b*d^2*g^2)*B^2*x + (3*b^2*c^2*g^2
- 2*a*b*c*d*g^2 - a^2*d^2*g^2)*B^2)*log(d*x + c)^2)/(d^5*i^3*x^2 + 2*c*d^4
*i^3*x + c^2*d^3*i^3) - integrate(-(2*B^2*a*b*d^2*g^2*x*log(e)^2 + B^2*a^2*
d^2*g^2*log(e)^2 + (B^2*b^2*d^2*g^2*log(e)^2 + 2*A*B*b^2*d^2*g^2*log(e))*x^
2 + (B^2*b^2*d^2*g^2*x^2 + 2*B^2*a*b*d^2*g^2*x + B^2*a^2*d^2*g^2)*log(b*x +
a)^2 + 2*(2*B^2*a*b*d^2*g^2*x*log(e) + B^2*a^2*d^2*g^2*log(e) + (B^2*b^2*d
^2*g^2*log(e) + A*B*b^2*d^2*g^2)*x^2)*log(b*x + a) - (4*(b^2*c*d*g^2 + (g^2
*log(e) - g^2)*a*b*d^2)*B^2*x + (3*b^2*c^2*g^2 - 2*a*b*c*d*g^2 + (2*g^2*log
(e) - g^2)*a^2*d^2)*B^2 + 2*(B^2*b^2*d^2*g^2*log(e) + A*B*b^2*d^2*g^2)*x^2
+ 2*(B^2*b^2*d^2*g^2*x^2 + 2*B^2*a*b*d^2*g^2*x + B^2*a^2*d^2*g^2)*log(b*x +
a))*log(d*x + c))/(d^5*i^3*x^3 + 3*c*d^4*i^3*x^2 + 3*c^2*d^3*i^3*x + c^3*d
^2*i^3), x)
```

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{A^2 b^2 g^2 x^2 + 2 A^2 a b g^2 x + A^2 a^2 g^2 + (B^2 b^2 g^2 x^2 + 2 B^2 a b g^2 x + B^2 a^2 g^2) \log\left(\frac{bex+ae}{dx+c}\right)^2 + 2 (ABb^2 g^2 x^2 + 2 ABabg^2 x + ABa^2 g^2)}{d^3 i^3 x^3 + 3 cd^2 i^3 x^2 + 3 c^2 d i^3 x + c^3 i^3} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i)^3,x, algorithm="fricas")

[Out] integral((A^2\*b^2\*g^2\*x^2 + 2\*A^2\*a\*b\*g^2\*x + A^2\*a^2\*g^2 + (B^2\*b^2\*g^2\*x^2 + 2\*B^2\*a\*b\*g^2\*x + B^2\*a^2\*g^2)\*log((b\*e\*x + a\*e)/(d\*x + c))^2 + 2\*(A\*B\*b^2\*g^2\*x^2 + 2\*A\*B\*a\*b\*g^2\*x + A\*B\*a^2\*g^2)\*log((b\*e\*x + a\*e)/(d\*x + c)))/(d^3\*i^3\*x^3 + 3\*c\*d^2\*i^3\*x^2 + 3\*c^2\*d\*i^3\*x + c^3\*i^3), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*\*2\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))\*\*2/(d\*i\*x+c\*i)\*\*3,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^2 \left( B \log\left(\frac{(bx+a)e}{dx+c}\right) + A \right)^2}{(dix + ci)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i)^3,x, algorithm="giac")

[Out] integrate((b\*g\*x + a\*g)^2\*(B\*log((b\*x + a)\*e/(d\*x + c)) + A)^2/(d\*i\*x + c\*i)^3, x)

$$3.102 \quad \int \frac{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ci+dix)^3} dx$$

**Optimal.** Leaf size=141

$$\frac{g(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2i^3(c+dx)^2(bc-ad)} - \frac{Bg(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2i^3(c+dx)^2(bc-ad)} + \frac{B^2g(a+bx)^2}{4i^3(c+dx)^2(bc-ad)}$$

[Out]  $(B^2g(a+bx)^2)/(4*(b*c - a*d)*i^3*(c + d*x)^2) - (B*g*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])/(2*(b*c - a*d)*i^3*(c + d*x)^2) + (g*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*(b*c - a*d)*i^3*(c + d*x)^2)$

**Rubi [C]** time = 1.96088, antiderivative size = 634, normalized size of antiderivative = 4.5, number of steps used = 58, number of rules used = 11, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.275$ , Rules used = {2528, 2525, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 44}

$$\frac{b^2B^2g\text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{d^2i^3(bc-ad)} + \frac{b^2B^2g\text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{d^2i^3(bc-ad)} + \frac{b^2Bg\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{d^2i^3(bc-ad)} - \frac{b^2Bg\log(c+dx)}{d^2i^3}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[\frac{(a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2}{(c*i + d*i*x)^3}, x]$

[Out]  $(B^2*(b*c - a*d)*g)/(4*d^2*i^3*(c + d*x)^2) - (b*B^2*g)/(2*d^2*i^3*(c + d*x)) - (b^2*B^2*g*Log[a + b*x])/(2*d^2*(b*c - a*d)*i^3) - (b^2*B^2*g*Log[a + b*x]^2)/(2*d^2*(b*c - a*d)*i^3) - (B*(b*c - a*d)*g*(A + B*Log[(e*(a + b*x))/(c + d*x)])/(2*d^2*i^3*(c + d*x)^2) + (b*B*g*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^2*i^3*(c + d*x)) + (b^2*B*g*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(d^2*(b*c - a*d)*i^3) + ((b*c - a*d)*g*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*d^2*i^3*(c + d*x)^2) - (b*g*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(d^2*i^3*(c + d*x)) + (b^2*B^2*g*Log[c + d*x])/(2*d^2*(b*c - a*d)*i^3) + (b^2*B^2*g*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d^2*(b*c - a*d)*i^3) - (b^2*B*g*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(d^2*(b*c - a*d)*i^3) - (b^2*B^2*g*Log[c + d*x]^2)/(2*d^2*(b*c - a*d)*i^3) + (b^2*B^2*g*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)]/(d^2*(b*c - a*d)*i^3) + (b^2*B^2*g*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(d^2*(b*c - a*d)*i^3) + (b^2*B^2*g*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]/(d^2*(b*c - a*d)*i^3) + (b^2*B^2*g*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]/(d^2*(b*c - a*d)*i^3)$

$c - a*d)*i^3)$

### Rule 2528

Int[((a\_.) + Log[(c\_.)\*(Rfx\_)^(p\_.)]\*(b\_.))^(n\_.)\*(RGx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*Rfx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

### Rule 2525

Int[((a\_.) + Log[(c\_.)\*(Rfx\_)^(p\_.)]\*(b\_.))^(n\_.)\*((d\_.) + (e\_.)\*(x\_))^(m\_.), x\_Symbol] := Simp[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*Rfx^p])^n)/(e\*(m + 1)), x] - Dist[(b\*n\*p)/(e\*(m + 1)), Int[SimplifyIntegrand[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*Rfx^p])^(n - 1)\*D[Rfx, x])/Rfx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

### Rule 12

Int[(a\_)\*(u\_), x\_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b\_)\*(v\_)] /; FreeQ[b, x]

### Rule 2524

Int[((a\_.) + Log[(c\_.)\*(Rfx\_)^(p\_.)]\*(b\_.))^(n\_.)/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[d + e\*x]\*(a + b\*Log[c\*Rfx^p])^n)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[d + e\*x]\*(a + b\*Log[c\*Rfx^p])^(n - 1)\*D[Rfx, x])/Rfx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]

### Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*(Rfx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n])^p, Rfx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[Rfx, x] && IntegerQ[p]

### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.)\*(x\_))^(q\_.), x\_Symbol] := Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] :> Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :> Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n]))/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))])\*(b\_.)/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :> Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] :> -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

Rule 44

Int[((a\_) + (b\_.)\*(x\_)^(m\_.))\*((c\_.) + (d\_.)\*(x\_)^(n\_.)), x\_Symbol] :> Int[ExpandIntegrand[(a + b\*x)^m\*(c + d\*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b\*c - a\*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])

Rubi steps

$$\begin{aligned}
\int \frac{(ag + bgx) \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(102c + 102dx)^3} dx &= \int \left( \frac{(-bc + ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{1061208d(c + dx)^3} + \frac{bg \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{1061208d(c + dx)^2} \right) dx \\
&= \frac{(bg) \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(c+dx)^2} dx}{1061208d} - \frac{((bc - ad)g) \int \frac{\left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{(c+dx)^3} dx}{1061208d} \\
&= \frac{(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{2122416d^2(c + dx)^2} - \frac{bg \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{1061208d^2(c + dx)} + \frac{(bBg) \int \frac{(bc-ad)}{(a+bx)^2} dx}{530} \\
&= \frac{(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{2122416d^2(c + dx)^2} - \frac{bg \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{1061208d^2(c + dx)} + \frac{(bB(bc - ad)g)}{53} \\
&= \frac{(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{2122416d^2(c + dx)^2} - \frac{bg \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{1061208d^2(c + dx)} + \frac{(bB(bc - ad)g)}{53} \\
&= \frac{(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{2122416d^2(c + dx)^2} - \frac{bg \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{1061208d^2(c + dx)} + \frac{(bB(bc - ad)g)}{53} \\
&= \frac{(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{2122416d^2(c + dx)^2} - \frac{bg \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)^2}{1061208d^2(c + dx)} + \frac{(bBg) \int \frac{A+B \log}{(c+dx)} dx}{106120} \\
&= -\frac{B(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{2122416d^2(c + dx)^2} + \frac{bBg \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{1061208d^2(c + dx)} + \frac{b^2Bg \log(a - bx)}{106120} \\
&= -\frac{B(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{2122416d^2(c + dx)^2} + \frac{bBg \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{1061208d^2(c + dx)} + \frac{b^2Bg \log(a - bx)}{106120} \\
&= -\frac{B(bc - ad)g \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{2122416d^2(c + dx)^2} + \frac{bBg \left( A + B \log \left( \frac{e(a+bx)}{c+dx} \right) \right)}{1061208d^2(c + dx)} + \frac{b^2Bg \log(a - bx)}{106120} \\
&= \frac{B^2(bc - ad)g}{4244832d^2(c + dx)^2} - \frac{bB^2g}{2122416d^2(c + dx)} - \frac{b^2B^2g \log(a + bx)}{2122416d^2(bc - ad)} - \frac{B(bc - ad)g}{2122416d^2} \\
&= \frac{B^2(bc - ad)g}{4244832d^2(c + dx)^2} - \frac{bB^2g}{2122416d^2(c + dx)} - \frac{b^2B^2g \log(a + bx)}{2122416d^2(bc - ad)} - \frac{B(bc - ad)g}{2122416d^2} \\
&= \frac{B^2(bc - ad)g}{4244832d^2(c + dx)^2} - \frac{bB^2g}{2122416d^2(c + dx)} - \frac{b^2B^2g \log(a + bx)}{2122416d^2(bc - ad)} - \frac{b^2B^2g \log^2(a + bx)}{2122416d^2} \\
&= \frac{B^2(bc - ad)g}{4244832d^2(c + dx)^2} - \frac{bB^2g}{2122416d^2(c + dx)} - \frac{b^2B^2g \log(a + bx)}{2122416d^2(bc - ad)} - \frac{b^2B^2g \log^2(a + bx)}{2122416d^2}
\end{aligned}$$

**Mathematica [C]** time = 0.897672, size = 767, normalized size = 5.44

$$g \left( -B \left( -2b^2 B(c + dx)^2 \left( \log(a + bx) \left( \log(a + bx) - 2 \log \left( \frac{b(c+dx)}{bc-ad} \right) \right) - 2 \text{PolyLog} \left( 2, \frac{d(a+bx)}{ad-bc} \right) \right) \right) + 2b^2 B(c + dx)^2 \left( 2 \text{PolyLog} \right. \right.$$

Antiderivative was successfully verified.

[In] Integrate[((a\*g + b\*g\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))^2)/(c\*i + d\*i\*x)^3,x]

[Out] (g\*(2\*(b\*c - a\*d)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))^2 - 4\*b\*(b\*c - a\*d)\*(c + d\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))^2 + 4\*b\*B\*(c + d\*x)\*(2\*(b\*c - a\*d)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])) + 2\*b\*(c + d\*x)\*Log[a + b\*x]\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])) - 2\*b\*(c + d\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))\*Log[c + d\*x] - 2\*B\*(b\*c - a\*d + b\*(c + d\*x)\*Log[a + b\*x] - b\*(c + d\*x)\*Log[c + d\*x]) - b\*B\*(c + d\*x)\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]) - 2\*PolyLog[2, (d\*(a + b\*x))/(-b\*c) + a\*d]) + b\*B\*(c + d\*x)\*((2\*Log[(d\*(a + b\*x))/(-b\*c) + a\*d]) - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)]) - B\*(2\*(b\*c - a\*d)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])) + 4\*b\*(b\*c - a\*d)\*(c + d\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])) + 4\*b^2\*(c + d\*x)^2\*Log[a + b\*x]\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x])) - 4\*b^2\*(c + d\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))\*Log[c + d\*x] - 4\*b\*B\*(c + d\*x)\*(b\*c - a\*d + b\*(c + d\*x)\*Log[a + b\*x] - b\*(c + d\*x)\*Log[c + d\*x]) - B\*((b\*c - a\*d)^2 + 2\*b\*(b\*c - a\*d)\*(c + d\*x) + 2\*b^2\*(c + d\*x)^2\*Log[a + b\*x] - 2\*b^2\*(c + d\*x)^2\*Log[c + d\*x]) - 2\*b^2\*B\*(c + d\*x)^2\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]) - 2\*PolyLog[2, (d\*(a + b\*x))/(-b\*c) + a\*d]) + 2\*b^2\*B\*(c + d\*x)^2\*((2\*Log[(d\*(a + b\*x))/(-b\*c) + a\*d]) - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])))/(4\*d^2\*(b\*c - a\*d)\*i^3\*(c + d\*x)^2)

**Maple [B]** time = 0.059, size = 2449, normalized size = 17.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i)^3,x)

[Out] 1/2/d^2\*g/(a\*d-b\*c)^2/i^3\*B^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))^2\*b^3\*c+3/4\*g/(a\*d-b\*c)^2/i^3\*B^2/(d\*x+c)^2\*a^2\*b\*c-1/2/d^2\*g/(a\*d-b\*c)^2/i^3\*B^2\*b^3/(d\*x+c)\*c^2+1/4/d^2\*g/(a\*d-b\*c)^2/i^3\*B^2/(d\*x+c)^2\*b^3\*c^3-2\*g/(a\*d-b\*c)^2/i

$$\begin{aligned}
&^3A*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b/(d*x+c)*a^{-3/2}*g/(a*d-b*c)^2/i^3* \\
&A*B/(d*x+c)^2*a^2*b*c-1/d^2*g/(a*d-b*c)^2/i^3*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d \\
&*x+c))^2*b^3/(d*x+c)*c^2+1/2/d^2*g/(a*d-b*c)^2/i^3*B^2*\ln(b*e/d+(a*d-b \\
&*c)*e/d/(d*x+c))*b^3/(d*x+c)*c^2-1/2/d^2*g/(a*d-b*c)^2/i^3*B^2*\ln(b*e/d+(a* \\
&d-b*c)*e/d/(d*x+c))/(d*x+c)^2*b^3*c^3+3/2*g/(a*d-b*c)^2/i^3*B^2*\ln(b*e/d+(a \\
&*d-b*c)*e/d/(d*x+c))^2/(d*x+c)^2*a^2*b*c-1/2/d^2*g/(a*d-b*c)^2/i^3*A*B/(d*x \\
&+c)^2*b^3*c^3-3/2/d*g/(a*d-b*c)^2/i^3*A^2/(d*x+c)^2*b^2*c^2*a+2/d*g/(a*d-b* \\
&c)^2/i^3*A^2*b^2/(d*x+c)*c*a+1/d*g/(a*d-b*c)^2/i^3*B^2*b^2/(d*x+c)*a*c-3/4/ \\
&d*g/(a*d-b*c)^2/i^3*B^2/(d*x+c)^2*b^2*c^2*a+1/d^2*g/(a*d-b*c)^2/i^3*A*B*b^3 \\
&/ (d*x+c)*c^2-3/2*g/(a*d-b*c)^2/i^3*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x \\
&+c)^2*a^2*b*c-2/d^2*g/(a*d-b*c)^2/i^3*A*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b \\
&^3/(d*x+c)*c^2+2/d*g/(a*d-b*c)^2/i^3*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2* \\
&b^2/(d*x+c)*a*c-2/d*g/(a*d-b*c)^2/i^3*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b \\
&^2/(d*x+c)*a*c-3/2/d*g/(a*d-b*c)^2/i^3*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^ \\
&2/(d*x+c)^2*a*b^2*c^2+3/2/d*g/(a*d-b*c)^2/i^3*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d \\
&*x+c))/(d*x+c)^2*a*b^2*c^2+3*g/(a*d-b*c)^2/i^3*A*B*\ln(b*e/d+(a*d-b*c)*e/d/( \\
&d*x+c))/(d*x+c)^2*a^2*b*c+1/d^2*g/(a*d-b*c)^2/i^3*A*B*\ln(b*e/d+(a*d-b*c)*e/ \\
&d/(d*x+c))/(d*x+c)^2*b^3*c^3-2/d*g/(a*d-b*c)^2/i^3*A*B*b^2/(d*x+c)*c*a+3/2/ \\
&d*g/(a*d-b*c)^2/i^3*A*B/(d*x+c)^2*a*b^2*c^2+1/d^2*g/(a*d-b*c)^2/i^3*A*B*\ln( \\
&b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3*c-1/2*d*g/(a*d-b*c)^2/i^3*A^2/(d*x+c)^2*a^ \\
&3-1/4*d*g/(a*d-b*c)^2/i^3*B^2/(d*x+c)^2*a^3-1/2*g/(a*d-b*c)^2/i^3*B^2*b/(d* \\
&x+c)*a^2-g/(a*d-b*c)^2/i^3*A^2*b/(d*x+c)*a^2+1/4/d^2*g/(a*d-b*c)^2/i^3*B^2* \\
&b^3*c+1/2/d^2*g/(a*d-b*c)^2/i^3*A^2*b^3*c-1/2/d*g/(a*d-b*c)^2/i^3*A^2*b^2*a \\
&-1/4/d*g/(a*d-b*c)^2/i^3*B^2*b^2*a-1/2*d*g/(a*d-b*c)^2/i^3*B^2*\ln(b*e/d+(a* \\
&d-b*c)*e/d/(d*x+c))^2/(d*x+c)^2*a^3-g/(a*d-b*c)^2/i^3*B^2*\ln(b*e/d+(a*d-b*c \\
&))*e/d/(d*x+c))^2*b/(d*x+c)*a^2+1/2*d*g/(a*d-b*c)^2/i^3*B^2*\ln(b*e/d+(a*d-b* \\
&c)*e/d/(d*x+c))/(d*x+c)^2*a^3+1/2/d*g/(a*d-b*c)^2/i^3*B^2*\ln(b*e/d+(a*d-b*c \\
&))*e/d/(d*x+c))*b^2*a+3/2*g/(a*d-b*c)^2/i^3*A^2/(d*x+c)^2*a^2*b*c+g/(a*d-b*c \\
&)^2/i^3*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b/(d*x+c)*a^2-1/2/d^2*g/(a*d-b* \\
&c)^2/i^3*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3*c-1/2/d*g/(a*d-b*c)^2/i^3* \\
&B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b^2*a-1/2/d^2*g/(a*d-b*c)^2/i^3*A*B*b \\
&^3*c-1/d^2*g/(a*d-b*c)^2/i^3*A^2*b^3/(d*x+c)*c^2+1/2/d^2*g/(a*d-b*c)^2/i^3* \\
&A^2/(d*x+c)^2*b^3*c^3+1/2*d*g/(a*d-b*c)^2/i^3*A*B/(d*x+c)^2*a^3+g/(a*d-b*c) \\
&^2/i^3*A*B*b/(d*x+c)*a^2-3/d*g/(a*d-b*c)^2/i^3*A*B*\ln(b*e/d+(a*d-b*c)*e/d/( \\
&d*x+c))/(d*x+c)^2*a*b^2*c^2+4/d*g/(a*d-b*c)^2/i^3*A*B*\ln(b*e/d+(a*d-b*c)*e/ \\
&d/(d*x+c))*b^2/(d*x+c)*a*c-1/d*g/(a*d-b*c)^2/i^3*A*B*\ln(b*e/d+(a*d-b*c)*e/d \\
&/ (d*x+c))*b^2*a-d*g/(a*d-b*c)^2/i^3*A*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d* \\
&x+c)^2*a^3+1/2/d*g/(a*d-b*c)^2/i^3*A*B*b^2*a
\end{aligned}$$


---

**Maxima [B]** time = 1.9975, size = 2654, normalized size = 18.82

result too large to display



Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i)^3,x, algorithm="maxima")

[Out] 
$$-1/2*(2*d*x + c)*B^2*b*g*\log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(d^4*i^3*x^2 + 2*c*d^3*i^3*x + c^2*d^2*i^3) + 1/4*(2*((2*b*d*x + 3*b*c - a*d)/((b*c*d^3 - a*d^4)*i^3*x^2 + 2*(b*c^2*d^2 - a*c*d^3)*i^3*x + (b*c^3*d - a*c^2*d^2)*i^3) + 2*b^2*\log(b*x + a)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3) - 2*b^2*\log(d*x + c)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3))*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) - (7*b^2*c^2 - 8*a*b*c*d + a^2*d^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*\log(b*x + a)^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*\log(d*x + c)^2 + 6*(b^2*c*d - a*b*d^2)*x + 6*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*\log(b*x + a) - 2*(3*b^2*d^2*x^2 + 6*b^2*c*d*x + 3*b^2*c^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*\log(b*x + a))*\log(d*x + c))/(b^2*c^4*d*i^3 - 2*a*b*c^3*d^2*i^3 + a^2*c^2*d^3*i^3 + (b^2*c^2*d^3*i^3 - 2*a*b*c*d^4*i^3 + a^2*d^5*i^3)*x^2 + 2*(b^2*c^3*d^2*i^3 - 2*a*b*c^2*d^3*i^3 + a^2*c*d^4*i^3)*x))*B^2*a*g + 1/4*(2*((b*c^2 - 3*a*c*d + 2*(b*c*d - 2*a*d^2)*x)/((b*c*d^4 - a*d^5)*i^3*x^2 + 2*(b*c^2*d^3 - a*c*d^4)*i^3*x + (b*c^3*d^2 - a*c^2*d^3)*i^3) + 2*(b^2*c - 2*a*b*d)*\log(b*x + a)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*i^3) - 2*(b^2*c - 2*a*b*d)*\log(d*x + c)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*i^3))*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) - (b^2*c^3 - 8*a*b*c^2*d + 7*a^2*c*d^2 + 2*(b^2*c^3 - 2*a*b*c^2*d + (b^2*c*d^2 - 2*a*b*d^3)*x^2 + 2*(b^2*c^2*d - 2*a*b*c*d^2)*x)*\log(b*x + a)^2 + 2*(b^2*c^3 - 2*a*b*c^2*d + (b^2*c*d^2 - 2*a*b*d^3)*x^2 + 2*(b^2*c^2*d - 2*a*b*c*d^2)*x)*\log(d*x + c)^2 + 2*(b^2*c^2*d - 5*a*b*c*d^2 + 4*a^2*d^3)*x + 2*(b^2*c^3 - 4*a*b*c^2*d + (b^2*c*d^2 - 4*a*b*d^3)*x^2 + 2*(b^2*c^2*d - 4*a*b*c*d^2)*x)*\log(b*x + a) - 2*(b^2*c^3 - 4*a*b*c^2*d + (b^2*c*d^2 - 4*a*b*d^3)*x^2 + 2*(b^2*c^2*d - 4*a*b*c*d^2)*x)*\log(d*x + c))/((b^2*c^4*d^2*i^3 - 2*a*b*c^3*d^3*i^3 + a^2*c^2*d^4*i^3 + (b^2*c^2*d^4*i^3 - 2*a*b*c*d^5*i^3 + a^2*d^6*i^3)*x^2 + 2*(b^2*c^3*d^3*i^3 - 2*a*b*c^2*d^4*i^3 + a^2*c*d^5*i^3)*x))*B^2*b*g - 1/2*A*B*b*g*(2*(2*d*x + c)*\log(b*e*x/(d*x + c) + a*e/(d*x + c))/((d^4*i^3*x^2 + 2*c*d^3*i^3*x + c^2*d^2*i^3) - (b*c^2 - 3*a*c*d + 2*(b*c*d - 2*a*d^2)*x)/((b*c*d^4 - a*d^5)*i^3*x^2 + 2*(b*c^2*d^3 - a*c*d^4)*i^3*x + (b*c^3*d^2 - a*c^2*d^3)*i^3) - 2*(b^2*c - 2*a*b*d)*\log(b*x + a)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*i^3) + 2*(b^2*c - 2*a*b*d)*\log(d*x + c)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*i^3)) + 1/2*A*B*a*g*((2*b*d*x + 3*b*c - a*d)/((b*c*d^3 - a*d^4)*i^3*x^2 + 2*(b*c^2*d^2 - a*c*d^3)*i^3*x + (b*c^3*d - a*c^2*d^2)*i^3) - 2*\log(b*e*x/(d*x + c) + a*e/(d*x + c))/((d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3) + 2*b^2*\log(b*x + a)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3) - 2*b^2*\log(d*x + c)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3)) - 1/2*B^2*a*g*\log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3) - 1/2*(2*d*x + c)*A^2*b*g/(d^4*i^3*x^2 + 2*c*d^3*i$$

$$\sqrt[3]{x + c^2 d^2 i^3} - \frac{1}{2} \frac{A^2 a g}{(d^3 i^3 x^2 + 2 c d^2 i^3 x + c^2 d i^3)}$$

**Fricas [B]** time = 0.495467, size = 602, normalized size = 4.27

$$\frac{2 \left( (2A^2 - 2AB + B^2) b^2 c d - (2A^2 - 2AB + B^2) a b d^2 \right) g x - 2 \left( B^2 b^2 d^2 g x^2 + 2 B^2 a b d^2 g x + B^2 a^2 d^2 g \right) \log \left( \frac{b e x + a e}{d x + c} \right)^2 + (2A^2 - 2AB + B^2) b^2 c d^2}{4 \left( (b c d^4 - a d^5) i^3 x^2 + 2 \left( (2A^2 - 2AB + B^2) b^2 c d - (2A^2 - 2AB + B^2) a b d^2 \right) g x - 2 \left( B^2 b^2 d^2 g x^2 + 2 B^2 a b d^2 g x + B^2 a^2 d^2 g \right) \right)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i)^3,x, algorithm="fricas")

[Out] -1/4\*(2\*((2\*A^2 - 2\*A\*B + B^2)\*b^2\*c\*d - (2\*A^2 - 2\*A\*B + B^2)\*a\*b\*d^2)\*g\*x - 2\*(B^2\*b^2\*d^2\*g\*x^2 + 2\*B^2\*a\*b\*d^2\*g\*x + B^2\*a^2\*d^2\*g)\*log((b\*e\*x + a\*e)/(d\*x + c))^2 + ((2\*A^2 - 2\*A\*B + B^2)\*b^2\*c^2 - (2\*A^2 - 2\*A\*B + B^2)\*a^2\*d^2)\*g - 2\*((2\*A\*B - B^2)\*b^2\*d^2\*g\*x^2 + 2\*(2\*A\*B - B^2)\*a\*b\*d^2\*g\*x + (2\*A\*B - B^2)\*a^2\*d^2\*g)\*log((b\*e\*x + a\*e)/(d\*x + c)))/((b\*c\*d^4 - a\*d^5)\*i^3\*x^2 + 2\*(b\*c^2\*d^3 - a\*c\*d^4)\*i^3\*x + (b\*c^3\*d^2 - a\*c^2\*d^3)\*i^3)

**Sympy [B]** time = 14.2331, size = 712, normalized size = 5.05

$$\frac{B b^2 g (2A - B) \log \left( x + \frac{2ABab^2 dg + 2ABb^3 cg - B^2 ab^2 dg - B^2 b^3 cg - \frac{Ba^2 b^2 d^2 g (2A-B)}{ad-bc} + \frac{2Bab^3 cdg (2A-B)}{ad-bc} - \frac{Bb^4 c^2 g (2A-B)}{ad-bc}}{4ABb^3 dg - 2B^2 b^3 dg} \right)}{2d^2 i^3 (ad - bc)} - \frac{B b^2 g (2A - B) \log \left( x + \frac{2ABab^2 dg + 2ABb^3 cg - B^2 ab^2 dg - B^2 b^3 cg - \frac{Ba^2 b^2 d^2 g (2A-B)}{ad-bc} + \frac{2Bab^3 cdg (2A-B)}{ad-bc} - \frac{Bb^4 c^2 g (2A-B)}{ad-bc}}{4ABb^3 dg - 2B^2 b^3 dg} \right)}{2d^2 i^3 (ad - bc)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(A+B\*ln(e\*(b\*x+a)/(d\*x+c)))\*\*2/(d\*i\*x+c\*i)\*\*3,x)

[Out] B\*b\*\*2\*g\*(2\*A - B)\*log(x + (2\*A\*B\*a\*b\*\*2\*d\*g + 2\*A\*B\*b\*\*3\*c\*g - B\*\*2\*a\*b\*\*2\*d\*g - B\*\*2\*b\*\*3\*c\*g - B\*a\*\*2\*b\*\*2\*d\*\*2\*g\*(2\*A - B)/(a\*d - b\*c) + 2\*B\*a\*b\*\*3\*c\*d\*g\*(2\*A - B)/(a\*d - b\*c) - B\*b\*\*4\*c\*\*2\*g\*(2\*A - B)/(a\*d - b\*c))/(4\*A\*B\*b\*\*3\*d\*g - 2\*B\*\*2\*b\*\*3\*d\*g))/(2\*d\*\*2\*i\*\*3\*(a\*d - b\*c)) - B\*b\*\*2\*g\*(2\*A - B)\*log(x + (2\*A\*B\*a\*b\*\*2\*d\*g + 2\*A\*B\*b\*\*3\*c\*g - B\*\*2\*a\*b\*\*2\*d\*g - B\*\*2\*b\*\*3\*c\*g + B\*a\*\*2\*b\*\*2\*d\*\*2\*g\*(2\*A - B)/(a\*d - b\*c) - 2\*B\*a\*b\*\*3\*c\*d\*g\*(2\*A - B)/(a\*d - b\*c) + B\*b\*\*4\*c\*\*2\*g\*(2\*A - B)/(a\*d - b\*c))/(4\*A\*B\*b\*\*3\*d\*g - 2\*B\*\*2\*b\*\*3\*d\*g))/(2\*d\*\*2\*i\*\*3\*(a\*d - b\*c)) + (-B\*\*2\*a\*\*2\*g - 2\*B\*\*2\*a\*b\*g\*x - B\*\*2\*b\*\*2\*g\*x\*\*2)\*log(e\*(a + b\*x)/(c + d\*x))\*\*2/(2\*a\*c\*\*2\*d\*i\*\*3 + 4\*a\*c\*d\*\*2)

```

2*i**3*x + 2*a*d**3*i**3*x**2 - 2*b*c**3*i**3 - 4*b*c**2*d*i**3*x - 2*b*c*d
**2*i**3*x**2) - (2*A**2*a*d*g + 2*A**2*b*c*g - 2*A*B*a*d*g - 2*A*B*b*c*g +
B**2*a*d*g + B**2*b*c*g + x*(4*A**2*b*d*g - 4*A*B*b*d*g + 2*B**2*b*d*g))/(
4*c**2*d**2*i**3 + 8*c*d**3*i**3*x + 4*d**4*i**3*x**2) + (-2*A*B*a*d*g - 2*
A*B*b*c*g - 4*A*B*b*d*g*x + B**2*a*d*g + B**2*b*c*g + 2*B**2*b*d*g*x)*log(e
*(a + b*x)/(c + d*x))/(2*c**2*d**2*i**3 + 4*c*d**3*i**3*x + 2*d**4*i**3*x**
2)

```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag) \left( B \log\left(\frac{bx+a}{dx+c}\right) + A \right)^2}{(dix + ci)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```

[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x, algor
ithm="giac")

```

```

[Out] integrate((b*g*x + a*g)*(B*log((b*x + a)*e/(d*x + c)) + A)^2/(d*i*x + c*i)^
3, x)

```

$$3.103 \quad \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ci+dx)^3} dx$$

**Optimal.** Leaf size=296

$$\frac{Bd(a+bx)^2 \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{2i^3(c+dx)^2(bc-ad)^2} + \frac{b(a+bx) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)^2}{i^3(c+dx)(bc-ad)^2} - \frac{d(a+bx)^2 \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)^2}{2i^3(c+dx)^2(bc-ad)^2} - \frac{2AbB(a+bx)}{i^3(c+dx)(bc-ad)}$$

[Out]  $-(B^2 d (a + b x)^2) / (4 (b c - a d)^2 i^3 (c + d x)^2) - (2 A b B (a + b x)) / ((b c - a d)^2 i^3 (c + d x)) + (2 b B^2 (a + b x)) / ((b c - a d)^2 i^3 (c + d x)) - (2 b B^2 (a + b x) \text{Log}[(e (a + b x)) / (c + d x)]) / ((b c - a d)^2 i^3 (c + d x)) + (B d (a + b x)^2 (A + B \text{Log}[(e (a + b x)) / (c + d x)])) / (2 (b c - a d)^2 i^3 (c + d x)^2) - (d (a + b x)^2 (A + B \text{Log}[(e (a + b x)) / (c + d x)]))^2 / (2 (b c - a d)^2 i^3 (c + d x)^2) + (b (a + b x) (A + B \text{Log}[(e (a + b x)) / (c + d x)]))^2 / ((b c - a d)^2 i^3 (c + d x))$

**Rubi [C]** time = 0.913585, antiderivative size = 577, normalized size of antiderivative = 1.95, number of steps used = 30, number of rules used = 11, integrand size = 32,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.344$ , Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 44}

$$\frac{b^2 B^2 \text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{di^3(bc-ad)^2} + \frac{b^2 B^2 \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{di^3(bc-ad)^2} + \frac{b^2 B \log(a+bx) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{di^3(bc-ad)^2} - \frac{b^2 B \log(c+dx) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{di^3(bc-ad)^2}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))^2/(c\*i + d\*i\*x)^3,x]

[Out]  $-B^2 / (4 d i^3 (c + d x)^2) - (3 b B^2) / (2 d (b c - a d) i^3 (c + d x)) - (3 b^2 B^2 \text{Log}[a + b x]) / (2 d (b c - a d)^2 i^3) - (b^2 B^2 \text{Log}[a + b x]^2) / (2 d (b c - a d)^2 i^3) + (B (A + B \text{Log}[(e (a + b x)) / (c + d x)])) / (2 d i^3 (c + d x)^2) + (b B (A + B \text{Log}[(e (a + b x)) / (c + d x)])) / (d (b c - a d) i^3 (c + d x)) + (b^2 B \text{Log}[a + b x] (A + B \text{Log}[(e (a + b x)) / (c + d x)])) / (d (b c - a d)^2 i^3) - (A + B \text{Log}[(e (a + b x)) / (c + d x)])^2 / (2 d i^3 (c + d x)^2) + (3 b^2 B^2 \text{Log}[c + d x]) / (2 d (b c - a d)^2 i^3) + (b^2 B^2 \text{Log}[-((d (a + b x)) / (b c - a d))] \text{Log}[c + d x]) / (d (b c - a d)^2 i^3) - (b^2 B (A + B \text{Log}[(e (a + b x)) / (c + d x)] \text{Log}[c + d x]) / (d (b c - a d)^2 i^3) - (b^2 B^2 \text{Log}[c + d x]^2) / (2 d (b c - a d)^2 i^3) + (b^2 B^2 \text{Log}[a + b x] \text{Log}[(b (c + d x)) / (b c - a d)]) / (d (b c - a d)^2 i^3) + (b^2 B^2 \text{PolyLog}[2, -(d (a + b x)) / (b c - a d)]) / (d (b c - a d)^2 i^3) + (b^2 B^2 \text{PolyLog}[2, (b$

$(c + dx)/(b^2c - a^2d) / (d(b^2c - a^2d)^{2i-3})$

### Rule 2525

Int[((a\_.) + Log[(c\_.)\*(RFX\_)^(p\_.)]\*(b\_.))^(n\_.)\*((d\_.) + (e\_.)\*(x\_))^(m\_.), x\_Symbol] := Simp[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFX^p])^n)/(e\*(m + 1)), x] - Dist[(b\*n\*p)/(e\*(m + 1)), Int[SimplifyIntegrand[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFX^p])^(n - 1)\*D[RFX, x])/RFX, x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

### Rule 12

Int[(a\_)\*(u\_), x\_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b\_)\*(v\_) /; FreeQ[b, x]]

### Rule 2528

Int[((a\_.) + Log[(c\_.)\*(RFX\_)^(p\_.)]\*(b\_.))^(n\_.)\*(RGx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*RFX^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFX, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

### Rule 2524

Int[((a\_.) + Log[(c\_.)\*(RFX\_)^(p\_.)]\*(b\_.))^(n\_.)/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[d + e\*x]\*(a + b\*Log[c\*RFX^p])^n)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[d + e\*x]\*(a + b\*Log[c\*RFX^p])^(n - 1)\*D[RFX, x])/RFX, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0]

### Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*(RFX\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n])^p, RFX, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFX, x] && IntegerQ[p]

### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.)\*(x\_))^(q\_.), x\_Symbol] := Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_)^(m_.))*((c_.) + (d_.)*(x_)^(n_.)), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(103c + 103dx)^3} dx &= -\frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2185454d(c+dx)^2} + \frac{B \int \frac{(bc-ad)\left(A+B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{10609(a+bx)(c+dx)^3} dx}{103d} \\
&= -\frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2185454d(c+dx)^2} + \frac{(B(bc-ad)) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)(c+dx)^3} dx}{1092727d} \\
&= -\frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2185454d(c+dx)^2} + \frac{(B(bc-ad)) \int \left(\frac{b^3\left(A+B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)^3(a+bx)} - \frac{d\left(A+B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)(c+dx)^3} - \frac{bd\left(A+B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)^2}\right) dx}{1092727d} \\
&= -\frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2185454d(c+dx)^2} - \frac{B \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{(c+dx)^3} dx}{1092727} - \frac{(b^2B) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx} dx}{1092727(bc-ad)^2} + \frac{(b^3B) \int \frac{A+B \log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx} dx}{1092727} \\
&= \frac{B\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2185454d(c+dx)^2} + \frac{bB\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1092727d(bc-ad)(c+dx)} + \frac{b^2B \log(a+bx)\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1092727d(bc-ad)^2} \\
&= \frac{B\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2185454d(c+dx)^2} + \frac{bB\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1092727d(bc-ad)(c+dx)} + \frac{b^2B \log(a+bx)\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1092727d(bc-ad)^2} \\
&= \frac{B\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2185454d(c+dx)^2} + \frac{bB\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1092727d(bc-ad)(c+dx)} + \frac{b^2B \log(a+bx)\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1092727d(bc-ad)^2} \\
&= -\frac{B^2}{4370908d(c+dx)^2} - \frac{3bB^2}{2185454d(bc-ad)(c+dx)} - \frac{3b^2B^2 \log(a+bx)}{2185454d(bc-ad)^2} + \frac{B\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2185454d} \\
&= -\frac{B^2}{4370908d(c+dx)^2} - \frac{3bB^2}{2185454d(bc-ad)(c+dx)} - \frac{3b^2B^2 \log(a+bx)}{2185454d(bc-ad)^2} + \frac{B\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2185454d} \\
&= -\frac{B^2}{4370908d(c+dx)^2} - \frac{3bB^2}{2185454d(bc-ad)(c+dx)} - \frac{3b^2B^2 \log(a+bx)}{2185454d(bc-ad)^2} - \frac{b^2B^2 \log^2(a+bx)}{2185454d} \\
&= -\frac{B^2}{4370908d(c+dx)^2} - \frac{3bB^2}{2185454d(bc-ad)(c+dx)} - \frac{3b^2B^2 \log(a+bx)}{2185454d(bc-ad)^2} - \frac{b^2B^2 \log^2(a+bx)}{2185454d}
\end{aligned}$$

**Mathematica [C]** time = 0.44917, size = 444, normalized size = 1.5

$$\frac{B\left(-2b^2B(c+dx)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+2b^2B(c+dx)^2\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)\right)}{4370908d(c+dx)^2 - 2185454d(bc-ad)(c+dx) - 2185454d(bc-ad)^2 - 2185454d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x]))^2/(c*i + d*i*x)^3,x]
```

```
[Out] (-2*(A + B*Log[(e*(a + b*x))/(c + d*x]))^2 + (B*(2*(b*c - a*d)^2*(A + B*Log
[(e*(a + b*x))/(c + d*x])) + 4*b*(b*c - a*d)*(c + d*x)*(A + B*Log[(e*(a + b
*x))/(c + d*x])) + 4*b^2*(c + d*x)^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/
(c + d*x)]) - 4*b^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c
+ d*x] - 4*b*B*(c + d*x)*(b*c - a*d + b*(c + d*x)*Log[a + b*x] - b*(c + d*x
)*Log[c + d*x]) - B*((b*c - a*d)^2 + 2*b*(b*c - a*d)*(c + d*x) + 2*b^2*(c +
d*x)^2*Log[a + b*x] - 2*b^2*(c + d*x)^2*Log[c + d*x]) - 2*b^2*B*(c + d*x)^
2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyL
og[2, (d*(a + b*x))/(-b*c) + a*d]) + 2*b^2*B*(c + d*x)^2*((2*Log[(d*(a +
b*x))/(-b*c) + a*d]) - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d
*x))/(b*c - a*d)])))/(b*c - a*d)^2)/(4*d*i^3*(c + d*x)^2)
```

---

**Maple [B]** time = 0.055, size = 1917, normalized size = 6.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(d*i*x+c*i)^3,x)
```

```
[Out] -1/2*d^2/(a*d-b*c)^3/i^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)^2*a^
3-3/(a*d-b*c)^3/i^3*B^2*b^2/(d*x+c)*c*a-1/2/d/(a*d-b*c)^3/i^3*B^2*ln(b*e/d+
(a*d-b*c)*e/d/(d*x+c))^2*b^3*c+1/(a*d-b*c)^3/i^3*A*B*ln(b*e/d+(a*d-b*c)*e/d
/(d*x+c))*b^2*a+1/4/d/(a*d-b*c)^3/i^3*B^2/(d*x+c)^2*b^3*c^3+1/2*d^2/(a*d-b*
c)^3/i^3*A*B/(d*x+c)^2*a^3-3/(a*d-b*c)^3/i^3*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*
x+c))/(d*x+c)^2*a*b^2*c^2+1/d/(a*d-b*c)^3/i^3*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d
*x+c))/(d*x+c)^2*b^3*c^3+1/2/(a*d-b*c)^3/i^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*
x+c))^2*b^2*a-3/2/(a*d-b*c)^3/i^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*a
-1/4*d^2/(a*d-b*c)^3/i^3*B^2/(d*x+c)^2*a^3-1/2*d^2/(a*d-b*c)^3/i^3*A^2/(d*x
+c)^2*a^3+3/2/d/(a*d-b*c)^3/i^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3*c+1
/2*d^2/(a*d-b*c)^3/i^3*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^3-1/
2/d/(a*d-b*c)^3/i^3*A^2*b^3*c+7/4/(a*d-b*c)^3/i^3*B^2*b^2*a-7/4/d/(a*d-b*c)
^3/i^3*B^2*b^3*c+1/2/(a*d-b*c)^3/i^3*A^2*b^2*a+3/2*d/(a*d-b*c)^3/i^3*B^2*ln
(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)^2*a^2*b*c-3/2*d/(a*d-b*c)^3/i^3*B^2
*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^2*b*c-3/2*d/(a*d-b*c)^3/i^3*A*
B/(d*x+c)^2*a^2*b*c+3*d/(a*d-b*c)^3/i^3*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))
/(d*x+c)^2*a^2*b*c+3/2*d/(a*d-b*c)^3/i^3*A^2/(d*x+c)^2*a^2*b*c+2/(a*d-b*c)^
3/i^3*A*B*b^2/(d*x+c)*a*c+3/2/(a*d-b*c)^3/i^3*A*B/(d*x+c)^2*b^2*c^2*a-1/d/(
```



$$\begin{aligned}
& a*d-b*c)^3/i^3*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3/(d*x+c)*c^2-1/d/(a*d \\
& -b*c)^3/i^3*A*B*b^3/(d*x+c)*c^2+1/2/d/(a*d-b*c)^3/i^3*A^2/(d*x+c)^2*b^3*c^3 \\
& +3/2*d/(a*d-b*c)^3/i^3*B^2*b/(d*x+c)*a^2+3/2/d/(a*d-b*c)^3/i^3*B^2*b^3/(d*x \\
& +c)*c^2-3/2/(a*d-b*c)^3/i^3*A^2/(d*x+c)^2*b^2*c^2*a-3/4/(a*d-b*c)^3/i^3*B^2 \\
& /(d*x+c)^2*b^2*c^2*a+2/(a*d-b*c)^3/i^3*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))* \\
& b^2/(d*x+c)*a*c-d^2/(a*d-b*c)^3/i^3*A*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d* \\
& x+c)^2*a^3-1/d/(a*d-b*c)^3/i^3*A*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3*c-d/ \\
& (a*d-b*c)^3/i^3*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b/(d*x+c)*a^2-3/2/(a*d- \\
& b*c)^3/i^3*A*B*b^2*a+3/2/d/(a*d-b*c)^3/i^3*A*B*b^3*c+1/2/d/(a*d-b*c)^3/i^3* \\
& B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)^2*b^3*c^3+3/2/(a*d-b*c)^3/i^3 \\
& *B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*b^2*c^2*a-3/2/(a*d-b*c)^3/i^ \\
& 3*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)^2*b^2*c^2*a-1/2/d/(a*d-b*c) \\
& ^3/i^3*A*B/(d*x+c)^2*b^3*c^3-d/(a*d-b*c)^3/i^3*A*B*b/(d*x+c)*a^2+3/4*d/(a*d \\
& -b*c)^3/i^3*B^2/(d*x+c)^2*a^2*b*c-1/2/d/(a*d-b*c)^3/i^3*B^2*\ln(b*e/d+(a*d-b \\
& *c)*e/d/(d*x+c))/(d*x+c)^2*b^3*c^3
\end{aligned}$$

**Maxima [B]** time = 1.55489, size = 1145, normalized size = 3.87

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i)^3,x, algorithm="maxima")

[Out] 
$$\begin{aligned}
& 1/4*(2*((2*b*d*x + 3*b*c - a*d)/((b*c*d^3 - a*d^4)*i^3*x^2 + 2*(b*c^2*d^2 - \\
& a*c*d^3)*i^3*x + (b*c^3*d - a*c^2*d^2)*i^3) + 2*b^2*\log(b*x + a)/((b^2*c^2 \\
& *d - 2*a*b*c*d^2 + a^2*d^3)*i^3) - 2*b^2*\log(d*x + c)/((b^2*c^2*d - 2*a*b*c \\
& *d^2 + a^2*d^3)*i^3))*\log(b*e*x/(d*x + c) + a*e/(d*x + c)) - (7*b^2*c^2 - 8 \\
& *a*b*c*d + a^2*d^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*\log(b*x + a)^2 \\
& + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*\log(d*x + c)^2 + 6*(b^2*c*d - a* \\
& b*d^2)*x + 6*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*\log(b*x + a) - 2*(3*b^2* \\
& d^2*x^2 + 6*b^2*c*d*x + 3*b^2*c^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2) \\
& *\log(b*x + a))*\log(d*x + c))/(b^2*c^4*d*i^3 - 2*a*b*c^3*d^2*i^3 + a^2*c^2*d \\
& ^3*i^3 + (b^2*c^2*d^3*i^3 - 2*a*b*c*d^4*i^3 + a^2*d^5*i^3)*x^2 + 2*(b^2*c^3 \\
& *d^2*i^3 - 2*a*b*c^2*d^3*i^3 + a^2*c*d^4*i^3)*x))*B^2 + 1/2*A*B*((2*b*d*x + \\
& 3*b*c - a*d)/((b*c*d^3 - a*d^4)*i^3*x^2 + 2*(b*c^2*d^2 - a*c*d^3)*i^3*x + \\
& (b*c^3*d - a*c^2*d^2)*i^3) - 2*\log(b*e*x/(d*x + c) + a*e/(d*x + c))/(d^3*i^ \\
& 3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3) + 2*b^2*\log(b*x + a)/((b^2*c^2*d - 2*a*b \\
& *c*d^2 + a^2*d^3)*i^3) - 2*b^2*\log(d*x + c)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2 \\
& *d^3)*i^3)) - 1/2*B^2*\log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(d^3*i^3*x^2 + \\
& 2*c*d^2*i^3*x + c^2*d*i^3) - 1/2*A^2/(d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*
\end{aligned}$$

$i^3$ )

---

**Fricas [A]** time = 0.516859, size = 767, normalized size = 2.59

$$\frac{(2A^2 - 6AB + 7B^2)b^2c^2 - 4(A^2 - 2AB + 2B^2)abcd + (2A^2 - 2AB + B^2)a^2d^2 - 2(B^2b^2d^2x^2 + 2B^2b^2cdx + 2B^2abcd)}{4((b^2c^2d^3 - 2abcd$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i)^3,x, algorithm="fricas")

[Out]  $-1/4*((2*A^2 - 6*A*B + 7*B^2)*b^2*c^2 - 4*(A^2 - 2*A*B + 2*B^2)*a*b*c*d + (2*A^2 - 2*A*B + B^2)*a^2*d^2 - 2*(B^2*b^2*d^2*x^2 + 2*B^2*b^2*c*d*x + 2*B^2*a*b*c*d - B^2*a^2*d^2)*\log((b*e*x + a*e)/(d*x + c))^2 - 2*((2*A*B - 3*B^2)*b^2*c*d - (2*A*B - 3*B^2)*a*b*d^2)*x - 2*((2*A*B - 3*B^2)*b^2*d^2*x^2 + 4*(A*B - B^2)*a*b*c*d - (2*A*B - B^2)*a^2*d^2 - 2*(B^2*a*b*d^2 - 2*(A*B - B^2)*b^2*c*d)*x)*\log((b*e*x + a*e)/(d*x + c)))/((b^2*c^2*d^3 - 2*a*b*c*d^4 + a^2*d^5)*i^3*x^2 + 2*(b^2*c^3*d^2 - 2*a*b*c^2*d^3 + a^2*c*d^4)*i^3*x + (b^2*c^4*d - 2*a*b*c^3*d^2 + a^2*c^2*d^3)*i^3)$

---

**Sympy [B]** time = 6.61356, size = 892, normalized size = 3.01

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*(b\*x+a)/(d\*x+c)))\*\*2/(d\*i\*x+c\*i)\*\*3,x)

[Out]  $-B*b**2*(2*A - 3*B)*\log(x + (2*A*B*a*b**2*d + 2*A*B*b**3*c - 3*B**2*a*b**2*d - 3*B**2*b**3*c - B*a**3*b**2*d**3*(2*A - 3*B))/(a*d - b*c)**2 + 3*B*a**2*b**3*c*d**2*(2*A - 3*B))/(a*d - b*c)**2 - 3*B*a*b**4*c**2*d*(2*A - 3*B)/(a*d - b*c)**2 + B*b**5*c**3*(2*A - 3*B)/(a*d - b*c)**2)/(4*A*B*b**3*d - 6*B**2*b**3*d))/(2*d*i**3*(a*d - b*c)**2) + B*b**2*(2*A - 3*B)*\log(x + (2*A*B*a*b**2*d + 2*A*B*b**3*c - 3*B**2*a*b**2*d - 3*B**2*b**3*c + B*a**3*b**2*d**3*(2*A - 3*B))/(a*d - b*c)**2 - 3*B*a**2*b**3*c*d**2*(2*A - 3*B))/(a*d - b*c)**2 + 3*B*a*b**4*c**2*d*(2*A - 3*B)/(a*d - b*c)**2 - B*b**5*c**3*(2*A - 3*B)/(a*d - b*c)**2)/(4*A*B*b**3*d - 6*B**2*b**3*d))/(2*d*i**3*(a*d - b*c)**2) +$

```
(-B**2*a**2*d + 2*B**2*a*b*c + 2*B**2*b**2*c*x + B**2*b**2*d*x**2)*log(e*(a
+ b*x)/(c + d*x))**2/(2*a**2*c**2*d**2*i**3 + 4*a**2*c*d**3*i**3*x + 2*a**
2*d**4*i**3*x**2 - 4*a*b*c**3*d*i**3 - 8*a*b*c**2*d**2*i**3*x - 4*a*b*c*d**
3*i**3*x**2 + 2*b**2*c**4*i**3 + 4*b**2*c**3*d*i**3*x + 2*b**2*c**2*d**2*i
*3*x**2) + (-2*A*B*a*d + 2*A*B*b*c + B**2*a*d - 3*B**2*b*c - 2*B**2*b*d*x)*
log(e*(a + b*x)/(c + d*x))/(2*a*c**2*d**2*i**3 + 4*a*c*d**3*i**3*x + 2*a*d
*4*i**3*x**2 - 2*b*c**3*d*i**3 - 4*b*c**2*d**2*i**3*x - 2*b*c*d**3*i**3*x**
2) - (2*A**2*a*d - 2*A**2*b*c - 2*A*B*a*d + 6*A*B*b*c + B**2*a*d - 7*B**2*b
*c + x*(4*A*B*b*d - 6*B**2*b*d))/(4*a*c**2*d**2*i**3 - 4*b*c**3*d*i**3 + x
*2*(4*a*d**4*i**3 - 4*b*c*d**3*i**3) + x*(8*a*c*d**3*i**3 - 8*b*c**2*d**2*i
**3))
```

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B \log\left(\frac{bx+a}{dx+c}\right) + A\right)^2}{(dix + ci)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(d\*i\*x+c\*i)^3,x, algorithm="giac")

[Out] integrate((B\*log((b\*x + a)\*e/(d\*x + c)) + A)^2/(d\*i\*x + c\*i)^3, x)

$$3.104 \quad \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)(ci+dx)^3} dx$$

**Optimal.** Leaf size=375

$$\frac{b^2 \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)^3}{3Bgi^3(bc-ad)^3} + \frac{d^2(a+bx)^2 \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)^2}{2gi^3(c+dx)^2(bc-ad)^3} - \frac{Bd^2(a+bx)^2 \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{2gi^3(c+dx)^2(bc-ad)^3} - \frac{2bd(a+bx) \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{gi^3(c+dx)^2}$$

[Out] (B^2\*d^2\*(a + b\*x)^2)/(4\*(b\*c - a\*d)^3\*g\*i^3\*(c + d\*x)^2) + (4\*A\*b\*B\*d\*(a + b\*x))/((b\*c - a\*d)^3\*g\*i^3\*(c + d\*x)) - (4\*b\*B^2\*d\*(a + b\*x))/((b\*c - a\*d)^3\*g\*i^3\*(c + d\*x)) + (4\*b\*B^2\*d\*(a + b\*x)\*Log[(e\*(a + b\*x))/(c + d\*x)])/((b\*c - a\*d)^3\*g\*i^3\*(c + d\*x)) - (B\*d^2\*(a + b\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(2\*(b\*c - a\*d)^3\*g\*i^3\*(c + d\*x)^2) + (d^2\*(a + b\*x)^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]^2)/(2\*(b\*c - a\*d)^3\*g\*i^3\*(c + d\*x)^2) - (2\*b\*d\*(a + b\*x)\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]^2)/((b\*c - a\*d)^3\*g\*i^3\*(c + d\*x)) + (b^2\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]^3)/(3\*B\*(b\*c - a\*d)^3\*g\*i^3))

**Rubi [C]** time = 7.36519, antiderivative size = 1899, normalized size of antiderivative = 5.06, number of steps used = 117, number of rules used = 31, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}}$  = 0.738, Rules used = {2528, 2524, 12, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2525, 44, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2/((a\*g + b\*g\*x)\*(c\*i + d\*i\*x)^3), x]

[Out] B^2/(4\*(b\*c - a\*d)\*g\*i^3\*(c + d\*x)^2) + (7\*b\*B^2)/(2\*(b\*c - a\*d)^2\*g\*i^3\*(c + d\*x)) + (7\*b^2\*B^2\*Log[a + b\*x])/((b\*c - a\*d)^3\*g\*i^3) - (A\*b^2\*B\*Log[a + b\*x]^2)/((b\*c - a\*d)^3\*g\*i^3) + (3\*b^2\*B^2\*Log[a + b\*x]^2)/(2\*(b\*c - a\*d)^3\*g\*i^3) + (b^2\*B^2\*Log[a + b\*x]\*Log[(c + d\*x)^(-1)]^2)/((b\*c - a\*d)^3\*g\*i^3) - (b^2\*B^2\*Log[-((d\*(a + b\*x))/(b\*c - a\*d))]\*Log[(c + d\*x)^(-1)]^2)/((b\*c - a\*d)^3\*g\*i^3) - (b^2\*B^2\*Log[-((b\*c - a\*d)/(d\*(a + b\*x))])\*Log[(e\*(a + b\*x))/(c + d\*x)]^2)/((b\*c - a\*d)^3\*g\*i^3) - (b^2\*B^2\*Log[a + b\*x]\*Log[(e\*(a + b\*x))/(c + d\*x)]^2)/((b\*c - a\*d)^3\*g\*i^3) - (B\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(2\*(b\*c - a\*d)\*g\*i^3\*(c + d\*x)^2) - (3\*b\*B\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(2\*(b\*c - a\*d)\*g\*i^3\*(c + d\*x)^2) - (3\*b\*B\*(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)]))/(2\*(b\*c - a\*d)\*g\*i^3\*(c + d\*x)^2)

$$\begin{aligned}
& + b*x))/(c + d*x)))/((b*c - a*d)^2*g*i^3*(c + d*x)) - (3*b^2*B*Log[a + b*x] \\
& *(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^3*g*i^3) + (A + B*Log \\
& [(e*(a + b*x))/(c + d*x)]^2/(2*(b*c - a*d)*g*i^3*(c + d*x)^2) + (b*(A + B* \\
& Log[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^2*g*i^3*(c + d*x)) + (b^2*Log \\
& [a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^3*g*i^3) - ( \\
& 7*b^2*B^2*Log[c + d*x])/(2*(b*c - a*d)^3*g*i^3) + (b^2*B^2*Log[a + b*x]^2*L \\
& og[c + d*x])/((b*c - a*d)^3*g*i^3) + (2*A*b^2*B*Log[-((d*(a + b*x))/(b*c - \\
& a*d))]*Log[c + d*x])/((b*c - a*d)^3*g*i^3) - (3*b^2*B^2*Log[-((d*(a + b*x)) \\
& / (b*c - a*d))] * Log[c + d*x])/((b*c - a*d)^3*g*i^3) + (2*b^2*B^2*Log[a + b*x] \\
& * Log[(c + d*x)^(-1)] * Log[c + d*x])/((b*c - a*d)^3*g*i^3) - (2*b^2*B^2*Log[ \\
& -((d*(a + b*x))/(b*c - a*d))] * (Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e \\
& (a + b*x))/(c + d*x)]) * Log[c + d*x])/((b*c - a*d)^3*g*i^3) + (3*b^2*B*(A + \\
& B*Log[(e*(a + b*x))/(c + d*x)]) * Log[c + d*x])/((b*c - a*d)^3*g*i^3) - (b^2* \\
& (A + B*Log[(e*(a + b*x))/(c + d*x)]^2 * Log[c + d*x])/((b*c - a*d)^3*g*i^3) \\
& - (A*b^2*B*Log[c + d*x]^2)/((b*c - a*d)^3*g*i^3) + (3*b^2*B^2*Log[c + d*x]^ \\
& 2)/(2*(b*c - a*d)^3*g*i^3) + (b^2*B^2*Log[a + b*x]*Log[c + d*x]^2)/((b*c - \\
& a*d)^3*g*i^3) - (b^2*B^2*Log[(e*(a + b*x))/(c + d*x)] * Log[c + d*x]^2)/((b*c \\
& - a*d)^3*g*i^3) - (b^2*B^2*Log[c + d*x]^3)/(3*(b*c - a*d)^3*g*i^3) + (2*A* \\
& b^2*B*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g*i^3) - \\
& (3*b^2*B^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g*i^ \\
& 3) - (b^2*B^2*Log[a + b*x]^2 * Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3 \\
& *g*i^3) + (2*A*b^2*B*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d) \\
& ^3*g*i^3) - (3*b^2*B^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a* \\
& d)^3*g*i^3) - (2*b^2*B^2*Log[a + b*x]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d \\
& ))])/((b*c - a*d)^3*g*i^3) + (2*A*b^2*B*PolyLog[2, (b*(c + d*x))/(b*c - a*d \\
& )])/((b*c - a*d)^3*g*i^3) - (3*b^2*B^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d \\
& )])/((b*c - a*d)^3*g*i^3) + (2*b^2*B^2*Log[(c + d*x)^(-1)] * PolyLog[2, (b*(c \\
& + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g*i^3) - (2*b^2*B^2*(Log[a + b*x] + Lo \\
& g[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)]) * PolyLog[2, (b*(c + d*x))/ \\
& (b*c - a*d)])/((b*c - a*d)^3*g*i^3) + (2*b^2*B^2*Log[(e*(a + b*x))/(c + d*x \\
& )]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^3*g*i^3) + (2*b^ \\
& 2*B^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^3*g*i^3) + (2* \\
& b^2*B^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g*i^3) + (2*b \\
& ^2*B^2*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^3*g*i^3)
\end{aligned}$$

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]

```

### Rule 2524

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S

```

```

symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

```

### Rule 12

```

Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]

```

### Rule 2418

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^p*(RFx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]

```

### Rule 2390

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^p*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]

```

### Rule 2301

```

Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]

```

### Rule 2394

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x
), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]

```

### Rule 2393

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]

```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rule 6688

```
Int[u_, x_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifyIntegrandQ[v, u, x]]
```

### Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]
```

### Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]*(b_.))^(p_.)*((f_.) + (g_.)*(x_)^(q_.))*((h_.) + (i_.)*(x_)^(r_.)), x_Symbol] := Dist[1/e, Subst[Int[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

### Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_Symbol] := Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]
```

### Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol] := Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e, Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]
```

### Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_)^(p_.))*((c_.) + (d_.)*(x_)^(q_.))^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_)^(t_.))^(u_.))*(v_.), x_Symbol] := With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g + h*x)^t]^u)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s + 1))/(p*r*(s + 1)*(b*c - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
```

EqQ[p + q, 0] && NeQ[s, -1]

### Rule 2488

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.)/((g\_.) + (h\_.)\*(x\_)), x\_Symbol] := -Simp[(Log[-((b\*c - a\*d)/(d\*(a + b\*x)))]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/h, x] + Dist[(p\*r\*s\*(b\*c - a\*d))/h, Int[(Log[-((b\*c - a\*d)/(d\*(a + b\*x)))]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1))/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && EqQ[b\*g - a\*h, 0] && IGtQ[s, 0]

### Rule 2506

Int[Log[v\_]\*Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.)\*(u\_), x\_Symbol] := With[{g = Simplify[((v - 1)\*(c + d\*x))/(a + b\*x)], h = Simplify[u\*(a + b\*x)\*(c + d\*x)]}, -Simp[(h\*PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/(b\*c - a\*d), x] + Dist[h\*p\*r\*s, Int[(PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1))/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]

### Rule 6610

Int[(u\_)\*PolyLog[n\_, v\_], x\_Symbol] := With[{w = DerivativeDivides[v, u\*v, x]}, Simp[w\*PolyLog[n + 1, v], x] /; !FalseQ[w]] /; FreeQ[n, x]

### Rule 2525

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*((d\_.) + (e\_.)\*(x\_))^(m\_.), x\_Symbol] := Simp[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^n)/(e\*(m + 1)), x] - Dist[(b\*n\*p)/(e\*(m + 1)), Int[SimplifyIntegrand[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

### Rule 44

Int[((a\_.) + (b\_.)\*(x\_))^(m\_.)\*((c\_.) + (d\_.)\*(x\_))^(n\_.), x\_Symbol] := Int[ExpandIntegrand[(a + b\*x)^m\*(c + d\*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b\*c - a\*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])

### Rule 2500



```

Int[(Log[(e_.)*((f_.)*(a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^((r_.))*((s_.) + Log[(i_.)*(g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] := Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]

```

### Rule 2433

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] := Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*1, 0]

```

### Rule 2375

```

Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*(a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] := Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]

```

### Rule 2374

```

Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] := -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]

```

### Rule 6589

```

Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]

```

### Rule 2440

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Symbol] :=
Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*1)/l) + (e*x)/l)^n]*(f +
g*Log[h*(-((j*k - i*1)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,

```

b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]

### Rule 2434

Int[(((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))\*((f\_.) + Log[(h\_.)\*((i\_.) + (j\_.)\*(x\_))^(m\_.)]\*(g\_.)))/(x\_), x\_Symbol] :> Simp[Log[x]\*(a + b\*Log[c\*(d + e\*x)^n])\*(f + g\*Log[h\*(i + j\*x)^m]), x] + (-Dist[e\*g\*m, Int[(Log[x]\*(a + b\*Log[c\*(d + e\*x)^n])]/(d + e\*x), x], x] - Dist[b\*j\*n, Int[(Log[x]\*(f + g\*Log[h\*(i + j\*x)^m])]/(i + j\*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, m, n}, x] && EqQ[e\*i - d\*j, 0]

### Rule 2499

Int[(Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^r)]\*(s\_.) + Log[(i\_.)\*((g\_.) + (h\_.)\*(x\_))^(n\_.)]\*(t\_.))^(m\_.))/((j\_.) + (k\_.)\*(x\_)), x\_Symbol] :> Simp[((s + t\*Log[i\*(g + h\*x)^n])^(m + 1)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r)]/(k\*n\*t\*(m + 1)), x] + (-Dist[(b\*p\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(a + b\*x), x], x] - Dist[(d\*q\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(c + d\*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0] && EqQ[h\*j - g\*k, 0] && IGtQ[m, 0]

### Rule 2396

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :> Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])^p)/g, x] - Dist[(b\*e\*n\*p)/g, Int[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])^(p - 1)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p}, x] && NeQ[e\*f - d\*g, 0] && IGtQ[p, 1]

### Rule 2302

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_))/(x\_), x\_Symbol] :> Dist[1/(b\*n), Subst[Int[x^p, x], x, a + b\*Log[c\*x^n]], x] /; FreeQ[{a, b, c, n, p}, x]

### Rule 30

Int[(x\_)^(m\_.), x\_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && NeQ[m, -1]

### Rubi steps

$$\begin{aligned}
\int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(104c + 104dx)^3(ag + bgx)} dx &= \int \left( \frac{b^3 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1124864(bc - ad)^3g(a + bx)} - \frac{d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1124864(bc - ad)g(c + dx)^3} - \frac{bd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1124864(bc - ad)} \right) dx \\
&= \frac{b^3 \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx} dx}{1124864(bc - ad)^3g} - \frac{(b^2d) \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx} dx}{1124864(bc - ad)^3g} - \frac{(bd) \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(c+dx)^2} dx}{1124864(bc - ad)^2g} \\
&= \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2249728(bc - ad)g(c + dx)^2} + \frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1124864(bc - ad)^2g(c + dx)} + \frac{b^2 \log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1124864(bc - ad)} \\
&= \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2249728(bc - ad)g(c + dx)^2} + \frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1124864(bc - ad)^2g(c + dx)} + \frac{b^2 \log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1124864(bc - ad)} \\
&= \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2249728(bc - ad)g(c + dx)^2} + \frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1124864(bc - ad)^2g(c + dx)} + \frac{b^2 \log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1124864(bc - ad)} \\
&= \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2249728(bc - ad)g(c + dx)^2} + \frac{b \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1124864(bc - ad)^2g(c + dx)} + \frac{b^2 \log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1124864(bc - ad)} \\
&= -\frac{B \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2249728(bc - ad)g(c + dx)^2} - \frac{3bB \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1124864(bc - ad)^2g(c + dx)} - \frac{3b^2B \log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1124864(bc - ad)} \\
&= -\frac{B \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2249728(bc - ad)g(c + dx)^2} - \frac{3bB \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1124864(bc - ad)^2g(c + dx)} - \frac{3b^2B \log(a + bx) \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1124864(bc - ad)} \\
&= -\frac{b^2B^2 \log(a + bx) \log^2\left(\frac{e(a+bx)}{c+dx}\right)}{1124864(bc - ad)^3g} - \frac{B \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2249728(bc - ad)g(c + dx)^2} - \frac{3bB \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1124864(bc - ad)} \\
&= \frac{B^2}{4499456(bc - ad)g(c + dx)^2} + \frac{7bB^2}{2249728(bc - ad)^2g(c + dx)} + \frac{7b^2B^2 \log(a + bx)}{2249728(bc - ad)^3g} \\
&= \frac{B^2}{4499456(bc - ad)g(c + dx)^2} + \frac{7bB^2}{2249728(bc - ad)^2g(c + dx)} + \frac{7b^2B^2 \log(a + bx)}{2249728(bc - ad)^3g} \\
&= \frac{B^2}{4499456(bc - ad)g(c + dx)^2} + \frac{7bB^2}{2249728(bc - ad)^2g(c + dx)} + \frac{7b^2B^2 \log(a + bx)}{2249728(bc - ad)^3g}
\end{aligned}$$

**Mathematica [A]** time = 1.08428, size = 290, normalized size = 0.77

$$\frac{6b^2(2A^2 - 6AB + 7B^2) \log(a + bx) + \frac{6b(2A^2 - 6AB + 7B^2)(bc - ad)}{c + dx} + \frac{3(2A^2 - 2AB + B^2)(bc - ad)^2}{(c + dx)^2} + \frac{6B(Bd(a + bx)(ad - 4bc - 3bdx) + 2Ab^2(c + dx)^2) \log(a + bx)}{(c + dx)^2}}{12g^3(bc - ad)}$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2/((a\*g + b\*g\*x)\*(c\*i + d\*i\*x)^3), x]

[Out] ((3\*(2\*A^2 - 2\*A\*B + B^2)\*(b\*c - a\*d)^2)/(c + d\*x)^2 + (6\*b\*(2\*A^2 - 6\*A\*B + 7\*B^2)\*(b\*c - a\*d))/(c + d\*x) + 6\*b^2\*(2\*A^2 - 6\*A\*B + 7\*B^2)\*Log[a + b\*x] + (6\*B\*(b\*c - a\*d)\*(B\*(-7\*b\*c + a\*d - 6\*b\*d\*x) + A\*(6\*b\*c - 2\*a\*d + 4\*b\*d\*x))\*Log[(e\*(a + b\*x))/(c + d\*x)]/(c + d\*x)^2 + (6\*B\*(2\*A\*b^2\*(c + d\*x)^2 + B\*d\*(a + b\*x)\*(-4\*b\*c + a\*d - 3\*b\*d\*x))\*Log[(e\*(a + b\*x))/(c + d\*x])^2/(c + d\*x)^2 + 4\*b^2\*B^2\*Log[(e\*(a + b\*x))/(c + d\*x)]^3 - 6\*b^2\*(2\*A^2 - 6\*A\*B + 7\*B^2)\*Log[c + d\*x]/(12\*(b\*c - a\*d)^3\*g\*i^3)

**Maple [B]** time = 0.056, size = 2842, normalized size = 7.6

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)/(d\*i\*x+c\*i)^3,x)

[Out] -2\*d/i^3/(a\*d-b\*c)^4/g\*A^2\*b^2/(d\*x+c)\*a\*c+1/4/i^3/(a\*d-b\*c)^4/g\*B^2/(d\*x+c)^2\*b^3\*c^3-7/2\*d/i^3/(a\*d-b\*c)^4/g\*A\*B\*b^2\*a+3/4\*d^2/i^3/(a\*d-b\*c)^4/g\*B^2/(d\*x+c)^2\*a^2\*b\*c-3/4\*d/i^3/(a\*d-b\*c)^4/g\*B^2/(d\*x+c)^2\*a\*b^2\*c^2+1/i^3/(a\*d-b\*c)^4/g\*A^2\*b^3\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))\*c-1/2\*d^3/i^3/(a\*d-b\*c)^4/g\*A^2/(d\*x+c)^2\*a^3-1/4\*d^3/i^3/(a\*d-b\*c)^4/g\*B^2/(d\*x+c)^2\*a^3+7/2/i^3/(a\*d-b\*c)^4/g\*B^2\*b^3/(d\*x+c)\*c^2+1/i^3/(a\*d-b\*c)^4/g\*A^2\*b^3/(d\*x+c)\*c^2+1/2/i^3/(a\*d-b\*c)^4/g\*A^2/(d\*x+c)^2\*b^3\*c^3+1/3/i^3/(a\*d-b\*c)^4/g\*B^2\*b^3\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))^3\*c-3/2/i^3/(a\*d-b\*c)^4/g\*B^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))^2\*b^3\*c+7/2/i^3/(a\*d-b\*c)^4/g\*B^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))\*b^3\*c-1/3\*d/i^3/(a\*d-b\*c)^4/g\*B^2\*b^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))^3\*a+1/i^3/(a\*d-b\*c)^4/g\*A\*B\*b^3\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))^2\*c+7/2\*d^2/i^3/(a\*d-b\*c)^4/g\*B^2\*b/(d\*x+c)\*a^2+d^2/i^3/(a\*d-b\*c)^4/g\*A^2\*b/(d\*x+c)\*a^2+1/2\*d^3/i^3/(a\*d-b\*c)^4/g\*A\*B/(d\*x+c)^2\*a^3-3/2\*d/i^3/(a\*d-b\*c)^4/g\*A^2/(d\*x+c)^2\*b^2\*c^2\*a+3/2\*d^2/i^3/(a\*d-b\*c)^4/g\*A^2/(d\*x+c)^2\*a^2\*b\*c-3\*d^2

$$\begin{aligned}
& /i^3/(a*d-b*c)^4/g*A*B*b/(d*x+c)*a^2+3*d/i^3/(a*d-b*c)^4/g*A*B*\ln(b*e/d+(a* \\
& d-b*c)*e/d/(d*x+c))*b^2*a-d^3/i^3/(a*d-b*c)^4/g*A*B*\ln(b*e/d+(a*d-b*c)*e/d/ \\
& (d*x+c))/(d*x+c)^2*a^3+2/i^3/(a*d-b*c)^4/g*A*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+ \\
& c))*b^3/(d*x+c)*c^2+1/i^3/(a*d-b*c)^4/g*A*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)) \\
& /(d*x+c)^2*b^3*c^3-3*d^2/i^3/(a*d-b*c)^4/g*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+ \\
& c))*b/(d*x+c)*a^2-d/i^3/(a*d-b*c)^4/g*A*B*b^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c \\
& ))^2*a+d^2/i^3/(a*d-b*c)^4/g*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b/(d*x+c \\
& )*a^2-7*d/i^3/(a*d-b*c)^4/g*B^2*b^2/(d*x+c)*a*c-1/2*d^3/i^3/(a*d-b*c)^4/g*B \\
& ^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)^2*a^3+1/2*d^3/i^3/(a*d-b*c)^4/ \\
& g*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^3-3/i^3/(a*d-b*c)^4/g*A*B \\
& *\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3*c-3/i^3/(a*d-b*c)^4/g*B^2*\ln(b*e/d+(a* \\
& d-b*c)*e/d/(d*x+c))*b^3/(d*x+c)*c^2-1/2/i^3/(a*d-b*c)^4/g*B^2*\ln(b*e/d+(a*d \\
& -b*c)*e/d/(d*x+c))/(d*x+c)^2*b^3*c^3+3/2*d/i^3/(a*d-b*c)^4/g*B^2*\ln(b*e/d+( \\
& a*d-b*c)*e/d/(d*x+c))^2*b^2*a-7/2*d/i^3/(a*d-b*c)^4/g*B^2*\ln(b*e/d+(a*d-b*c \\
& )*e/d/(d*x+c))*b^2*a-d/i^3/(a*d-b*c)^4/g*A^2*b^2*\ln(b*e/d+(a*d-b*c)*e/d/(d* \\
& x+c))*a-3/i^3/(a*d-b*c)^4/g*A*B*b^3/(d*x+c)*c^2-1/2/i^3/(a*d-b*c)^4/g*A*B/( \\
& d*x+c)^2*b^3*c^3+1/i^3/(a*d-b*c)^4/g*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2* \\
& b^3/(d*x+c)*c^2+1/2/i^3/(a*d-b*c)^4/g*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2 \\
& /(d*x+c)^2*b^3*c^3+3/2*d/i^3/(a*d-b*c)^4/g*A^2*b^2*a+15/4*d/i^3/(a*d-b*c)^4 \\
& /g*B^2*b^2*a-15/4/i^3/(a*d-b*c)^4/g*B^2*b^3*c+7/2/i^3/(a*d-b*c)^4/g*A*B*b^3 \\
& *c+3*d^2/i^3/(a*d-b*c)^4/g*A*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^ \\
& 2*b*c-3*d/i^3/(a*d-b*c)^4/g*A*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a \\
& *b^2*c^2-4*d/i^3/(a*d-b*c)^4/g*A*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2/(d*x \\
& +c)*c*a-3/2/i^3/(a*d-b*c)^4/g*A^2*b^3*c-3/2*d/i^3/(a*d-b*c)^4/g*B^2*\ln(b*e/ \\
& d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)^2*b^2*c^2*a-3/2*d^2/i^3/(a*d-b*c)^4/g*A \\
& B/(d*x+c)^2*a^2*b*c+6*d/i^3/(a*d-b*c)^4/g*A*B*b^2/(d*x+c)*a*c+3/2*d/i^3/(a* \\
& d-b*c)^4/g*A*B/(d*x+c)^2*a*b^2*c^2-3/2*d^2/i^3/(a*d-b*c)^4/g*B^2*\ln(b*e/d+( \\
& a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^2*b*c+2*d^2/i^3/(a*d-b*c)^4/g*A*B*\ln(b*e/ \\
& d+(a*d-b*c)*e/d/(d*x+c))*b/(d*x+c)*a^2-2*d/i^3/(a*d-b*c)^4/g*B^2*\ln(b*e/d+( \\
& a*d-b*c)*e/d/(d*x+c))^2*b^2/(d*x+c)*c*a+6*d/i^3/(a*d-b*c)^4/g*B^2*\ln(b*e/d+ \\
& (a*d-b*c)*e/d/(d*x+c))*b^2/(d*x+c)*a*c+3/2*d/i^3/(a*d-b*c)^4/g*B^2*\ln(b*e/d \\
& +(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*b^2*c^2*a+3/2*d^2/i^3/(a*d-b*c)^4/g*B^2*1 \\
& n(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)^2*a^2*b*c
\end{aligned}$$


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**Maxima [B]** time = 2.14816, size = 2857, normalized size = 7.62

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)/(d\*i\*x+c\*i)^3,x, algorith="maxima")

[Out]  $\frac{1}{2}B^2 \left( \frac{(2bx + 3bc - ad)}{(b^2c^2d^2 - 2abc^2d^3 + a^2d^4)} g^3 x^2 + 2 \frac{(b^2c^3d - 2abc^2d^2 + a^2cd^3)}{g^3} x + (b^2c^4 - 2abc^3d + a^2c^2d^2) g^3 \right) + 2b^2 \frac{\log(bx + a)}{((b^3c^3 - 3ab^2c^2d + 3a^2b^2cd^2 - a^3d^3) g^3)} - 2b^2 \frac{\log(dx + c)}{((b^3c^3 - 3ab^2c^2d + 3a^2b^2cd^2 - a^3d^3) g^3)} \log\left(\frac{bex}{dx + c} + \frac{ae}{dx + c}\right)^2 + AB \left( \frac{(2bx + 3bc - ad)}{(b^2c^2d^2 - 2abc^2d^3 + a^2d^4)} g^3 x^2 + 2 \frac{(b^2c^3d - 2abc^2d^2 + a^2cd^3)}{g^3} x + (b^2c^4 - 2abc^3d + a^2c^2d^2) g^3 \right) + 2b^2 \frac{\log(bx + a)}{((b^3c^3 - 3ab^2c^2d + 3a^2b^2cd^2 - a^3d^3) g^3)} - 2b^2 \frac{\log(dx + c)}{((b^3c^3 - 3ab^2c^2d + 3a^2b^2cd^2 - a^3d^3) g^3)} \log\left(\frac{bex}{dx + c} + \frac{ae}{dx + c}\right) - \frac{1}{12}B^2 (6(7b^2c^2 - 8abc^2d + a^2d^2 + 2(b^2d^2x^2 + 2b^2cdx + b^2c^2)) \log(bx + a)^2 + 2(b^2d^2x^2 + 2b^2cdx + b^2c^2) \log(dx + c)^2 + 6(b^2cd - abd^2)x + 6(b^2d^2x^2 + 2b^2cdx + b^2c^2) \log(bx + a) - 2(3b^2d^2x^2 + 6b^2cdx + 3b^2c^2 + 2(b^2d^2x^2 + 2b^2cdx + b^2c^2)) \log(bx + a)) \log(dx + c) \log\left(\frac{bex}{dx + c} + \frac{ae}{dx + c}\right) / (b^3c^5g^3 - 3ab^2c^4d^2g^3 + 3a^2b^2c^3d^2g^3 - a^3c^2d^3g^3 + (b^3c^3d^2g^3 - 3ab^2c^2d^3g^3 + 3a^2b^2cd^4g^3 - a^3d^5g^3)x^2 + 2(b^3c^4d^2g^3 - 3ab^2c^3d^2g^3 + 3a^2b^2cd^3g^3 - a^3cd^4g^3)x) - (45b^2c^2 - 48abc^2d + 3a^2d^2 + 4(b^2d^2x^2 + 2b^2cdx + b^2c^2)) \log(bx + a)^3 - 4(b^2d^2x^2 + 2b^2cdx + b^2c^2) \log(dx + c)^3 + 18(b^2d^2x^2 + 2b^2cdx + b^2c^2) \log(bx + a)^2 + 6(3b^2d^2x^2 + 6b^2cdx + 3b^2c^2 + 2(b^2d^2x^2 + 2b^2cdx + b^2c^2)) \log(bx + a) \log(dx + c)^2 + 42(b^2cd - abd^2)x + 42(b^2d^2x^2 + 2b^2cdx + b^2c^2) \log(bx + a) - 6(7b^2d^2x^2 + 14b^2cdx + 7b^2c^2 + 2(b^2d^2x^2 + 2b^2cdx + b^2c^2)) \log(bx + a)^2 + 6(b^2d^2x^2 + 2b^2cdx + b^2c^2) \log(bx + a) \log(dx + c)) / (b^3c^5g^3 - 3ab^2c^4d^2g^3 + 3a^2b^2c^3d^2g^3 - a^3c^2d^3g^3 + (b^3c^3d^2g^3 - 3ab^2c^2d^3g^3 + 3a^2b^2cd^4g^3 - a^3d^5g^3)x^2 + 2(b^3c^4d^2g^3 - 3ab^2c^3d^2g^3 + 3a^2b^2cd^3g^3 - a^3cd^4g^3)x) + \frac{1}{2}A^2 \left( \frac{(2bx + 3bc - ad)}{(b^2c^2d^2 - 2abc^2d^3 + a^2d^4)} g^3 x^2 + 2 \frac{(b^2c^3d - 2abc^2d^2 + a^2cd^3)}{g^3} x + (b^2c^4 - 2abc^3d + a^2c^2d^2) g^3 \right) + 2b^2 \frac{\log(bx + a)}{((b^3c^3 - 3ab^2c^2d + 3a^2b^2cd^2 - a^3d^3) g^3)} - 2b^2 \frac{\log(dx + c)}{((b^3c^3 - 3ab^2c^2d + 3a^2b^2cd^2 - a^3d^3) g^3)} - \frac{1}{2} (7b^2c^2 - 8abc^2d + a^2d^2 + 2(b^2d^2x^2 + 2b^2cdx + b^2c^2)) \log(bx + a)^2 + 2(b^2d^2x^2 + 2b^2cdx + b^2c^2) \log(dx + c)^2 + 6(b^2cd - abd^2)x + 6(b^2d^2x^2 + 2b^2cdx + b^2c^2) \log(bx + a) - 2(3b^2d^2x^2 + 6b^2cdx + 3b^2c^2 + 2(b^2d^2x^2 + 2b^2cdx + b^2c^2)) \log(bx + a) \log(dx + c) \right) AB / (b^3c^5g^3 - 3ab^2c^4d^2g^3 + 3a^2b^2c^3d^2g^3 - a^3c^2d^3g^3 + (b^3c^3d^2g^3 - 3ab^2c^2d^3g^3 + 3a^2b^2cd^4g^3 - a^3d^5g^3)x^2 + 2(b^3c^4d^2g^3 - 3ab^2c^3d^2g^3 + 3a^2b^2cd^3g^3 - a^3cd^4g^3)x)$

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**Fricas [A]** time = 0.556012, size = 1129, normalized size = 3.01

$$3(6A^2 - 14AB + 15B^2)b^2c^2 - 24(A^2 - 2AB + 2B^2)abcd + 3(2A^2 - 2AB + B^2)a^2d^2 + 4(B^2b^2d^2x^2 + 2B^2b^2cdx + B^2b^2c^2d)$$


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Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)/(d\*i\*x+c\*i)^3,x, algorithm="fricas")

[Out] 1/12\*(3\*(6\*A^2 - 14\*A\*B + 15\*B^2)\*b^2\*c^2 - 24\*(A^2 - 2\*A\*B + 2\*B^2)\*a\*b\*c\*d + 3\*(2\*A^2 - 2\*A\*B + B^2)\*a^2\*d^2 + 4\*(B^2\*b^2\*d^2\*x^2 + 2\*B^2\*b^2\*c\*d\*x + B^2\*b^2\*c^2)\*log((b\*e\*x + a\*e)/(d\*x + c))^3 + 6\*((2\*A\*B - 3\*B^2)\*b^2\*d^2\*x^2 + 2\*A\*B\*b^2\*c^2 - 4\*B^2\*a\*b\*c\*d + B^2\*a^2\*d^2 - 2\*(B^2\*a\*b\*d^2 - 2\*(A\*B - B^2)\*b^2\*c\*d)\*x)\*log((b\*e\*x + a\*e)/(d\*x + c))^2 + 6\*((2\*A^2 - 6\*A\*B + 7\*B^2)\*b^2\*c\*d - (2\*A^2 - 6\*A\*B + 7\*B^2)\*a\*b\*d^2)\*x + 6\*((2\*A^2 - 6\*A\*B + 7\*B^2)\*b^2\*d^2\*x^2 + 2\*A^2\*b^2\*c^2 - 8\*(A\*B - B^2)\*a\*b\*c\*d + (2\*A\*B - B^2)\*a^2\*d^2 + 2\*(2\*(A^2 - 2\*A\*B + 2\*B^2)\*b^2\*c\*d - (2\*A\*B - 3\*B^2)\*a\*b\*d^2)\*x)\*log((b\*e\*x + a\*e)/(d\*x + c)))/((b^3\*c^3\*d^2 - 3\*a\*b^2\*c^2\*d^3 + 3\*a^2\*b\*c^2\*d^4 - a^3\*d^5)\*g\*i^3\*x^2 + 2\*(b^3\*c^4\*d - 3\*a\*b^2\*c^3\*d^2 + 3\*a^2\*b\*c^2\*d^3 - a^3\*c^2\*d^4)\*g\*i^3\*x + (b^3\*c^5 - 3\*a\*b^2\*c^4\*d + 3\*a^2\*b\*c^3\*d^2 - a^3\*c^2\*d^3)\*g\*i^3)

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**Sympy [B]** time = 12.9008, size = 1488, normalized size = 3.97

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*(b\*x+a)/(d\*x+c)))\*\*2/(b\*g\*x+a\*g)/(d\*i\*x+c\*i)\*\*3,x)

[Out] -B\*\*2\*b\*\*2\*log(e\*(a + b\*x)/(c + d\*x))\*\*3/(3\*a\*\*3\*d\*\*3\*g\*i\*\*3 - 9\*a\*\*2\*b\*c\*d\*\*2\*g\*i\*\*3 + 9\*a\*b\*\*2\*c\*\*2\*d\*g\*i\*\*3 - 3\*b\*\*3\*c\*\*3\*g\*i\*\*3) + b\*\*2\*(2\*A\*\*2 - 6\*A\*B + 7\*B\*\*2)\*log(x + (2\*A\*\*2\*a\*b\*\*2\*d + 2\*A\*\*2\*b\*\*3\*c - 6\*A\*B\*a\*b\*\*2\*d - 6\*A\*B\*b\*\*3\*c + 7\*B\*\*2\*a\*b\*\*2\*d + 7\*B\*\*2\*b\*\*3\*c - a\*\*4\*b\*\*2\*d\*\*4\*(2\*A\*\*2 - 6\*A\*B + 7\*B\*\*2))/(a\*d - b\*c))\*\*3 + 4\*a\*\*3\*b\*\*3\*c\*d\*\*3\*(2\*A\*\*2 - 6\*A\*B + 7\*B\*\*2)/(a\*d - b\*c)\*\*3 - 6\*a\*\*2\*b\*\*4\*c\*\*2\*d\*\*2\*(2\*A\*\*2 - 6\*A\*B + 7\*B\*\*2)/(a\*d - b\*c)\*\*3 + 4\*a\*b\*\*5\*c\*\*3\*d\*(2\*A\*\*2 - 6\*A\*B + 7\*B\*\*2)/(a\*d - b\*c)\*\*3 - b\*\*6\*c\*\*4\*(2\*A\*\*2 - 6\*A\*B + 7\*B\*\*2)/(a\*d - b\*c)\*\*3)/(4\*A\*\*2\*b\*\*3\*d - 12\*A\*B\*b\*\*3\*c)

```

d + 14*B**2*b**3*d))/(2*g*i**3*(a*d - b*c)**3) - b**2*(2*A**2 - 6*A*B + 7*B
**2)*log(x + (2*A**2*a*b**2*d + 2*A**2*b**3*c - 6*A*B*a*b**2*d - 6*A*B*b**3
*c + 7*B**2*a*b**2*d + 7*B**2*b**3*c + a**4*b**2*d**4*(2*A**2 - 6*A*B + 7*B
**2)/(a*d - b*c)**3 - 4*a**3*b**3*c*d**3*(2*A**2 - 6*A*B + 7*B**2)/(a*d - b
*c)**3 + 6*a**2*b**4*c**2*d**2*(2*A**2 - 6*A*B + 7*B**2)/(a*d - b*c)**3 - 4
*a*b**5*c**3*d*(2*A**2 - 6*A*B + 7*B**2)/(a*d - b*c)**3 + b**6*c**4*(2*A**2
- 6*A*B + 7*B**2)/(a*d - b*c)**3)/(4*A**2*b**3*d - 12*A*B*b**3*d + 14*B**2
*b**3*d))/(2*g*i**3*(a*d - b*c)**3) + (-2*A*B*a*d + 6*A*B*b*c + 4*A*B*b*d*x
+ B**2*a*d - 7*B**2*b*c - 6*B**2*b*d*x)*log(e*(a + b*x)/(c + d*x))/(2*a**2
*c**2*d**2*g*i**3 + 4*a**2*c*d**3*g*i**3*x + 2*a**2*d**4*g*i**3*x**2 - 4*a*
b*c**3*d*g*i**3 - 8*a*b*c**2*d**2*g*i**3*x - 4*a*b*c*d**3*g*i**3*x**2 + 2*b
**2*c**4*g*i**3 + 4*b**2*c**3*d*g*i**3*x + 2*b**2*c**2*d**2*g*i**3*x**2) +
(-2*A*B*b**2*c**2 - 4*A*B*b**2*c*d*x - 2*A*B*b**2*d**2*x**2 - B**2*a**2*d**
2 + 4*B**2*a*b*c*d + 2*B**2*a*b*d**2*x + 4*B**2*b**2*c*d*x + 3*B**2*b**2*d*
**2*x**2)*log(e*(a + b*x)/(c + d*x))**2/(2*a**3*c**2*d**3*g*i**3 + 4*a**3*c*
d**4*g*i**3*x + 2*a**3*d**5*g*i**3*x**2 - 6*a**2*b*c**3*d**2*g*i**3 - 12*a*
**2*b*c**2*d**3*g*i**3*x - 6*a**2*b*c*d**4*g*i**3*x**2 + 6*a*b**2*c**4*d*g*i
**3 + 12*a*b**2*c**3*d**2*g*i**3*x + 6*a*b**2*c**2*d**3*g*i**3*x**2 - 2*b**
3*c**5*g*i**3 - 4*b**3*c**4*d*g*i**3*x - 2*b**3*c**3*d**2*g*i**3*x**2) + (-
2*A**2*a*d + 6*A**2*b*c + 2*A*B*a*d - 14*A*B*b*c - B**2*a*d + 15*B**2*b*c +
x*(4*A**2*b*d - 12*A*B*b*d + 14*B**2*b*d))/(4*a**2*c**2*d**2*g*i**3 - 8*a*
b*c**3*d*g*i**3 + 4*b**2*c**4*g*i**3 + x**2*(4*a**2*d**4*g*i**3 - 8*a*b*c*d
**3*g*i**3 + 4*b**2*c**2*d**2*g*i**3) + x*(8*a**2*c*d**3*g*i**3 - 16*a*b*c*
**2*d**2*g*i**3 + 8*b**2*c**3*d*g*i**3))

```

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**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B \log\left(\frac{bx+a}{dx+c}\right) + A\right)^2}{(bgx + ag)(dix + ci)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```

[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)/(d*i*x+c*i)^3,x, algo
rithm="giac")

```

```

[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/((b*g*x + a*g)*(d*i*x + c*i)
^3), x)

```



$$3.105 \quad \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^2(ci+dx)^3} dx$$

**Optimal.** Leaf size=525

$$\frac{b^3(c+dx)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)^2}{g^2i^3(a+bx)(bc-ad)^4} - \frac{2b^3B(c+dx)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{g^2i^3(a+bx)(bc-ad)^4} - \frac{b^2d\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)^3}{Bg^2i^3(bc-ad)^4} + \frac{3bd^2(a+bx)\left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{g^2i^3(c+dx)}$$

[Out]  $-(B^2d^3(a+bx)^2)/(4*(b*c-a*d)^4*g^2*i^3*(c+d*x)^2) - (6*A*b*B*d^2*(a+bx))/((b*c-a*d)^4*g^2*i^3*(c+d*x)) + (6*b*B^2*d^2*(a+bx))/((b*c-a*d)^4*g^2*i^3*(c+d*x)) - (2*b^3*B^2*(c+d*x))/((b*c-a*d)^4*g^2*i^3*(a+bx)) - (6*b*B^2*d^2*(a+bx)*\text{Log}[(e*(a+bx))/(c+d*x])/((b*c-a*d)^4*g^2*i^3*(c+d*x)) + (B*d^3*(a+bx)^2*(A+B*\text{Log}[(e*(a+bx))/(c+d*x]]))/(2*(b*c-a*d)^4*g^2*i^3*(c+d*x)^2) - (2*b^3*B*(c+d*x)*(A+B*\text{Log}[(e*(a+bx))/(c+d*x]]))/((b*c-a*d)^4*g^2*i^3*(a+bx)) - (d^3*(a+bx)^2*(A+B*\text{Log}[(e*(a+bx))/(c+d*x]]^2)/(2*(b*c-a*d)^4*g^2*i^3*(c+d*x)^2) + (3*b*d^2*(a+bx)*(A+B*\text{Log}[(e*(a+bx))/(c+d*x]]^2)/((b*c-a*d)^4*g^2*i^3*(c+d*x)) - (b^3*(c+d*x)*(A+B*\text{Log}[(e*(a+bx))/(c+d*x]]^2)/((b*c-a*d)^4*g^2*i^3*(a+bx)) - (b^2*d*(A+B*\text{Log}[(e*(a+bx))/(c+d*x]]^3)/(B*(b*c-a*d)^4*g^2*i^3)$

**Rubi [C]** time = 8.41743, antiderivative size = 2071, normalized size of antiderivative = 3.94, number of steps used = 143, number of rules used = 31, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.738$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

[In]  $\text{Int}[(A + B*\text{Log}[(e*(a+bx))/(c+d*x]])^2/((a*g + b*g*x)^2*(c*i + d*i*x)^3), x]$

[Out]  $(-2*b^2*B^2)/((b*c-a*d)^3*g^2*i^3*(a+bx)) - (B^2*d)/(4*(b*c-a*d)^2*g^2*i^3*(c+d*x)^2) - (11*b*B^2*d)/(2*(b*c-a*d)^3*g^2*i^3*(c+d*x)) - (15*b^2*B^2*d*\text{Log}[a+bx])/((b*c-a*d)^4*g^2*i^3) + (3*A*b^2*B*d*\text{Log}[a+bx]^2)/((b*c-a*d)^4*g^2*i^3) - (3*b^2*B^2*d*\text{Log}[a+bx]^2)/(2*(b*c-a*d)^4*g^2*i^3) - (3*b^2*B^2*d*\text{Log}[a+bx]*\text{Log}[(c+d*x)^{-1}])^2/((b*c-a*d)^4*g^2*i^3) + (3*b^2*B^2*d*\text{Log}[-((d*(a+bx))/(b*c-a*d))]*\text{Log}[(c+d*x)$

$$\begin{aligned}
&)^{-1}]^2)/((b*c - a*d)^4*g^2*i^3) + (3*b^2*B^2*d*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^4*g^2*i^3) + (3*b^2*B^2*d*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^4*g^2*i^3) - \\
&(2*b^2*B*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^3*g^2*i^3*(a + b*x)) + (B*d*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((2*(b*c - a*d)^2*g^2*i^3*(c + d*x)^2) + (5*b*B*d*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^3*g^2*i^3*(c + d*x)) + (3*b^2*B*d*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)^4*g^2*i^3) - (b^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))^2)/((b*c - a*d)^3*g^2*i^3*(a + b*x)) - (d*(A + B*Log[(e*(a + b*x))/(c + d*x)]))^2)/((2*(b*c - a*d)^2*g^2*i^3*(c + d*x)^2) - (2*b*d*(A + B*Log[(e*(a + b*x))/(c + d*x)]))^2)/((b*c - a*d)^3*g^2*i^3*(c + d*x)) - (3*b^2*d*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))^2)/((b*c - a*d)^4*g^2*i^3) + (15*b^2*B^2*d*Log[c + d*x])/((2*(b*c - a*d)^4*g^2*i^3) - (3*b^2*B^2*d*Log[a + b*x]^2*Log[c + d*x])/((b*c - a*d)^4*g^2*i^3) - (6*A*b^2*B*d*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)^4*g^2*i^3) - (6*b^2*B^2*d*Log[a + b*x]*Log[(c + d*x)^{-1}]*Log[c + d*x])/((b*c - a*d)^4*g^2*i^3) + (6*b^2*B^2*d*Log[-((d*(a + b*x))/(b*c - a*d))]*(Log[a + b*x] + Log[(c + d*x)^{-1}] - Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x])/((b*c - a*d)^4*g^2*i^3) - (3*b^2*B*d*(A + B*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x])/((b*c - a*d)^4*g^2*i^3) + (3*b^2*d*(A + B*Log[(e*(a + b*x))/(c + d*x)]))^2*Log[c + d*x])/((b*c - a*d)^4*g^2*i^3) + (3*A*b^2*B*d*Log[c + d*x]^2)/((b*c - a*d)^4*g^2*i^3) - (3*b^2*B^2*d*Log[c + d*x]^2)/((2*(b*c - a*d)^4*g^2*i^3) - (3*b^2*B^2*d*Log[a + b*x]*Log[c + d*x]^2)/((b*c - a*d)^4*g^2*i^3) + (3*b^2*B^2*d*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x]^2)/((b*c - a*d)^4*g^2*i^3) + (b^2*B^2*d*Log[c + d*x]^3)/((b*c - a*d)^4*g^2*i^3) - (6*A*b^2*B*d*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)]))/((b*c - a*d)^4*g^2*i^3) + (3*b^2*B^2*d*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)]))/((b*c - a*d)^4*g^2*i^3) + (3*b^2*B^2*d*Log[a + b*x]^2*Log[(b*(c + d*x))/(b*c - a*d)]))/((b*c - a*d)^4*g^2*i^3) - (6*A*b^2*B*d*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^4*g^2*i^3) + (3*b^2*B^2*d*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^4*g^2*i^3) + (6*b^2*B^2*d*Log[a + b*x]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^4*g^2*i^3) - (6*A*b^2*B*d*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/((b*c - a*d)^4*g^2*i^3) + (3*b^2*B^2*d*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/((b*c - a*d)^4*g^2*i^3) - (6*b^2*B^2*d*Log[(c + d*x)^{-1}]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/((b*c - a*d)^4*g^2*i^3) + (6*b^2*B^2*d*(Log[a + b*x] + Log[(c + d*x)^{-1}] - Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/((b*c - a*d)^4*g^2*i^3) - (6*b^2*B^2*d*Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^4*g^2*i^3) - (6*b^2*B^2*d*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^4*g^2*i^3) - (6*b^2*B^2*d*PolyLog[3, (b*(c + d*x))/(b*c - a*d)]))/((b*c - a*d)^4*g^2*i^3) - (6*b^2*B^2*d*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^4*g^2*i^3)
\end{aligned}$$

Rule 2528

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_.))^(m_.)*((c_.) + (d_.)*(x_.))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_.)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_.))^(n_.)]*(b_.))^(p_.)*(Rfx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, Rfx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
Rfx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_.))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
```

```
)*(x_)^(q_), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_) + Log[(c_)*(x_)^(n_)])*(b_)/(x_), x_Symbol] := Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rule 2394

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_)^(n_))])*(b_)/((f_) + (g_)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

### Rule 2393

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_))])*(b_)/((f_) + (g_)*(x_)), x_Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_)*((d_) + (e_)*(x_)^(n_))]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rule 6688

```
Int[u_, x_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifyIntegrandQ[v, u, x]]
```

### Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]
```

### Rule 2411

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_)^(n_))])*(b_)^(p_)*((f_) + (g_)*(x_)^(q_))*((h_) + (i_)*(x_)^(r_)), x_Symbol] := Dist[1/e, Subst[Int[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
```

\*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2\*r]

#### Rule 2344

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/((x\_)\*((d\_) + (e\_.)\*(x\_))),  
x\_Symbol] := Dist[1/d, Int[(a + b\*Log[c\*x^n])^p/x, x], x] - Dist[e/d, Int[(a + b\*Log[c\*x^n])^p/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

#### Rule 2317

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/((d\_) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^p)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

#### Rule 2507

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.)]^(r\_.)]^(s\_.)\*Log[(i\_.)\*((j\_.)\*((g\_.) + (h\_.)\*(x\_))^(t\_.))^(u\_.)]\*(v\_), x\_Symbol] := With[{k = Simplify[v\*(a + b\*x)\*(c + d\*x)]}, Simp[(k\*Log[i\*(j\*(g + h\*x)^t]^u)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s + 1))/(p\*r\*(s + 1)\*(b\*c - a\*d)), x] - Dist[(k\*h\*t\*u)/(p\*r\*(s + 1)\*(b\*c - a\*d)), Int[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s + 1)/(g + h\*x), x], x] /; FreeQ[k, x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && NeQ[s, -1]

#### Rule 2488

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.)]^(r\_.)]^(s\_.)/((g\_.) + (h\_.)\*(x\_)), x\_Symbol] := -Simp[(Log[-(b\*c - a\*d)/(d\*(a + b\*x))]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/h, x] + Dist[(p\*r\*s\*(b\*c - a\*d))/h, Int[(Log[-(b\*c - a\*d)/(d\*(a + b\*x))]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1))/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && EqQ[b\*g - a\*h, 0] && IGtQ[s, 0]

#### Rule 2506

Int[Log[v\_]\*Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.)]^(r\_.)]^(s\_.)\*(u\_), x\_Symbol] := With[{g = Simplify[((v - 1)\*(c + d\*x))/(a + b\*x)], h = Simplify[u\*(a + b\*x)\*(c + d\*x)]}, -Simp[(h\*PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/(b\*c - a\*d), x] + Dist[h\*p\*r\*s, Int[(PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1))/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f

, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]

### Rule 6610

Int[(u\_)\*PolyLog[n\_, v\_], x\_Symbol] := With[{w = DerivativeDivides[v, u\*v, x]}, Simp[w\*PolyLog[n + 1, v], x] /; !FalseQ[w]] /; FreeQ[n, x]

### Rule 2500

Int[(Log[(e\_)\*((f\_)\*((a\_) + (b\_)\*(x\_))^(p\_))\*((c\_) + (d\_)\*(x\_))^(q\_))^(r\_)]\*((s\_) + Log[(i\_)\*((g\_) + (h\_)\*(x\_))^(n\_)]\*(t\_)))/((j\_) + (k\_)\*(x\_)), x\_Symbol] := Dist[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q)^r] - Log[(a + b\*x)^(p\*r)] - Log[(c + d\*x)^(q\*r)], Int[(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x], x] + (Int[(Log[(a + b\*x)^(p\*r)]\*(s + t\*Log[i\*(g + h\*x)^n])]/(j + k\*x), x] + Int[(Log[(c + d\*x)^(q\*r)]\*(s + t\*Log[i\*(g + h\*x)^n])]/(j + k\*x), x)) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0]

### Rule 2433

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_))^(n\_)]\*(b\_))^(p\_)\*((f\_) + Log[(h\_)\*((i\_) + (j\_)\*(x\_))^(m\_)]\*(g\_))\*((k\_) + (l\_)\*(x\_))^(r\_), x\_Symbol] := Dist[1/e, Subst[Int[(k\*x)/d]^r\*(a + b\*Log[c\*x^n])^p\*(f + g\*Log[h\*(e\*i - d\*j)/e + (j\*x)/e]^m), x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e\*k - d\*1, 0]

### Rule 2375

Int[(Log[(d\_)\*((e\_) + (f\_)\*(x\_))^(m\_))^(r\_)]\*((a\_) + Log[(c\_)\*(x\_))^(n\_)]\*(b\_))^(p\_)/(x\_), x\_Symbol] := Simp[(Log[d\*(e + f\*x^m)^r]\*(a + b\*Log[c\*x^n])^(p + 1))/(b\*n\*(p + 1)), x] - Dist[(f\*m\*r)/(b\*n\*(p + 1)), Int[(x^(m - 1)\*(a + b\*Log[c\*x^n])^(p + 1))/(e + f\*x^m), x], x] /; FreeQ[{a, b, c, d, e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d\*e, 1]

### Rule 2374

Int[(Log[(d\_)\*((e\_) + (f\_)\*(x\_))^(m\_))]\*((a\_) + Log[(c\_)\*(x\_))^(n\_)]\*(b\_))^(p\_)/(x\_), x\_Symbol] := -Simp[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^p)/m, x] + Dist[(b\*n\*p)/m, Int[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0] && EqQ[d\*e, 1]

### Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_Symbol]
:> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d, e, n, p}, x]
&& EqQ[b*d, a*e]
```

#### Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol]
:> Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n)]*(f +
g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, m, n}, x]
&& IntegerQ[r]
```

#### Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol]
:> Simp[Log[x]*(a + b*Log[c*(d + e*x)^n)]*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Log[x]
*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x]
*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, m, n}, x]
&& EqQ[e*i - d*j, 0]
```

#### Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*(s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/(j_.)
+ (k_.)*(x_)), x_Symbol]
:> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r)/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dist[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x]
&& NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

#### Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.)
*(x_)), x_Symbol]
:> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p}, x]
&& NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

#### Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_))^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol]
:> Dist[1/(b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
```

x]

Rule 30

`Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && NeQ[m, -1]`

Rubi steps



$$\begin{aligned}
\int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(105c + 105dx)^3(ag + bgx)^2} dx &= \int \left( \frac{b^3 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1157625(bc - ad)^3 g^2 (a + bx)^2} - \frac{b^3 d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{385875(bc - ad)^4 g^2 (a + bx)} + \frac{d^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1157625(bc - ad)^3 g^2} \right) dx \\
&= -\frac{(b^3 d) \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx} dx}{385875(bc - ad)^4 g^2} + \frac{(b^2 d^2) \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx} dx}{385875(bc - ad)^4 g^2} + \frac{b^3 \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(a+bx)^2} dx}{1157625(bc - ad)^3 g^2} \\
&= -\frac{b^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1157625(bc - ad)^3 g^2 (a + bx)} - \frac{d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2315250(bc - ad)^2 g^2 (c + dx)^2} - \frac{2bd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1157625(bc - ad)^3 g^2} \\
&= -\frac{b^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1157625(bc - ad)^3 g^2 (a + bx)} - \frac{d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2315250(bc - ad)^2 g^2 (c + dx)^2} - \frac{2bd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1157625(bc - ad)^3 g^2} \\
&= -\frac{b^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1157625(bc - ad)^3 g^2 (a + bx)} - \frac{d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2315250(bc - ad)^2 g^2 (c + dx)^2} - \frac{2bd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1157625(bc - ad)^3 g^2} \\
&= -\frac{2b^2 B \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1157625(bc - ad)^3 g^2 (a + bx)} + \frac{Bd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2315250(bc - ad)^2 g^2 (c + dx)^2} + \frac{bBd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{231525(bc - ad)^3 g^2} \\
&= -\frac{2b^2 B \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1157625(bc - ad)^3 g^2 (a + bx)} + \frac{Bd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2315250(bc - ad)^2 g^2 (c + dx)^2} + \frac{bBd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{231525(bc - ad)^3 g^2} \\
&= \frac{b^2 B^2 d \log(a + bx) \log^2\left(\frac{e(a+bx)}{c+dx}\right)}{385875(bc - ad)^4 g^2} - \frac{2b^2 B \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1157625(bc - ad)^3 g^2 (a + bx)} + \frac{Bd \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2315250(bc - ad)^2 g^2 (c + dx)^2} \\
&= -\frac{2b^2 B^2}{1157625(bc - ad)^3 g^2 (a + bx)} - \frac{B^2 d}{4630500(bc - ad)^2 g^2 (c + dx)^2} - \frac{11bB}{2315250(bc - ad)^3 g^2} \\
&= -\frac{2b^2 B^2}{1157625(bc - ad)^3 g^2 (a + bx)} - \frac{B^2 d}{4630500(bc - ad)^2 g^2 (c + dx)^2} - \frac{11bB}{2315250(bc - ad)^3 g^2} \\
&= -\frac{2b^2 B^2}{1157625(bc - ad)^3 g^2 (a + bx)} - \frac{B^2 d}{4630500(bc - ad)^2 g^2 (c + dx)^2} - \frac{11bB}{2315250(bc - ad)^3 g^2}
\end{aligned}$$

**Mathematica [A]** time = 1.50747, size = 453, normalized size = 0.86

$$2B(-3a^2bBd^2(2c+dx) + a^3Bd^3 + 3ab^2d(2A(c+dx)^2 - Bdx(4c+3dx))) + b^3(6Adx(c+dx)^2 + B(6c^2dx + 2c^3 - 3d^3x^3))$$


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Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2/((a\*g + b\*g\*x)^2\*(c\*i + d\*i\*x)^3), x]

[Out] -((2\*A^2 - 2\*A\*B + B^2)\*d\*(b\*c - a\*d)^2\*(a + b\*x) + 2\*b\*(4\*A^2 - 10\*A\*B + 11\*B^2)\*d\*(b\*c - a\*d)\*(a + b\*x)\*(c + d\*x) + 4\*b^2\*(A^2 + 2\*A\*B + 2\*B^2)\*(b\*c - a\*d)\*(c + d\*x)^2 + 6\*b^2\*(2\*A^2 - 2\*A\*B + 5\*B^2)\*d\*(a + b\*x)\*(c + d\*x)^2 \*Log[a + b\*x] + 2\*B\*(b\*c - a\*d)\*((2\*A - B)\*d\*(b\*c - a\*d)\*(a + b\*x) + 2\*b\*(4\*A - 5\*B)\*d\*(a + b\*x)\*(c + d\*x) + 4\*b^2\*(A + B)\*(c + d\*x)^2)\*Log[(e\*(a + b\*x))/(c + d\*x)] + 2\*B\*(a^3\*B\*d^3 - 3\*a^2\*b\*B\*d^2\*(2\*c + d\*x) + 3\*a\*b^2\*d\*(2\*A\*(c + d\*x)^2 - B\*d\*x\*(4\*c + 3\*d\*x)) + b^3\*(6\*A\*d\*x\*(c + d\*x)^2 + B\*(2\*c^3 + 6\*c^2\*d\*x - 3\*d^3\*x^3)))\*Log[(e\*(a + b\*x))/(c + d\*x)]^2 + 4\*b^2\*B^2\*d\*(a + b\*x)\*(c + d\*x)^2\*Log[(e\*(a + b\*x))/(c + d\*x)]^3 - 6\*b^2\*(2\*A^2 - 2\*A\*B + 5\*B^2)\*d\*(a + b\*x)\*(c + d\*x)^2\*Log[c + d\*x]/(4\*(b\*c - a\*d)^4\*g^2\*i^3\*(a + b\*x)\*(c + d\*x)^2)

---

**Maple [B]** time = 0.06, size = 3802, normalized size = 7.2

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^2/(d\*i\*x+c\*i)^3,x)

[Out] 11/2\*d^3/i^3/(a\*d-b\*c)^5/g^2\*B^2\*b/(d\*x+c)\*a^2-23/4\*d/i^3/(a\*d-b\*c)^5/g^2\*B^2\*b^3\*c-1/2\*d^4/i^3/(a\*d-b\*c)^5/g^2\*A^2/(d\*x+c)^2\*a^3-e\*d/i^3/(a\*d-b\*c)^5/g^2\*A^2\*b^3/(b\*e/d+e/(d\*x+c)\*a-e/d/(d\*x+c)\*b\*c)\*a+2\*d^3/i^3/(a\*d-b\*c)^5/g^2\*B^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))^2\*b/(d\*x+c)\*a^2-11/2\*d^2/i^3/(a\*d-b\*c)^5/g^2\*B^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))\*b^2\*a+2\*e/i^3/(a\*d-b\*c)^5/g^2\*B^2\*b^4/(b\*e/d+e/(d\*x+c)\*a-e/d/(d\*x+c)\*b\*c)\*c+e/i^3/(a\*d-b\*c)^5/g^2\*A^2\*b^4/(b\*e/d+e/(d\*x+c)\*a-e/d/(d\*x+c)\*b\*c)\*c-5/2\*d/i^3/(a\*d-b\*c)^5/g^2\*B^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))^2\*b^3\*c-d^2/i^3/(a\*d-b\*c)^5/g^2\*B^2\*b^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))^3\*a+1/2\*d^4/i^3/(a\*d-b\*c)^5/g^2\*B^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))/(d\*x+c)^2\*a^3-1/2\*d^4/i^3/(a\*d-b\*c)^5/g^2\*B^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))^2/(d\*x+c)^2\*a^3+d/i^3/(a\*d-b\*c)^5/g^2\*B^2\*b^3\*ln(b\*e/d+(a

$$\begin{aligned}
& d-b*c)*e/d/(d*x+c))^3*c+1/4*d/i^3/(a*d-b*c)^5/g^2*B^2/(d*x+c)^2*b^3*c^3+2*d \\
& ^3/i^3/(a*d-b*c)^5/g^2*A^2*b/(d*x+c)*a^2+2*d/i^3/(a*d-b*c)^5/g^2*A^2*b^3/(d \\
& *x+c)*c^2+1/2*d/i^3/(a*d-b*c)^5/g^2*A^2/(d*x+c)^2*b^3*c^3+11/2*d/i^3/(a*d-b \\
& *c)^5/g^2*B^2*b^3/(d*x+c)*c^2+5/2*d^2/i^3/(a*d-b*c)^5/g^2*A^2*b^2*a+5/2*d^2 \\
& /i^3/(a*d-b*c)^5/g^2*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b^2*a+11/2*d/i^3 \\
& /(a*d-b*c)^5/g^2*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3*c-3*d^2/i^3/(a*d-b \\
& *c)^5/g^2*A^2*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+3*d/i^3/(a*d-b*c)^5/g^2 \\
& *A^2*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+1/2*d^4/i^3/(a*d-b*c)^5/g^2*A*B/ \\
& (d*x+c)^2*a^3-5/2*d/i^3/(a*d-b*c)^5/g^2*A^2*b^3*c+23/4*d^2/i^3/(a*d-b*c)^5/ \\
& g^2*B^2*b^2*a-11/2*d^2/i^3/(a*d-b*c)^5/g^2*A*B*b^2*a+11/2*d/i^3/(a*d-b*c)^5 \\
& /g^2*A*B*b^3*c-2*e*d/i^3/(a*d-b*c)^5/g^2*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d* \\
& x+c)*b*c)*a-1/4*d^4/i^3/(a*d-b*c)^5/g^2*B^2/(d*x+c)^2*a^3+3*d^3/i^3/(a*d-b* \\
& c)^5/g^2*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^2*b*c-3*d^2/i^3/(a \\
& *d-b*c)^5/g^2*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a*b^2*c^2-8*d^2 \\
& /i^3/(a*d-b*c)^5/g^2*A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2/(d*x+c)*a*c-2* \\
& e*d/i^3/(a*d-b*c)^5/g^2*A*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/ \\
& d+(a*d-b*c)*e/d/(d*x+c))*a+10*d^2/i^3/(a*d-b*c)^5/g^2*B^2*ln(b*e/d+(a*d-b*c \\
& )*e/d/(d*x+c))*b^2/(d*x+c)*a*c+3/2*d^2/i^3/(a*d-b*c)^5/g^2*B^2*ln(b*e/d+(a* \\
& d-b*c)*e/d/(d*x+c))/(d*x+c)^2*b^2*c^2*a+3/2*d^3/i^3/(a*d-b*c)^5/g^2*B^2*ln( \\
& b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)^2*a^2*b*c+4*d^3/i^3/(a*d-b*c)^5/g^2* \\
& A*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b/(d*x+c)*a^2-2*e*d/i^3/(a*d-b*c)^5/g^2 \\
& *B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c \\
& )*a-e*d/i^3/(a*d-b*c)^5/g^2*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln( \\
& b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+2*d/i^3/(a*d-b*c)^5/g^2*B^2*ln(b*e/d+(a*d- \\
& b*c)*e/d/(d*x+c))^2*b^3/(d*x+c)*c^2-d^4/i^3/(a*d-b*c)^5/g^2*A*B*ln(b*e/d+(a \\
& *d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^3-5*d/i^3/(a*d-b*c)^5/g^2*B^2*ln(b*e/d+(a* \\
& d-b*c)*e/d/(d*x+c))*b^3/(d*x+c)*c^2-1/2*d/i^3/(a*d-b*c)^5/g^2*B^2*ln(b*e/d+ \\
& (a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*b^3*c^3-3/2*d^3/i^3/(a*d-b*c)^5/g^2*A*B/(d \\
& *x+c)^2*a^2*b*c+3/2*d^2/i^3/(a*d-b*c)^5/g^2*A*B/(d*x+c)^2*a*b^2*c^2+10*d^2/ \\
& i^3/(a*d-b*c)^5/g^2*A*B*b^2/(d*x+c)*a*c-2*e*d/i^3/(a*d-b*c)^5/g^2*A*B*b^3/( \\
& b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-3/2*d^3/i^3/(a*d-b*c)^5/g^2*B^2*ln(b*e \\
& /d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^2*b*c+4*d/i^3/(a*d-b*c)^5/g^2*A*B*ln( \\
& b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3/(d*x+c)*c^2+d/i^3/(a*d-b*c)^5/g^2*A*B*ln(b \\
& *e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*b^3*c^3+2*e/i^3/(a*d-b*c)^5/g^2*A*B*b \\
& ^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-4* \\
& d^2/i^3/(a*d-b*c)^5/g^2*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b^2/(d*x+c)*a \\
& *c-3/2*d^2/i^3/(a*d-b*c)^5/g^2*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c \\
& )^2*b^2*c^2*a-3*d^2/i^3/(a*d-b*c)^5/g^2*A*B*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x \\
& +c))^2*a-3/2*d^2/i^3/(a*d-b*c)^5/g^2*A^2/(d*x+c)^2*b^2*c^2*a+3*d/i^3/(a*d-b \\
& *c)^5/g^2*A*B*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c+2*e/i^3/(a*d-b*c)^5/g \\
& ^2*B^2*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+ \\
& c))*c+e/i^3/(a*d-b*c)^5/g^2*B^2*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln( \\
& b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-5*d^3/i^3/(a*d-b*c)^5/g^2*B^2*ln(b*e/d+(a* \\
& d-b*c)*e/d/(d*x+c))*b/(d*x+c)*a^2+1/2*d/i^3/(a*d-b*c)^5/g^2*B^2*ln(b*e/d+(a \\
& *d-b*c)*e/d/(d*x+c))^2/(d*x+c)^2*b^3*c^3+5*d^2/i^3/(a*d-b*c)^5/g^2*A*B*ln(b
\end{aligned}$$

$$\begin{aligned} & *e/d+(a*d-b*c)*e/d/(d*x+c))*b^2*a-5*d/i^3/(a*d-b*c)^5/g^2*A*B*\ln(b*e/d+(a*d \\ & -b*c)*e/d/(d*x+c))*b^3*c-5*d/i^3/(a*d-b*c)^5/g^2*A*B*b^3/(d*x+c)*c^2+2*e/i^ \\ & 3/(a*d-b*c)^5/g^2*A*B*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*c-11*d^2/i^3/ \\ & (a*d-b*c)^5/g^2*B^2*b^2/(d*x+c)*a*c-3/4*d^2/i^3/(a*d-b*c)^5/g^2*B^2/(d*x+c) \\ & ^2*b^2*c^2*a+3/2*d^3/i^3/(a*d-b*c)^5/g^2*A^2/(d*x+c)^2*a^2*b*c+3/4*d^3/i^3/ \\ & (a*d-b*c)^5/g^2*B^2/(d*x+c)^2*a^2*b*c-4*d^2/i^3/(a*d-b*c)^5/g^2*A^2*b^2/(d* \\ & x+c)*a*c-5*d^3/i^3/(a*d-b*c)^5/g^2*A*B*b/(d*x+c)*a^2-1/2*d/i^3/(a*d-b*c)^5/ \\ & g^2*A*B/(d*x+c)^2*b^3*c^3 \end{aligned}$$

**Maxima [B]** time = 3.26861, size = 5654, normalized size = 10.77

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^2/(d\*i\*x+c\*i)^3,x, algorithm="maxima")

[Out] 
$$\begin{aligned} & -1/2*B^2*((6*b^2*d^2*x^2 + 2*b^2*c^2 + 5*a*b*c*d - a^2*d^2 + 3*(3*b^2*c*d + \\ & a*b*d^2)*x)/(b^4*c^3*d^2 - 3*a*b^3*c^2*d^3 + 3*a^2*b^2*c*d^4 - a^3*b*d^5) \\ & *g^2*i^3*x^3 + (2*b^4*c^4*d - 5*a*b^3*c^3*d^2 + 3*a^2*b^2*c^2*d^3 + a^3*b*c \\ & *d^4 - a^4*d^5)*g^2*i^3*x^2 + (b^4*c^5 - a*b^3*c^4*d - 3*a^2*b^2*c^3*d^2 + \\ & 5*a^3*b*c^2*d^3 - 2*a^4*c*d^4)*g^2*i^3*x + (a*b^3*c^5 - 3*a^2*b^2*c^4*d + 3 \\ & *a^3*b*c^3*d^2 - a^4*c^2*d^3)*g^2*i^3) + 6*b^2*d*log(b*x + a)/((b^4*c^4 - 4 \\ & *a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^2*i^3) - 6*b^ \\ & 2*d*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c \\ & *d^3 + a^4*d^4)*g^2*i^3))*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2 - A*B*((6*b \\ & ^2*d^2*x^2 + 2*b^2*c^2 + 5*a*b*c*d - a^2*d^2 + 3*(3*b^2*c*d + a*b*d^2)*x)/( \\ & (b^4*c^3*d^2 - 3*a*b^3*c^2*d^3 + 3*a^2*b^2*c*d^4 - a^3*b*d^5)*g^2*i^3*x^3 + \\ & (2*b^4*c^4*d - 5*a*b^3*c^3*d^2 + 3*a^2*b^2*c^2*d^3 + a^3*b*c*d^4 - a^4*d^5) \\ & )*g^2*i^3*x^2 + (b^4*c^5 - a*b^3*c^4*d - 3*a^2*b^2*c^3*d^2 + 5*a^3*b*c^2*d^ \\ & 3 - 2*a^4*c*d^4)*g^2*i^3*x + (a*b^3*c^5 - 3*a^2*b^2*c^4*d + 3*a^3*b*c^3*d^2 \\ & - a^4*c^2*d^3)*g^2*i^3) + 6*b^2*d*log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + \\ & 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^2*i^3) - 6*b^2*d*log(d*x + \\ & c)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4) \\ & *g^2*i^3))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 1/4*B^2*(2*(4*b^3*c^3 - 1 \\ & 5*a*b^2*c^2*d + 12*a^2*b*c*d^2 - a^3*d^3 - 6*(b^3*c*d^2 - a*b^2*d^3)*x^2 - \\ & 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + \\ & 2*a*b^2*c*d^2)*x)*log(b*x + a)^2 - 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c \\ & *d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*log(d*x + c)^2 - 3*( \\ & b^3*c^2*d + 2*a*b^2*c*d^2 - 3*a^2*b*d^3)*x - 6*(b^3*d^3*x^3 + a*b^2*c^2*d + \\ & (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*log(b*x + a \end{aligned}$$



$$\begin{aligned}
& c^2d + a^2b^2d^3)x^2 + (b^3c^2d + 2ab^2c^2d^2)x \log(dx + c)^2 - 3(b^3c^2d + 2ab^2c^2d^2 - 3a^2b^2d^3)x - 6(b^3d^3x^3 + ab^2c^2d \\
& + (2b^3c^2d + ab^2d^3)x^2 + (b^3c^2d + 2ab^2c^2d^2)x \log(bx + a) + 6(b^3d^3x^3 + ab^2c^2d + (2b^3c^2d + ab^2d^3)x^2 + (b^3c^2d + 2ab^2c^2d^2)x + 2(b^3d^3x^3 + ab^2c^2d + (2b^3c^2d + ab^2d^3)x^2 + (b^3c^2d + 2ab^2c^2d^2)x) \log(bx + a)) \log(dx + c) \cdot A \cdot B \\
& / (a^4b^4c^6g^2i^3 - 4a^2b^3c^5d^4g^2i^3 + 6a^3b^2c^4d^2g^2i^3 - 4a^4b^2c^3d^3g^2i^3 + a^5c^2d^4g^2i^3 + (b^5c^4d^2g^2i^3 - 4ab^4c^3d^3g^2i^3 + 6a^2b^3c^2d^4g^2i^3 - 4a^3b^2c^2d^5g^2i^3 + a^4b^2d^6g^2i^3)x^3 + (2b^5c^5d^4g^2i^3 - 7ab^4c^4d^2g^2i^3 + 8a^2b^3c^3d^3g^2i^3 - 2a^3b^2c^2d^4g^2i^3 - 2a^4b^2c^2d^5g^2i^3 + a^5d^6g^2i^3)x^2 + (b^5c^6g^2i^3 - 2ab^4c^5d^4g^2i^3 - 2a^2b^3c^4d^2g^2i^3 + 8a^3b^2c^3d^3g^2i^3 - 7a^4b^2c^2d^4g^2i^3 + 3 + 2a^5c^2d^5g^2i^3)x)
\end{aligned}$$

**Fricas [A]** time = 0.561856, size = 2061, normalized size = 3.93

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^2/(d\*i\*x+c\*i)^3,x, alg  
 orithm="fricas")

[Out] 
$$\begin{aligned}
& -1/4*(4*(A^2 + 2AB + 2B^2)*b^3c^3 + 3*(2A^2 - 10AB + 5B^2)*ab^2c^2d^2 - 12*(A^2 - 2AB + 2B^2)*a^2b^2c^2d^2 + (2A^2 - 2AB + B^2)*a^3d^3 \\
& + 4*(B^2b^3d^3x^3 + B^2a^2b^2c^2d + (2B^2b^3c^2d + B^2a^2b^2d^3)*x^2 + (B^2b^3c^2d + 2B^2a^2b^2c^2d^2)x) \log((bex + ae)/(dx + c))^3 \\
& + 6*((2A^2 - 2AB + 5B^2)*b^3c^2d^2 - (2A^2 - 2AB + 5B^2)*ab^2d^3)x^2 + 2*(3*(2AB - B^2)*b^3d^3x^3 + 2B^2b^3c^3 + 6ABab^2c^2d - 6B^2a^2b^2c^2d^2 + B^2a^3d^3 + 3*(4ABb^3c^2d^2 + (2AB - 3B^2)*ab^2d^3)x^2 - 3*(B^2a^2b^2d^3 - 2*(AB + B^2)*b^3c^2d - 4*(AB - B^2)*ab^2c^2d^2)x) \log((bex + ae)/(dx + c))^2 + 3*((6A^2 - 2AB + 13B^2)*b^3c^2d - 2*(2A^2 + 2AB + 3B^2)*ab^2c^2d^2 - (2A^2 - 6AB + 7B^2)*a^2b^2d^3)x + 2*(3*(2A^2 - 2AB + 5B^2)*b^3d^3x^3 + 6A^2a^2b^2c^2d + 4*(AB + B^2)*b^3c^3 - 12*(AB - B^2)*a^2b^2c^2d^2 + (2AB - B^2)*a^3d^3 + 3*(4*(A^2 + 2B^2)*b^3c^2d^2 + (2A^2 - 6AB + 7B^2)*ab^2d^3)x^2 + 3*(2*(A^2 + 2AB + 2B^2)*b^3c^2d + 4*(A^2 - 2AB + 2B^2)*ab^2c^2d^2 - (2AB - 3B^2)*a^2b^2d^3)x) \log((bex + ae)/(dx + c)) / ((b^5c^4d^2 - 4ab^4c^3d^3 + 6a^2b^3c^2d^4 - 4a^3b^2c^2d^5 + a^4b^2d^6)*g^2i^3x^3 + (2b^5c^5d - 7ab^4c^4d^2 + 8a^2b^3c^3d^3 - 2a^3b^2c^2d^4 - 2a^4b^2c^2d^5 + a^5d^6)*g^2i^3x^2 + (b^5c^6 - 2ab^4c^5d
\end{aligned}$$

$$- 2*a^2*b^3*c^4*d^2 + 8*a^3*b^2*c^3*d^3 - 7*a^4*b*c^2*d^4 + 2*a^5*c*d^5)*g^2*i^3*x + (a*b^4*c^6 - 4*a^2*b^3*c^5*d + 6*a^3*b^2*c^4*d^2 - 4*a^4*b*c^3*d^3 + a^5*c^2*d^4)*g^2*i^3)$$

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**Sympy [B]** time = 72.3652, size = 2683, normalized size = 5.11

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*(b\*x+a)/(d\*x+c)))\*2/(b\*g\*x+a\*g)\*2/(d\*i\*x+c\*i)\*\*3,x)

[Out] 
$$-B**2*b**2*d*log(e*(a + b*x)/(c + d*x))**3/(a**4*d**4*g**2*i**3 - 4*a**3*b*c*d**3*g**2*i**3 + 6*a**2*b**2*c**2*d**2*g**2*i**3 - 4*a*b**3*c**3*d*g**2*i**3 + b**4*c**4*g**2*i**3) + 3*b**2*d*(2*A**2 - 2*A*B + 5*B**2)*log(x + (6*A**2*a*b**2*d**2 + 6*A**2*b**3*c*d - 6*A*B*a*b**2*d**2 - 6*A*B*b**3*c*d + 15*B**2*a*b**2*d**2 + 15*B**2*b**3*c*d - 3*a**5*b**2*d**6*(2*A**2 - 2*A*B + 5*B**2)/(a*d - b*c)**4 + 15*a**4*b**3*c*d**5*(2*A**2 - 2*A*B + 5*B**2)/(a*d - b*c)**4 - 30*a**3*b**4*c**2*d**4*(2*A**2 - 2*A*B + 5*B**2)/(a*d - b*c)**4 + 30*a**2*b**5*c**3*d**3*(2*A**2 - 2*A*B + 5*B**2)/(a*d - b*c)**4 - 15*a*b**6*c**4*d**2*(2*A**2 - 2*A*B + 5*B**2)/(a*d - b*c)**4 + 3*b**7*c**5*d*(2*A**2 - 2*A*B + 5*B**2)/(a*d - b*c)**4)/(12*A**2*b**3*d**2 - 12*A*B*b**3*d**2 + 30*B**2*b**3*d**2))/(2*g**2*i**3*(a*d - b*c)**4) - 3*b**2*d*(2*A**2 - 2*A*B + 5*B**2)*log(x + (6*A**2*a*b**2*d**2 + 6*A**2*b**3*c*d - 6*A*B*a*b**2*d**2 - 6*A*B*b**3*c*d + 15*B**2*a*b**2*d**2 + 15*B**2*b**3*c*d + 3*a**5*b**2*d**6*(2*A**2 - 2*A*B + 5*B**2)/(a*d - b*c)**4 - 15*a**4*b**3*c*d**5*(2*A**2 - 2*A*B + 5*B**2)/(a*d - b*c)**4 + 30*a**3*b**4*c**2*d**4*(2*A**2 - 2*A*B + 5*B**2)/(a*d - b*c)**4 - 30*a**2*b**5*c**3*d**3*(2*A**2 - 2*A*B + 5*B**2)/(a*d - b*c)**4 + 15*a*b**6*c**4*d**2*(2*A**2 - 2*A*B + 5*B**2)/(a*d - b*c)**4 - 3*b**7*c**5*d*(2*A**2 - 2*A*B + 5*B**2)/(a*d - b*c)**4)/(12*A**2*b**3*d**2 - 12*A*B*b**3*d**2 + 30*B**2*b**3*d**2))/(2*g**2*i**3*(a*d - b*c)**4) + (-2*A*B*a**2*d**2 + 10*A*B*a*b*c*d + 6*A*B*a*b*d**2*x + 4*A*B*b**2*c**2 + 18*A*B*b**2*c*d*x + 12*A*B*b**2*d**2*x**2 + B**2*a**2*d**2 - 11*B**2*a*b*c*d - 9*B**2*a*b*d**2*x + 4*B**2*b**2*c**2 - 3*B**2*b**2*c*d*x - 6*B**2*b**2*d**2*x**2)*log(e*(a + b*x)/(c + d*x))/(2*a**4*c**2*d**3*g**2*i**3 + 4*a**4*c*d**4*g**2*i**3*x + 2*a**4*d**5*g**2*i**3*x**2 - 6*a**3*b*c**3*d**2*g**2*i**3 - 10*a**3*b*c**2*d**3*g**2*i**3*x - 2*a**3*b*c*d**4*g**2*i**3*x**2 + 2*a**3*b*d**5*g**2*i**3*x**3 + 6*a**2*b**2*c**4*d*g**2*i**3 + 6*a**2*b**2*c**3*d**2*g**2*i**3*x - 6*a**2*b**2*c**2*d**3*g**2*i**3*x**2 - 6*a**2*b**2*c*d**4*g**2*i**3*x**3 - 2*a*b**3*c**5*g**2*i**3 + 2*a*b**3*c**4*d*g**2*i**3*x + 10*a*b**3*c**3*d**2*g**2*i**3*x**2 + 6*a*b**3*c**2*d**3*g**2*i**3*x**3 - 2*b**4*c**5*g**2*i**3*x - 4*b**4*c**4*d*g**2*i**3*x**2 - 2*b**4*c**3*d$$

```

**2*g**2*i**3*x**3) + (-6*A*B*a*b**2*c**2*d - 12*A*B*a*b**2*c*d**2*x - 6*A*
B*a*b**2*d**3*x**2 - 6*A*B*b**3*c**2*d*x - 12*A*B*b**3*c*d**2*x**2 - 6*A*B*
b**3*d**3*x**3 - B**2*a**3*d**3 + 6*B**2*a**2*b*c*d**2 + 3*B**2*a**2*b*d**3
*x + 12*B**2*a*b**2*c*d**2*x + 9*B**2*a*b**2*d**3*x**2 - 2*B**2*b**3*c**3 -
6*B**2*b**3*c**2*d*x + 3*B**2*b**3*d**3*x**3)*log(e*(a + b*x)/(c + d*x))**
2/(2*a**5*c**2*d**4*g**2*i**3 + 4*a**5*c*d**5*g**2*i**3*x + 2*a**5*d**6*g**
2*i**3*x**2 - 8*a**4*b*c**3*d**3*g**2*i**3 - 14*a**4*b*c**2*d**4*g**2*i**3*
x - 4*a**4*b*c*d**5*g**2*i**3*x**2 + 2*a**4*b*d**6*g**2*i**3*x**3 + 12*a**3
*b**2*c**4*d**2*g**2*i**3 + 16*a**3*b**2*c**3*d**3*g**2*i**3*x - 4*a**3*b**
2*c**2*d**4*g**2*i**3*x**2 - 8*a**3*b**2*c*d**5*g**2*i**3*x**3 - 8*a**2*b**
3*c**5*d*g**2*i**3 - 4*a**2*b**3*c**4*d**2*g**2*i**3*x + 16*a**2*b**3*c**3*
d**3*g**2*i**3*x**2 + 12*a**2*b**3*c**2*d**4*g**2*i**3*x**3 + 2*a*b**4*c**6
*g**2*i**3 - 4*a*b**4*c**5*d*g**2*i**3*x - 14*a*b**4*c**4*d**2*g**2*i**3*x*
*2 - 8*a*b**4*c**3*d**3*g**2*i**3*x**3 + 2*b**5*c**6*g**2*i**3*x + 4*b**5*c
**5*d*g**2*i**3*x**2 + 2*b**5*c**4*d**2*g**2*i**3*x**3) + (-2*A**2*a**2*d**
2 + 10*A**2*a*b*c*d + 4*A**2*b**2*c**2 + 2*A*B*a**2*d**2 - 22*A*B*a*b*c*d +
8*A*B*b**2*c**2 - B**2*a**2*d**2 + 23*B**2*a*b*c*d + 8*B**2*b**2*c**2 + x*
*2*(12*A**2*b**2*d**2 - 12*A*B*b**2*d**2 + 30*B**2*b**2*d**2) + x*(6*A**2*a
*b*d**2 + 18*A**2*b**2*c*d - 18*A*B*a*b*d**2 - 6*A*B*b**2*c*d + 21*B**2*a*b
*d**2 + 39*B**2*b**2*c*d))/(4*a**4*c**2*d**3*g**2*i**3 - 12*a**3*b*c**3*d**
2*g**2*i**3 + 12*a**2*b**2*c**4*d*g**2*i**3 - 4*a*b**3*c**5*g**2*i**3 + x**
3*(4*a**3*b*d**5*g**2*i**3 - 12*a**2*b**2*c*d**4*g**2*i**3 + 12*a*b**3*c**2
*d**3*g**2*i**3 - 4*b**4*c**3*d**2*g**2*i**3) + x**2*(4*a**4*d**5*g**2*i**3
- 4*a**3*b*c*d**4*g**2*i**3 - 12*a**2*b**2*c**2*d**3*g**2*i**3 + 20*a*b**3
*c**3*d**2*g**2*i**3 - 8*b**4*c**4*d*g**2*i**3) + x*(8*a**4*c*d**4*g**2*i**
3 - 20*a**3*b*c**2*d**3*g**2*i**3 + 12*a**2*b**2*c**3*d**2*g**2*i**3 + 4*a*
b**3*c**4*d*g**2*i**3 - 4*b**4*c**5*g**2*i**3))

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**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B \log\left(\frac{bx+ae}{dx+c}\right) + A\right)^2}{(bgx + ag)^2 (dix + ci)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^2/(d\*i\*x+c\*i)^3,x, algorith="giac")

[Out] integrate((B\*log((b\*x + a)\*e/(d\*x + c)) + A)^2/((b\*g\*x + a\*g)^2\*(d\*i\*x + c\*i)^3), x)



$$3.106 \quad \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^3(ci+dix)^3} dx$$

**Optimal.** Leaf size=685

$$\frac{2b^2d^2 \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)^3}{Bg^3i^3(bc-ad)^5} - \frac{b^4(c+dx)^2 \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)^2}{2g^3i^3(a+bx)^2(bc-ad)^5} - \frac{b^4B(c+dx)^2 \left(B \log\left(\frac{e(a+bx)}{c+dx}\right) + A\right)}{2g^3i^3(a+bx)^2(bc-ad)^5} + \frac{4b^3d(c+dx)}{g^3i^3(a+bx)^2}$$

[Out]  $(B^2d^4(a+bx)^2)/(4(b^2c-ad)^5g^3i^3(c+dx)^2) + (8Ab^2B^2d^3(a+bx))/((b^2c-ad)^5g^3i^3(c+dx)) - (8b^2B^2d^3(a+bx))/((b^2c-ad)^5g^3i^3(c+dx)) + (8b^3B^2d^3(c+dx))/((b^2c-ad)^5g^3i^3(a+bx)) - (b^4B^2(c+dx)^2)/(4(b^2c-ad)^5g^3i^3(a+bx)^2) + (8b^2B^2d^3(a+bx)*\text{Log}[(e(a+bx))/(c+dx)])/((b^2c-ad)^5g^3i^3(c+dx)) - (Bd^4(a+bx)^2*(A+B*\text{Log}[(e(a+bx))/(c+dx)]))/(2(b^2c-ad)^5g^3i^3(c+dx)^2) + (8b^3B^2d^3(c+dx)*(A+B*\text{Log}[(e(a+bx))/(c+dx)]))/((b^2c-ad)^5g^3i^3(a+bx)) - (b^4B^2(c+dx)^2*(A+B*\text{Log}[(e(a+bx))/(c+dx)]))/(2(b^2c-ad)^5g^3i^3(a+bx)^2) + (d^4(a+bx)^2*(A+B*\text{Log}[(e(a+bx))/(c+dx)])^2)/(2(b^2c-ad)^5g^3i^3(c+dx)^2) - (4b^2d^3(a+bx)*(A+B*\text{Log}[(e(a+bx))/(c+dx)]))^2/((b^2c-ad)^5g^3i^3(c+dx)) + (4b^3d^3(c+dx)*(A+B*\text{Log}[(e(a+bx))/(c+dx)]))^2/((b^2c-ad)^5g^3i^3(a+bx)) - (b^4(c+dx)^2*(A+B*\text{Log}[(e(a+bx))/(c+dx)]))^2/(2(b^2c-ad)^5g^3i^3(a+bx)^2) + (2b^2d^2*(A+B*\text{Log}[(e(a+bx))/(c+dx)]))^3/(B(b^2c-ad)^5g^3i^3)$

**Rubi [C]** time = 9.57928, antiderivative size = 1921, normalized size of antiderivative = 2.8, number of steps used = 173, number of rules used = 31, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.738$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x]))^2/((a\*g + b\*g\*x)^3\*(c\*i + d\*i\*x)^3), x]

[Out]  $-(b^2B^2)/(4(b^2c-ad)^3g^3i^3(a+bx)^2) + (15b^2B^2d)/(2(b^2c-ad)^4g^3i^3(a+bx)) + (B^2d^2)/(4(b^2c-ad)^3g^3i^3(c+dx)^2)$

$$\begin{aligned}
& ) + (15*b*B^2*d^2)/(2*(b*c - a*d)^4*g^3*i^3*(c + d*x)) + (15*b^2*B^2*d^2*Log[a + b*x])/((b*c - a*d)^5*g^3*i^3) - (6*A*b^2*B*d^2*Log[a + b*x]^2)/((b*c - a*d)^5*g^3*i^3) + (6*b^2*B^2*d^2*Log[a + b*x]*Log[(c + d*x)^(-1)]^2)/((b*c - a*d)^5*g^3*i^3) - (6*b^2*B^2*d^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^(-1)]^2)/((b*c - a*d)^5*g^3*i^3) - (6*b^2*B^2*d^2*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^5*g^3*i^3) - (6*b^2*B^2*d^2*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^5*g^3*i^3) - (b^2*B*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^3*g^3*i^3*(a + b*x)^2) + (7*b^2*B*d*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b*c - a*d)^4*g^3*i^3*(a + b*x) - (B*d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^3*g^3*i^3*(c + d*x)^2) - (7*b*B*d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b*c - a*d)^4*g^3*i^3*(c + d*x) - (b^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]^2)/(2*(b*c - a*d)^3*g^3*i^3*(a + b*x)^2) + (3*b^2*d*(A + B*Log[(e*(a + b*x))/(c + d*x)]^2)/(b*c - a*d)^4*g^3*i^3*(a + b*x) + (d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]^2)/(2*(b*c - a*d)^3*g^3*i^3*(c + d*x)^2) + (3*b*d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]^2)/(b*c - a*d)^4*g^3*i^3*(c + d*x) + (6*b^2*d^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]^2)/(b*c - a*d)^5*g^3*i^3) - (15*b^2*B^2*d^2*Log[c + d*x])/((b*c - a*d)^5*g^3*i^3) + (6*b^2*B^2*d^2*Log[a + b*x]^2*Log[c + d*x])/((b*c - a*d)^5*g^3*i^3) + (12*A*b^2*B*d^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)^5*g^3*i^3) + (12*b^2*B^2*d^2*Log[a + b*x]*Log[(c + d*x)^(-1)]*Log[c + d*x])/((b*c - a*d)^5*g^3*i^3) - (12*b^2*B^2*d^2*Log[-((d*(a + b*x))/(b*c - a*d))]*(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/((b*c - a*d)^5*g^3*i^3) - (6*b^2*d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]^2*Log[c + d*x])/((b*c - a*d)^5*g^3*i^3) - (6*A*b^2*B*d^2*Log[c + d*x]^2)/(b*c - a*d)^5*g^3*i^3) + (6*b^2*B^2*d^2*Log[a + b*x]*Log[c + d*x]^2)/(b*c - a*d)^5*g^3*i^3) - (6*b^2*B^2*d^2*Log[(e*(a + b*x))/(c + d*x)]*Log[c + d*x]^2)/(b*c - a*d)^5*g^3*i^3) - (2*b^2*B^2*d^2*Log[c + d*x]^3)/(b*c - a*d)^5*g^3*i^3) + (12*A*b^2*B*d^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)]/(b*c - a*d))/((b*c - a*d)^5*g^3*i^3) - (6*b^2*B^2*d^2*Log[a + b*x]^2*Log[(b*(c + d*x))/(b*c - a*d)]/(b*c - a*d))/((b*c - a*d)^5*g^3*i^3) + (12*A*b^2*B*d^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))]/((b*c - a*d)^5*g^3*i^3) - (12*b^2*B^2*d^2*Log[a + b*x]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))]/((b*c - a*d)^5*g^3*i^3) + (12*A*b^2*B*d^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]/(b*c - a*d))/((b*c - a*d)^5*g^3*i^3) + (12*b^2*B^2*d^2*Log[(c + d*x)^(-1)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]/(b*c - a*d))/((b*c - a*d)^5*g^3*i^3) - (12*b^2*B^2*d^2*(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]/(b*c - a*d))/((b*c - a*d)^5*g^3*i^3) + (12*b^2*B^2*d^2*Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))]/((b*c - a*d)^5*g^3*i^3) + (12*b^2*B^2*d^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))]/((b*c - a*d)^5*g^3*i^3) + (12*b^2*B^2*d^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)]/(b*c - a*d))/((b*c - a*d)^5*g^3*i^3) + (12*b^2*B^2*d^2*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))]/((b*c - a*d)^5*g^3*i^3)
\end{aligned}$$

Rule 2528

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(Rfx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, Rfx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
Rfx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
```

```
)*(x_)^(q_), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_) + Log[(c_)*(x_)^(n_)])*(b_)/(x_), x_Symbol] := Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rule 2394

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_)^(n_))])*(b_)/((f_) + (g_)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

### Rule 2393

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_))])*(b_)/((f_) + (g_)*(x_)), x_Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_)*((d_) + (e_)*(x_)^(n_))]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rule 6688

```
Int[u_, x_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifyIntegrandQ[v, u, x]]
```

### Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]
```

### Rule 2411

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_)^(n_))])*(b_)^(p_)*((f_) + (g_)*(x_))^(q_)*((h_) + (i_)*(x_))^(r_), x_Symbol] := Dist[1/e, Subst[Int[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
```

\*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2\*r]

#### Rule 2344

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/((x\_)\*((d\_) + (e\_.)\*(x\_))), x\_Symbol] := Dist[1/d, Int[(a + b\*Log[c\*x^n])^p/x, x], x] - Dist[e/d, Int[(a + b\*Log[c\*x^n])^p/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

#### Rule 2317

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/((d\_) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^p)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

#### Rule 2507

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.)]^(r\_.)]^(s\_.)\*Log[(i\_.)\*((j\_.)\*((g\_.) + (h\_.)\*(x\_))^(t\_.))^(u\_.)]\*(v\_), x\_Symbol] := With[{k = Simplify[v\*(a + b\*x)\*(c + d\*x)]}, Simp[(k\*Log[i\*(j\*(g + h\*x)^t]^u)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s + 1))/(p\*r\*(s + 1)\*(b\*c - a\*d)), x] - Dist[(k\*h\*t\*u)/(p\*r\*(s + 1)\*(b\*c - a\*d)), Int[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s + 1)/(g + h\*x), x], x] /; FreeQ[k, x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && NeQ[s, -1]

#### Rule 2488

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.)]^(r\_.)]^(s\_.)/((g\_.) + (h\_.)\*(x\_)), x\_Symbol] := -Simp[(Log[-(b\*c - a\*d)/(d\*(a + b\*x))]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/h, x] + Dist[(p\*r\*s\*(b\*c - a\*d))/h, Int[(Log[-(b\*c - a\*d)/(d\*(a + b\*x))]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1))/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && EqQ[b\*g - a\*h, 0] && IGtQ[s, 0]

#### Rule 2506

Int[Log[v\_]\*Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.)]^(r\_.)]^(s\_.)\*(u\_), x\_Symbol] := With[{g = Simplify[((v - 1)\*(c + d\*x))/(a + b\*x)], h = Simplify[u\*(a + b\*x)\*(c + d\*x)]}, -Simp[(h\*PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/(b\*c - a\*d), x] + Dist[h\*p\*r\*s, Int[(PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1))/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f

, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]

### Rule 6610

Int[(u\_)\*PolyLog[n\_, v\_], x\_Symbol] := With[{w = DerivativeDivides[v, u\*v, x]}, Simp[w\*PolyLog[n + 1, v], x] /; !FalseQ[w]] /; FreeQ[n, x]

### Rule 2500

Int[(Log[(e\_)\*((f\_)\*((a\_) + (b\_)\*(x\_))^(p\_))\*((c\_) + (d\_)\*(x\_))^(q\_))^(r\_)]\*((s\_) + Log[(i\_)\*((g\_) + (h\_)\*(x\_))^(n\_)]\*(t\_)))/((j\_) + (k\_)\*(x\_)), x\_Symbol] := Dist[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q)^r] - Log[(a + b\*x)^(p\*r)] - Log[(c + d\*x)^(q\*r)], Int[(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x], x] + (Int[(Log[(a + b\*x)^(p\*r)]\*(s + t\*Log[i\*(g + h\*x)^n])]/(j + k\*x), x] + Int[(Log[(c + d\*x)^(q\*r)]\*(s + t\*Log[i\*(g + h\*x)^n])]/(j + k\*x), x)) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0]

### Rule 2433

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_))^(n\_)]\*(b\_))^(p\_)\*((f\_) + Log[(h\_)\*((i\_) + (j\_)\*(x\_))^(m\_)]\*(g\_))\*((k\_) + (l\_)\*(x\_))^(r\_), x\_Symbol] := Dist[1/e, Subst[Int[(k\*x)/d]^r\*(a + b\*Log[c\*x^n])^p\*(f + g\*Log[h\*(e\*i - d\*j)/e + (j\*x)/e]^m), x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e\*k - d\*l, 0]

### Rule 2375

Int[(Log[(d\_)\*((e\_) + (f\_)\*(x\_))^(m\_))^(r\_)]\*((a\_) + Log[(c\_)\*(x\_))^(n\_))\*((b\_))^(p\_))/(x\_), x\_Symbol] := Simp[(Log[d\*(e + f\*x^m)^r]\*(a + b\*Log[c\*x^n])^(p + 1))/(b\*n\*(p + 1)), x] - Dist[(f\*m\*r)/(b\*n\*(p + 1)), Int[(x^(m - 1)\*(a + b\*Log[c\*x^n])^(p + 1))/(e + f\*x^m), x], x] /; FreeQ[{a, b, c, d, e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d\*e, 1]

### Rule 2374

Int[(Log[(d\_)\*((e\_) + (f\_)\*(x\_))^(m\_))]\*((a\_) + Log[(c\_)\*(x\_))^(n\_))\*((b\_))^(p\_))/(x\_), x\_Symbol] := -Simp[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^p)/m, x] + Dist[(b\*n\*p)/m, Int[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0] && EqQ[d\*e, 1]

### Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_Symbol]
:> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d, e, n, p}, x]
&& EqQ[b*d, a*e]
```

### Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol]
:> Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n)]*(f +
g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, m, n}, x]
&& IntegerQ[r]
```

### Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol]
:> Simp[Log[x]*(a + b*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Log[x]
*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x]
*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, m, n}, x]
&& EqQ[e*i - d*j, 0]
```

### Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.)
]^(r_.))*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/(j_.)
+ (k_.)*(x_)), x_Symbol]
:> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r)/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dist[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x]
&& NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

### Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.)
*(x_)), x_Symbol]
:> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p}, x]
&& NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

### Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_))^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol]
:> Dist[1/(b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
```

x]

Rule 30

`Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && NeQ[m, -1]`

Rubi steps



$$\begin{aligned}
\int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(106c + 106dx)^3(ag + bgx)^3} dx &= \int \left( \frac{b^3 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1191016(bc - ad)^3 g^3 (a + bx)^3} - \frac{3b^3 d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1191016(bc - ad)^4 g^3 (a + bx)^2} + \frac{3b^3 d^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{595508(bc - ad)^5 g^3 (a + bx)} \right) dx \\
&= \frac{(3b^3 d^2) \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx} dx}{595508(bc - ad)^5 g^3} - \frac{(3b^2 d^3) \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{c+dx} dx}{595508(bc - ad)^5 g^3} - \frac{(3b^3 d) \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{a+bx} dx}{1191016(bc - ad)^4 g^3} \\
&= -\frac{b^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2382032(bc - ad)^3 g^3 (a + bx)^2} + \frac{3b^2 d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1191016(bc - ad)^4 g^3 (a + bx)} + \frac{d^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2382032(bc - ad)^5 g^3} \\
&= -\frac{b^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2382032(bc - ad)^3 g^3 (a + bx)^2} + \frac{3b^2 d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1191016(bc - ad)^4 g^3 (a + bx)} + \frac{d^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2382032(bc - ad)^5 g^3} \\
&= -\frac{b^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2382032(bc - ad)^3 g^3 (a + bx)^2} + \frac{3b^2 d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1191016(bc - ad)^4 g^3 (a + bx)} + \frac{d^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2382032(bc - ad)^5 g^3} \\
&= -\frac{b^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2382032(bc - ad)^3 g^3 (a + bx)^2} + \frac{3b^2 d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{1191016(bc - ad)^4 g^3 (a + bx)} + \frac{d^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2382032(bc - ad)^5 g^3} \\
&= -\frac{b^2 B \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2382032(bc - ad)^3 g^3 (a + bx)^2} + \frac{7b^2 B d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1191016(bc - ad)^4 g^3 (a + bx)} - \frac{B d^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2382032(bc - ad)^5 g^3} \\
&= -\frac{b^2 B \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2382032(bc - ad)^3 g^3 (a + bx)^2} + \frac{7b^2 B d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1191016(bc - ad)^4 g^3 (a + bx)} - \frac{B d^2 \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2382032(bc - ad)^5 g^3} \\
&= -\frac{3b^2 B^2 d^2 \log(a + bx) \log^2\left(\frac{e(a+bx)}{c+dx}\right)}{595508(bc - ad)^5 g^3} - \frac{b^2 B \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2382032(bc - ad)^3 g^3 (a + bx)^2} + \frac{7b^2 B d \left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{1191016(bc - ad)^4 g^3 (a + bx)} \\
&= -\frac{b^2 B^2}{4764064(bc - ad)^3 g^3 (a + bx)^2} + \frac{15b^2 B^2 d}{2382032(bc - ad)^4 g^3 (a + bx)} + \frac{B^2}{4764064(bc - ad)^5 g^3} \\
&= -\frac{b^2 B^2}{4764064(bc - ad)^3 g^3 (a + bx)^2} + \frac{15b^2 B^2 d}{2382032(bc - ad)^4 g^3 (a + bx)} + \frac{B^2}{4764064(bc - ad)^5 g^3} \\
&= -\frac{b^2 B^2}{4764064(bc - ad)^3 g^3 (a + bx)^2} + \frac{15b^2 B^2 d}{2382032(bc - ad)^4 g^3 (a + bx)} + \frac{B^2}{4764064(bc - ad)^5 g^3}
\end{aligned}$$

**Mathematica [A]** time = 1.96067, size = 611, normalized size = 0.89

$$-2B \left( -6a^2b^2d^2 \left( 2A(c+dx)^2 - Bdx(4c+3dx) \right) + 4a^3bBd^3(2c+dx) - a^4Bd^4 - 4ab^3d \left( 6Adx(c+dx)^2 + B(6c^2dx+2c^3 - \dots \right) \right)$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[(e\*(a + b\*x))/(c + d\*x)])^2/((a\*g + b\*g\*x)^3\*(c\*i + d\*i\*x)^3), x]

[Out] ((2\*A^2 - 2\*A\*B + B^2)\*d^2\*(b\*c - a\*d)^2\*(a + b\*x)^2 + 2\*b\*(6\*A^2 - 14\*A\*B + 15\*B^2)\*d^2\*(b\*c - a\*d)\*(a + b\*x)^2\*(c + d\*x) - b^2\*(2\*A^2 + 2\*A\*B + B^2)\*(b\*c - a\*d)^2\*(c + d\*x)^2 + 2\*b^2\*(6\*A^2 + 14\*A\*B + 15\*B^2)\*d\*(b\*c - a\*d)\*(a + b\*x)\*(c + d\*x)^2 + 12\*b^2\*(2\*A^2 + 5\*B^2)\*d^2\*(a + b\*x)^2\*(c + d\*x)^2\*Log[a + b\*x] + 2\*B\*(b\*c - a\*d)\*((2\*A - B)\*d^2\*(b\*c - a\*d)\*(a + b\*x)^2 + 2\*b\*(6\*A - 7\*B)\*d^2\*(a + b\*x)^2\*(c + d\*x) - b^2\*(2\*A + B)\*(b\*c - a\*d)\*(c + d\*x)^2 + 2\*b^2\*(6\*A + 7\*B)\*d\*(a + b\*x)\*(c + d\*x)^2)\*Log[(e\*(a + b\*x))/(c + d\*x)] - 2\*B\*(-(a^4\*B\*d^4) + 4\*a^3\*b\*B\*d^3\*(2\*c + d\*x) - 6\*a^2\*b^2\*d^2\*(2\*A\*(c + d\*x)^2 - B\*d\*x\*(4\*c + 3\*d\*x)) + b^4\*(-12\*A\*d^2\*x^2\*(c + d\*x)^2 + B\*c\*(c^3 - 4\*c^2\*d\*x - 18\*c\*d^2\*x^2 - 12\*d^3\*x^3)) - 4\*a\*b^3\*d\*(6\*A\*d\*x\*(c + d\*x)^2 + B\*(2\*c^3 + 6\*c^2\*d\*x - 3\*d^3\*x^3))\*Log[(e\*(a + b\*x))/(c + d\*x)]^2 + 8\*b^2\*B^2\*d^2\*(a + b\*x)^2\*(c + d\*x)^2\*Log[(e\*(a + b\*x))/(c + d\*x)]^3 - 12\*b^2\*(2\*A^2 + 5\*B^2)\*d^2\*(a + b\*x)^2\*(c + d\*x)^2\*Log[c + d\*x]/(4\*(b\*c - a\*d)^5\*g^3\*i^3\*(a + b\*x)^2\*(c + d\*x)^2)

**Maple [B]** time = 0.058, size = 4782, normalized size = 7.

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^3/(d\*i\*x+c\*i)^3,x)

[Out] e^2\*d/i^3/(a\*d-b\*c)^6/g^3\*A\*B\*b^4/(b\*e/d+e/(d\*x+c)\*a-e/d/(d\*x+c)\*b\*c)^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))\*a+7/2\*d^3/i^3/(a\*d-b\*c)^6/g^3\*A^2\*b^2\*a+31/4\*d^3/i^3/(a\*d-b\*c)^6/g^3\*B^2\*b^2\*a-31/4\*d^2/i^3/(a\*d-b\*c)^6/g^3\*B^2\*b^3\*c-7/2\*d^2/i^3/(a\*d-b\*c)^6/g^3\*A^2\*b^3\*c+2\*d^2/i^3/(a\*d-b\*c)^6/g^3\*B^2\*b^3\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))^3\*c-15/2\*d^3/i^3/(a\*d-b\*c)^6/g^3\*B^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))\*b^2\*a+15/2\*d^2/i^3/(a\*d-b\*c)^6/g^3\*B^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))\*b^3\*c+1/2\*d^5/i^3/(a\*d-b\*c)^6/g^3\*B^2\*ln(b\*e/d+(a\*d-b\*c)\*e/d/(d\*x+c))/(d\*x+c)^2\*a^3-7/2\*d^2/i^3/(a\*d-b\*c)^6/g^3\*B^2\*ln(b\*e/d+(a\*d-b\*c)

$$\begin{aligned}
& *e/d/(d*x+c))^2*b^3*c-6*d^3/i^3/(a*d-b*c)^6/g^3*A^2*b^2*\ln(b*e/d+(a*d-b*c)* \\
& e/d/(d*x+c))*a+6*d^2/i^3/(a*d-b*c)^6/g^3*A^2*b^3*\ln(b*e/d+(a*d-b*c)*e/d/(d* \\
& x+c))*c+7/2*d^3/i^3/(a*d-b*c)^6/g^3*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b \\
& ^2*a-2*d^3/i^3/(a*d-b*c)^6/g^3*B^2*b^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*a- \\
& 1/2*d^5/i^3/(a*d-b*c)^6/g^3*B^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2/(d*x+c)^2 \\
& *a^3+1/2*d^2/i^3/(a*d-b*c)^6/g^3*A^2/(d*x+c)^2*b^3*c^3+3*d^2/i^3/(a*d-b*c)^ \\
& 6/g^3*A^2*b^3/(d*x+c)*c^2-1/2*e^2/i^3/(a*d-b*c)^6/g^3*A^2*b^5/(b*e/d+e/(d*x \\
& +c))*a-e/d/(d*x+c)*b*c)^2*c+15/2*d^4/i^3/(a*d-b*c)^6/g^3*B^2*b/(d*x+c)*a^2+1 \\
& 5/2*d^2/i^3/(a*d-b*c)^6/g^3*B^2*b^3/(d*x+c)*c^2+1/4*d^2/i^3/(a*d-b*c)^6/g^3 \\
& *B^2/(d*x+c)^2*b^3*c^3+1/2*d^5/i^3/(a*d-b*c)^6/g^3*A*B/(d*x+c)^2*a^3-1/4*e^ \\
& 2/i^3/(a*d-b*c)^6/g^3*B^2*b^5/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^2*c+3*d^4 \\
& /i^3/(a*d-b*c)^6/g^3*A^2*b/(d*x+c)*a^2-1/2*d^5/i^3/(a*d-b*c)^6/g^3*A^2/(d*x \\
& +c)^2*a^3-1/4*d^5/i^3/(a*d-b*c)^6/g^3*B^2/(d*x+c)^2*a^3-4*e*d^2/i^3/(a*d-b* \\
& c)^6/g^3*B^2*b^3/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)*\ln(b*e/d+(a*d-b*c)*e/d \\
& /(d*x+c))^2*a+4*e*d/i^3/(a*d-b*c)^6/g^3*B^2*b^4/(b*e/d+e/(d*x+c))*a-e/d/(d*x \\
& +c)*b*c)*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-8*e*d^2/i^3/(a*d-b*c)^6/g^3*B^ \\
& 2*b^3/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a \\
& +8*e*d/i^3/(a*d-b*c)^6/g^3*B^2*b^4/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)*\ln(b \\
& *e/d+(a*d-b*c)*e/d/(d*x+c))*c-3/2*d^4/i^3/(a*d-b*c)^6/g^3*A*B/(d*x+c)^2*a^2 \\
& *b*c+3/2*d^3/i^3/(a*d-b*c)^6/g^3*A*B/(d*x+c)^2*a*b^2*c^2+14*d^3/i^3/(a*d-b* \\
& c)^6/g^3*A*B*b^2/(d*x+c)*a*c-8*e*d^2/i^3/(a*d-b*c)^6/g^3*A*B*b^3/(b*e/d+e/( \\
& d*x+c))*a-e/d/(d*x+c)*b*c)*a+8*e*d/i^3/(a*d-b*c)^6/g^3*A*B*b^4/(b*e/d+e/(d*x \\
& +c))*a-e/d/(d*x+c)*b*c)*c-e^2/i^3/(a*d-b*c)^6/g^3*A*B*b^5/(b*e/d+e/(d*x+c))*a \\
& -e/d/(d*x+c)*b*c)^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+6*d^2/i^3/(a*d-b*c)^6 \\
& /g^3*A*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3/(d*x+c)*c^2+1/2*e^2*d/i^3/(a*d \\
& -b*c)^6/g^3*B^2*b^4/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^2*\ln(b*e/d+(a*d-b*c \\
& )*e/d/(d*x+c))^2*a+1/2*e^2*d/i^3/(a*d-b*c)^6/g^3*B^2*b^4/(b*e/d+e/(d*x+c))*a \\
& -e/d/(d*x+c)*b*c)^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+d^2/i^3/(a*d-b*c)^6/g \\
& ^3*A*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*b^3*c^3+3*d^4/i^3/(a*d-b*c \\
& )^6/g^3*A*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a^2*b*c-3*d^3/i^3/(a* \\
& d-b*c)^6/g^3*A*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*x+c)^2*a*b^2*c^2-12*d^3 \\
& /i^3/(a*d-b*c)^6/g^3*A*B*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2/(d*x+c)*a*c+8* \\
& e*d/i^3/(a*d-b*c)^6/g^3*A*B*b^4/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)*\ln(b*e/ \\
& d+(a*d-b*c)*e/d/(d*x+c))*c-15/2*d^3/i^3/(a*d-b*c)^6/g^3*A*B*b^2*a+15/2*d^2/ \\
& i^3/(a*d-b*c)^6/g^3*A*B*b^3*c-3/2*d^3/i^3/(a*d-b*c)^6/g^3*A^2/(d*x+c)^2*a*b \\
& ^2*c^2-7*d^4/i^3/(a*d-b*c)^6/g^3*A*B*b/(d*x+c)*a^2-7*d^2/i^3/(a*d-b*c)^6/g^ \\
& 3*A*B*b^3/(d*x+c)*c^2+1/2*d^2/i^3/(a*d-b*c)^6/g^3*B^2*\ln(b*e/d+(a*d-b*c)*e/ \\
& d/(d*x+c))^2/(d*x+c)^2*b^3*c^3+3*d^4/i^3/(a*d-b*c)^6/g^3*B^2*\ln(b*e/d+(a*d- \\
& b*c)*e/d/(d*x+c))^2*b/(d*x+c)*a^2+3*d^2/i^3/(a*d-b*c)^6/g^3*B^2*\ln(b*e/d+(a \\
& *d-b*c)*e/d/(d*x+c))^2*b^3/(d*x+c)*c^2-1/2*e^2/i^3/(a*d-b*c)^6/g^3*B^2*b^5/ \\
& (b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)^2*\ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-8 \\
& *e*d^2/i^3/(a*d-b*c)^6/g^3*A*B*b^3/(b*e/d+e/(d*x+c))*a-e/d/(d*x+c)*b*c)*\ln(b \\
& *e/d+(a*d-b*c)*e/d/(d*x+c))*a-7*d^2/i^3/(a*d-b*c)^6/g^3*A*B*\ln(b*e/d+(a*d-b \\
& *c)*e/d/(d*x+c))*b^3*c-7*d^4/i^3/(a*d-b*c)^6/g^3*B^2*\ln(b*e/d+(a*d-b*c)*e/d \\
& /(d*x+c))*b/(d*x+c)*a^2-7*d^2/i^3/(a*d-b*c)^6/g^3*B^2*\ln(b*e/d+(a*d-b*c)*e/
\end{aligned}$$

$$\frac{d}{(dx+c)} * b^3 / (dx+c) * c^{2-6*d^3/i^3} / (a*d-b*c)^6 / g^3 * A * B * b^2 * \ln(b*e/d+(a*d-b*c)*e/d/(dx+c))^{2*a-1/2*e^2/i^3} / (a*d-b*c)^6 / g^3 * B^2 * b^5 / (b*e/d+e/(dx+c)*a-e/d/(dx+c)*b*c)^{2*\ln(b*e/d+(a*d-b*c)*e/d/(dx+c))*c-1/2*d^2/i^3} / (a*d-b*c)^6 / g^3 * B^2 * \ln(b*e/d+(a*d-b*c)*e/d/(dx+c)) / (dx+c)^{2*b^3*c^3+6*d^2/i^3} / (a*d-b*c)^6 / g^3 * A * B * b^3 * \ln(b*e/d+(a*d-b*c)*e/d/(dx+c))^{2*c-d^5/i^3} / (a*d-b*c)^6 / g^3 * A * B * \ln(b*e/d+(a*d-b*c)*e/d/(dx+c)) / (dx+c)^{2*a^3-4*e*d^2/i^3} / (a*d-b*c)^6 / g^3 * A^2 * b^3 / (b*e/d+e/(dx+c)*a-e/d/(dx+c)*b*c)^{a+4*e*d/i^3} / (a*d-b*c)^6 / g^3 * A^2 * b^4 / (b*e/d+e/(dx+c)*a-e/d/(dx+c)*b*c)^{c-8*e*d^2/i^3} / (a*d-b*c)^6 / g^3 * B^2 * b^3 / (b*e/d+e/(dx+c)*a-e/d/(dx+c)*b*c)^{a+8*e*d/i^3} / (a*d-b*c)^6 / g^3 * B^2 * b^4 / (b*e/d+e/(dx+c)*a-e/d/(dx+c)*b*c)^{c+1/4*e^2*d/i^3} / (a*d-b*c)^6 / g^3 * B^2 * b^4 / (b*e/d+e/(dx+c)*a-e/d/(dx+c)*b*c)^{2*a+3/4*d^4/i^3} / (a*d-b*c)^6 / g^3 * B^2 / (dx+c)^{2*a*b^2*c^2-6*d^3/i^3} / (a*d-b*c)^6 / g^3 * A^2 * b^2 / (dx+c)^{a*c-15*d^3/i^3} / (a*d-b*c)^6 / g^3 * B^2 * b^2 / (dx+c)^{a*c-1/2*d^2/i^3} / (a*d-b*c)^6 / g^3 * A * B / (dx+c)^{2*b^3*c^3+7*d^3/i^3} / (a*d-b*c)^6 / g^3 * A * B * \ln(b*e/d+(a*d-b*c)*e/d/(dx+c)) * b^{2*a-3/2*d^3/i^3} / (a*d-b*c)^6 / g^3 * B^2 * \ln(b*e/d+(a*d-b*c)*e/d/(dx+c))^{2/(dx+c)^{2*b^2*c^2*a+14*d^3/i^3}} / (a*d-b*c)^6 / g^3 * B^2 * \ln(b*e/d+(a*d-b*c)*e/d/(dx+c)) * b^2 / (dx+c)^{a*c+3/2*d^3/i^3} / (a*d-b*c)^6 / g^3 * B^2 * \ln(b*e/d+(a*d-b*c)*e/d/(dx+c)) / (dx+c)^{2*b^2*c^2*a+3/2*d^4/i^3} / (a*d-b*c)^6 / g^3 * B^2 * \ln(b*e/d+(a*d-b*c)*e/d/(dx+c))^{2/(dx+c)^{2*a^2*b*c-3/2*d^4/i^3}} / (a*d-b*c)^6 / g^3 * B^2 * \ln(b*e/d+(a*d-b*c)*e/d/(dx+c)) / (dx+c)^{2*a^2*b*c+6*d^4/i^3} / (a*d-b*c)^6 / g^3 * A * B * \ln(b*e/d+(a*d-b*c)*e/d/(dx+c)) * b / (dx+c)^{a^2-6*d^3/i^3} / (a*d-b*c)^6 / g^3 * B^2 * \ln(b*e/d+(a*d-b*c)*e/d/(dx+c))^{2*b^2/(dx+c)*a*c+1/2*e^2*d/i^3} / (a*d-b*c)^6 / g^3 * A * B * b^4 / (b*e/d+e/(dx+c)*a-e/d/(dx+c)*b*c)^{2*a-1/2*e^2/i^3} / (a*d-b*c)^6 / g^3 * A * B * b^5 / (b*e/d+e/(dx+c)*a-e/d/(dx+c)*b*c)^{2*c+1/2*e^2*d/i^3} / (a*d-b*c)^6 / g^3 * A^2 * b^4 / (b*e/d+e/(dx+c)*a-e/d/(dx+c)*b*c)^{2*a+3/2*d^4/i^3} / (a*d-b*c)^6 / g^3 * A^2 / (dx+c)^{2*a^2*b*c}$$

**Maxima [B]** time = 3.48238, size = 7537, normalized size = 11.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x, algorithm="maxima")
```

```
[Out] 1/2*B^2*((12*b^3*d^3*x^3 - b^3*c^3 + 7*a*b^2*c^2*d + 7*a^2*b*c*d^2 - a^3*d^3 + 18*(b^3*c*d^2 + a*b^2*d^3)*x^2 + 4*(b^3*c^2*d + 7*a*b^2*c*d^2 + a^2*b*d^3)*x)/((b^6*c^4*d^2 - 4*a*b^5*c^3*d^3 + 6*a^2*b^4*c^2*d^4 - 4*a^3*b^3*c*d^5 + a^4*b^2*d^6)*g^3*i^3*x^4 + 2*(b^6*c^5*d - 3*a*b^5*c^4*d^2 + 2*a^2*b^4*c^3*d^3 + 2*a^3*b^3*c^2*d^4 - 3*a^4*b^2*c*d^5 + a^5*b*d^6)*g^3*i^3*x^3 + (b^
```





$$\begin{aligned}
& d^3 + a^2 b^2 d^4) x^2 + 2(a b^3 c^2 d^2 + a^2 b^2 c d^3) x) \log(dx + c)^2 \\
& - 12(b^4 c^3 d - a b^3 c^2 d^2 - a^2 b^2 c d^3 + a^3 b d^4) x) A B / (a^2 b^5 c^7 g^3 i^3 \\
& - 5 a^3 b^4 c^6 d g^3 i^3 + 10 a^4 b^3 c^5 d^2 g^3 i^3 - 10 a^5 b^2 c^4 d^3 g^3 i^3 + 5 a^6 b c^3 d^4 g^3 i^3 \\
& - a^7 c^2 d^5 g^3 i^3 + (b^7 c^5 d^2 g^3 i^3 - 5 a b^6 c^4 d^3 g^3 i^3 + 10 a^2 b^5 c^3 d^4 g^3 i^3 \\
& - 10 a^3 b^4 c^2 d^5 g^3 i^3 + 5 a^4 b^3 c d^6 g^3 i^3 - a^5 b^2 d^7 g^3 i^3) x^4 + 2(b^7 c^6 d g^3 i^3 \\
& - 4 a b^6 c^5 d^2 g^3 i^3 + 5 a^2 b^5 c^4 d^3 g^3 i^3 - 5 a^3 b^4 c^3 d^4 g^3 i^3 + 4 a^4 b^3 c^2 d^5 g^3 i^3 \\
& + 4 a^5 b^2 c d^6 g^3 i^3 - a^6 b d^7 g^3 i^3) x^3 + (b^7 c^7 g^3 i^3 - a b^6 c^6 d g^3 i^3 - 9 a^2 b^5 c^5 d^2 g^3 i^3 \\
& + 25 a^3 b^4 c^4 d^3 g^3 i^3 - 25 a^4 b^3 c^3 d^4 g^3 i^3 + 9 a^5 b^2 c^2 d^5 g^3 i^3 + a^6 b c d^6 g^3 i^3 \\
& - a^7 d^7 g^3 i^3) x^2 + 2(a b^6 c^7 g^3 i^3 - 4 a^2 b^5 c^6 d g^3 i^3 + 5 a^3 b^4 c^5 d^2 g^3 i^3 - 5 a^4 b^3 c^4 d^3 g^3 i^3 \\
& + 4 a^5 b^2 c^3 d^4 g^3 i^3 + 4 a^6 b c^2 d^5 g^3 i^3 - a^7 c d^6 g^3 i^3) x)
\end{aligned}$$

**Fricas [B]** time = 0.698954, size = 3056, normalized size = 4.46

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)/(d\*x+c)))^2/(b\*g\*x+a\*g)^3/(d\*i\*x+c\*i)^3,x, algorithm="fricas")

[Out] 
$$\begin{aligned}
& -1/4(60 A B a^2 b^2 c^2 d^2 + (2 A^2 + 2 A B + B^2) b^4 c^4 - 16(A^2 + 2 A B + 2 B^2) a b^3 c^3 d + 16(A^2 - 2 A B + 2 B^2) a^3 b c d^3 - (2 A^2 - 2 A B + B^2) a^4 d^4 \\
& - 12((2 A^2 + 5 B^2) b^4 c d^3 - (2 A^2 + 5 B^2) a b^3 d^4) x^3 - 8(B^2 b^4 d^4 x^4 + B^2 a^2 b^2 c^2 d^2 + 2(B^2 b^4 c d^3 + B^2 a b^3 d^4) x^3 \\
& + (B^2 b^4 c^2 d^2 + 4 B^2 a b^3 c d^3 + B^2 a^2 b^2 d^4) x^2 + 2(B^2 a b^3 c^2 d^2 + B^2 a^2 b^2 c d^3) x) \log((b e x + a e) / (d x + c))^3 \\
& + 6(8 A B a b^3 c d^3 - (6 A^2 + 4 A B + 15 B^2) b^4 c^2 d^2 + (6 A^2 - 4 A B + 15 B^2) a^2 b^2 d^4) x^2 - 2(12 A B b^4 d^4 x^4 - B^2 b^4 c^4 \\
& + 8 B^2 a b^3 c^3 d + 12 A B a^2 b^2 c^2 d^2 - 8 B^2 a^3 b c d^3 + B^2 a^4 d^4 + 12((2 A B + B^2) b^4 c d^3 + (2 A B - B^2) a b^3 d^4) x^3 \\
& + 6(8 A B a b^3 c d^3 + (2 A B + 3 B^2) b^4 c^2 d^2 + (2 A B - 3 B^2) a^2 b^2 d^4) x^2 + 4(B^2 b^4 c^3 d - B^2 a^3 b d^4 + 6(A B + B^2) a b^3 c^2 d^2 \\
& + 6(A B - B^2) a^2 b^2 c d^3) x) \log((b e x + a e) / (d x + c))^2 - 4((2 A^2 + 6 A B + 7 B^2) b^4 c^3 d + 6(2 A^2 - A B + 4 B^2) a b^3 c^2 d^2 \\
& - 6(2 A^2 + A B + 4 B^2) a^2 b^2 c d^3 - (2 A^2 - 6 A B + 7 B^2) a^3 b d^4) x - 2(6(2 A^2 + 5 B^2) b^4 d^4 x^4 + 12 A^2 a^2 b^2 c^2 d^2 \\
& - (2 A B + B^2) b^4 c^4 + 16(A B + B^2) a b^3 c^3 d - 16(A B - B^2) a^3 b c d^3 + (2 A B - B^2) a^4 d^4 + 12((2 A^2 + 2 A B + 5 B^2) b^4 c d^3 \\
& + (2 A^2 - 2 A B + 5 B^2) a b^3 d^4) x^3 + 6((2 A^2 + 6 A B + 7 B^2) b^4 c^2 d^2 + 8(A^2 + 2 B^2) a^2 b^2 c^2 d^2)
\end{aligned}$$

$$\begin{aligned}
& a^3 b^3 c^3 d^3 + (2A^2 - 6AB + 7B^2) a^2 b^2 d^4 x^2 + 4((2AB + 3B^2) \\
& b^4 c^3 d + 6(A^2 + 2AB + 2B^2) a b^3 c^2 d^2 + 6(A^2 - 2AB + 2B^2) \\
& ) a^2 b^2 c^3 d^3 - (2AB - 3B^2) a^3 b^3 d^4 x) \log((b e^x + a e)/(d x + c)) \\
& ) / ((b^7 c^5 d^2 - 5 a b^6 c^4 d^3 + 10 a^2 b^5 c^3 d^4 - 10 a^3 b^4 c^2 d^5 \\
& + 5 a^4 b^3 c^3 d^6 - a^5 b^2 d^7) g^3 i^3 x^4 + 2(b^7 c^6 d - 4 a b^6 c^5 \\
& d^2 + 5 a^2 b^5 c^4 d^3 - 5 a^4 b^3 c^2 d^5 + 4 a^5 b^2 c^3 d^6 - a^6 b^3 d^7) \\
& ) g^3 i^3 x^3 + (b^7 c^7 - a b^6 c^6 d - 9 a^2 b^5 c^5 d^2 + 25 a^3 b^4 c^4 d^3 \\
& - 25 a^4 b^3 c^3 d^4 + 9 a^5 b^2 c^2 d^5 + a^6 b^3 c^3 d^6 - a^7 d^7) g^3 i^3 \\
& x^2 + 2(a b^6 c^7 - 4 a^2 b^5 c^6 d + 5 a^3 b^4 c^5 d^2 - 5 a^5 b^2 c^3 d^4 \\
& + 4 a^6 b^3 c^2 d^5 - a^7 c^3 d^6) g^3 i^3 x + (a^2 b^5 c^7 - 5 a^3 b^4 c^6 d \\
& + 10 a^4 b^3 c^5 d^2 - 10 a^5 b^2 c^4 d^3 + 5 a^6 b^3 c^3 d^4 - a^7 c^2 d^5) \\
& ) g^3 i^3
\end{aligned}$$

**Sympy [B]** time = 142.653, size = 3720, normalized size = 5.43

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*(b\*x+a)/(d\*x+c)))\*\*2/(b\*g\*x+a\*g)\*\*3/(d\*i\*x+c\*i)\*\*3,x)

[Out] 
$$\begin{aligned}
& -2B^2 b^2 d^2 \log(e(a + bx)/(c + dx))^3 / (a^5 d^5 g^3 i^3 - 5 a^4 b^3 c^3 d^4 g^3 i^3 + 10 a^3 b^2 c^2 d^3 g^3 i^3 - 10 a^2 b^3 c^3 d^2 g^3 i^3 + 5 a b^4 c^4 d g^3 i^3 - b^5 c^5 g^3 i^3) + 3 b^2 d^2 (2A^2 + 5B^2) \log(x + (6A^2 a b^2 d^3 + 6A^2 b^3 c^3 d^2 + 15B^2 a b^2 d^3 + 15B^2 b^3 c^3 d^2 - 3 a^6 b^2 d^8 (2A^2 + 5B^2)) / (a d - b c))^5 + 18 a^5 b^3 c^3 d^7 (2A^2 + 5B^2) / (a d - b c)^5 - 45 a^4 b^4 c^2 d^6 (2A^2 + 5B^2) / (a d - b c)^5 + 60 a^3 b^5 c^3 d^5 (2A^2 + 5B^2) / (a d - b c)^5 - 45 a^2 b^6 c^4 d^4 (2A^2 + 5B^2) / (a d - b c)^5 + 18 a b^7 c^5 d^3 (2A^2 + 5B^2) / (a d - b c)^5 - 3 b^8 c^6 d^2 (2A^2 + 5B^2) / (a d - b c)^5 / (12 A^2 b^3 d^3 + 30 B^2 b^3 d^3) / (g^3 i^3 (a d - b c)^5) - 3 b^2 d^2 (2A^2 + 5B^2) \log(x + (6A^2 a b^2 d^3 + 6A^2 b^3 c^3 d^2 + 15B^2 a b^2 d^3 + 15B^2 b^3 c^3 d^2 + 3 a^6 b^2 d^8 (2A^2 + 5B^2)) / (a d - b c))^5 - 18 a^5 b^3 c^3 d^7 (2A^2 + 5B^2) / (a d - b c)^5 + 45 a^4 b^4 c^2 d^6 (2A^2 + 5B^2) / (a d - b c)^5 - 60 a^3 b^5 c^3 d^5 (2A^2 + 5B^2) / (a d - b c)^5 + 45 a^2 b^6 c^4 d^4 (2A^2 + 5B^2) / (a d - b c)^5 - 18 a b^7 c^5 d^3 (2A^2 + 5B^2) / (a d - b c)^5 + 3 b^8 c^6 d^2 (2A^2 + 5B^2) / (a d - b c)^5 / (12 A^2 b^3 d^3 + 30 B^2 b^3 d^3) / (g^3 i^3 (a d - b c)^5) + (-2 A B a^3 d^3 + 14 A B a^2 b^3 c^3 d^2 + 8 A B a^2 b^3 d^3 x + 14 A B a b^2 c^2 d + 56 A B a b^2 c^3 d^2 x + 36 A B a b^2 d^3 x^2 - 2 A B b^3 c^3 + 8 A B b^3 c^2 d x + 36 A B b^3 c^3)
\end{aligned}$$



$$\begin{aligned}
& c*d**2*x**2 + 24*A*B*b**3*d**3*x**3 + B**2*a**3*d**3 - 15*B**2*a**2*b*c*d** \\
& 2 - 12*B**2*a**2*b*d**3*x + 15*B**2*a*b**2*c**2*d - 12*B**2*a*b**2*d**3*x** \\
& 2 - B**2*b**3*c**3 + 12*B**2*b**3*c**2*d*x + 12*B**2*b**3*c*d**2*x**2)*\log( \\
& e*(a + b*x)/(c + d*x))/(2*a**6*c**2*d**4*g**3*i**3 + 4*a**6*c*d**5*g**3*i** \\
& 3*x + 2*a**6*d**6*g**3*i**3*x**2 - 8*a**5*b*c**3*d**3*g**3*i**3 - 12*a**5*b \\
& *c**2*d**4*g**3*i**3*x + 4*a**5*b*d**6*g**3*i**3*x**3 + 12*a**4*b**2*c**4*d \\
& **2*g**3*i**3 + 8*a**4*b**2*c**3*d**3*g**3*i**3*x - 18*a**4*b**2*c**2*d**4* \\
& g**3*i**3*x**2 - 12*a**4*b**2*c*d**5*g**3*i**3*x**3 + 2*a**4*b**2*d**6*g**3 \\
& *i**3*x**4 - 8*a**3*b**3*c**5*d*g**3*i**3 + 8*a**3*b**3*c**4*d**2*g**3*i**3 \\
& *x + 32*a**3*b**3*c**3*d**3*g**3*i**3*x**2 + 8*a**3*b**3*c**2*d**4*g**3*i** \\
& 3*x**3 - 8*a**3*b**3*c*d**5*g**3*i**3*x**4 + 2*a**2*b**4*c**6*g**3*i**3 - 1 \\
& 2*a**2*b**4*c**5*d*g**3*i**3*x - 18*a**2*b**4*c**4*d**2*g**3*i**3*x**2 + 8* \\
& a**2*b**4*c**3*d**3*g**3*i**3*x**3 + 12*a**2*b**4*c**2*d**4*g**3*i**3*x**4 \\
& + 4*a*b**5*c**6*g**3*i**3*x - 12*a*b**5*c**4*d**2*g**3*i**3*x**3 - 8*a*b**5 \\
& *c**3*d**3*g**3*i**3*x**4 + 2*b**6*c**6*g**3*i**3*x**2 + 4*b**6*c**5*d*g**3 \\
& *i**3*x**3 + 2*b**6*c**4*d**2*g**3*i**3*x**4) + (-12*A*B*a**2*b**2*c**2*d** \\
& 2 - 24*A*B*a**2*b**2*c*d**3*x - 12*A*B*a**2*b**2*d**4*x**2 - 24*A*B*a*b**3* \\
& c**2*d**2*x - 48*A*B*a*b**3*c*d**3*x**2 - 24*A*B*a*b**3*d**4*x**3 - 12*A*B* \\
& b**4*c**2*d**2*x**2 - 24*A*B*b**4*c*d**3*x**3 - 12*A*B*b**4*d**4*x**4 - B** \\
& 2*a**4*d**4 + 8*B**2*a**3*b*c*d**3 + 4*B**2*a**3*b*d**4*x + 24*B**2*a**2*b* \\
& *2*c*d**3*x + 18*B**2*a**2*b**2*d**4*x**2 - 8*B**2*a*b**3*c**3*d - 24*B**2* \\
& a*b**3*c**2*d**2*x + 12*B**2*a*b**3*d**4*x**3 + B**2*b**4*c**4 - 4*B**2*b** \\
& 4*c**3*d*x - 18*B**2*b**4*c**2*d**2*x**2 - 12*B**2*b**4*c*d**3*x**3)*\log(e* \\
& (a + b*x)/(c + d*x))**2/(2*a**7*c**2*d**5*g**3*i**3 + 4*a**7*c*d**6*g**3*i** \\
& *3*x + 2*a**7*d**7*g**3*i**3*x**2 - 10*a**6*b*c**3*d**4*g**3*i**3 - 16*a**6 \\
& *b*c**2*d**5*g**3*i**3*x - 2*a**6*b*c*d**6*g**3*i**3*x**2 + 4*a**6*b*d**7*g \\
& **3*i**3*x**3 + 20*a**5*b**2*c**4*d**3*g**3*i**3 + 20*a**5*b**2*c**3*d**4*g \\
& **3*i**3*x - 18*a**5*b**2*c**2*d**5*g**3*i**3*x**2 - 16*a**5*b**2*c*d**6*g* \\
& *3*i**3*x**3 + 2*a**5*b**2*d**7*g**3*i**3*x**4 - 20*a**4*b**3*c**5*d**2*g** \\
& 3*i**3 + 50*a**4*b**3*c**3*d**4*g**3*i**3*x**2 + 20*a**4*b**3*c**2*d**5*g** \\
& 3*i**3*x**3 - 10*a**4*b**3*c*d**6*g**3*i**3*x**4 + 10*a**3*b**4*c**6*d*g**3 \\
& *i**3 - 20*a**3*b**4*c**5*d**2*g**3*i**3*x - 50*a**3*b**4*c**4*d**3*g**3*i* \\
& *3*x**2 + 20*a**3*b**4*c**2*d**5*g**3*i**3*x**4 - 2*a**2*b**5*c**7*g**3*i** \\
& 3 + 16*a**2*b**5*c**6*d*g**3*i**3*x + 18*a**2*b**5*c**5*d**2*g**3*i**3*x**2 \\
& - 20*a**2*b**5*c**4*d**3*g**3*i**3*x**3 - 20*a**2*b**5*c**3*d**4*g**3*i**3 \\
& *x**4 - 4*a*b**6*c**7*g**3*i**3*x + 2*a*b**6*c**6*d*g**3*i**3*x**2 + 16*a*b \\
& **6*c**5*d**2*g**3*i**3*x**3 + 10*a*b**6*c**4*d**3*g**3*i**3*x**4 - 2*b**7* \\
& c**7*g**3*i**3*x**2 - 4*b**7*c**6*d*g**3*i**3*x**3 - 2*b**7*c**5*d**2*g**3* \\
& i**3*x**4) + (-2*A**2*a**3*d**3 + 14*A**2*a**2*b*c*d**2 + 14*A**2*a*b**2*c* \\
& *2*d - 2*A**2*b**3*c**3 + 2*A*B*a**3*d**3 - 30*A*B*a**2*b*c*d**2 + 30*A*B*a \\
& *b**2*c**2*d - 2*A*B*b**3*c**3 - B**2*a**3*d**3 + 31*B**2*a**2*b*c*d**2 + 3 \\
& 1*B**2*a*b**2*c**2*d - B**2*b**3*c**3 + x**3*(24*A**2*b**3*d**3 + 60*B**2*b \\
& **3*d**3) + x**2*(36*A**2*a*b**2*d**3 + 36*A**2*b**3*c*d**2 - 24*A*B*a*b**2 \\
& *d**3 + 24*A*B*b**3*c*d**2 + 90*B**2*a*b**2*d**3 + 90*B**2*b**3*c*d**2) + x \\
& *(8*A**2*a**2*b*d**3 + 56*A**2*a*b**2*c*d**2 + 8*A**2*b**3*c**2*d - 24*A*B
\end{aligned}$$

```

a**2*b*d**3 + 24*A*B*b**3*c**2*d + 28*B**2*a**2*b*d**3 + 124*B**2*a*b**2*c*
d**2 + 28*B**2*b**3*c**2*d))/(4*a**6*c**2*d**4*g**3*i**3 - 16*a**5*b*c**3*d
**3*g**3*i**3 + 24*a**4*b**2*c**4*d**2*g**3*i**3 - 16*a**3*b**3*c**5*d*g**3
*i**3 + 4*a**2*b**4*c**6*g**3*i**3 + x**4*(4*a**4*b**2*d**6*g**3*i**3 - 16*
a**3*b**3*c*d**5*g**3*i**3 + 24*a**2*b**4*c**2*d**4*g**3*i**3 - 16*a*b**5*c
**3*d**3*g**3*i**3 + 4*b**6*c**4*d**2*g**3*i**3) + x**3*(8*a**5*b*d**6*g**3
*i**3 - 24*a**4*b**2*c*d**5*g**3*i**3 + 16*a**3*b**3*c**2*d**4*g**3*i**3 +
16*a**2*b**4*c**3*d**3*g**3*i**3 - 24*a*b**5*c**4*d**2*g**3*i**3 + 8*b**6*c
**5*d*g**3*i**3) + x**2*(4*a**6*d**6*g**3*i**3 - 36*a**4*b**2*c**2*d**4*g**
3*i**3 + 64*a**3*b**3*c**3*d**3*g**3*i**3 - 36*a**2*b**4*c**4*d**2*g**3*i**
3 + 4*b**6*c**6*g**3*i**3) + x*(8*a**6*c*d**5*g**3*i**3 - 24*a**5*b*c**2*d*
**4*g**3*i**3 + 16*a**4*b**2*c**3*d**3*g**3*i**3 + 16*a**3*b**3*c**4*d**2*g*
**3*i**3 - 24*a**2*b**4*c**5*d*g**3*i**3 + 8*a*b**5*c**6*g**3*i**3))

```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B \log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)^2}{(bgx + ag)^3 (dix + ci)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```

[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x, alg
orithm="giac")

```

```

[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/((b*g*x + a*g)^3*(d*i*x + c*
i)^3), x)

```

$$3.107 \quad \int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^4(ci+dix)^3} dx$$

**Optimal.** Leaf size=851

$$\frac{2B^2(c+dx)^3b^5}{27(bc-ad)^6g^4i^3(a+bx)^3} - \frac{(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2b^5}{3(bc-ad)^6g^4i^3(a+bx)^3} - \frac{2B(c+dx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)b^5}{9(bc-ad)^6g^4i^3(a+bx)^3} + \frac{5B^2d(c+dx)^3}{4(bc-ad)^6g^4i^3(a+bx)^3}$$

```
[Out] -(B^2*d^5*(a + b*x)^2)/(4*(b*c - a*d)^6*g^4*i^3*(c + d*x)^2) - (10*A*b*B*d^4*(a + b*x))/((b*c - a*d)^6*g^4*i^3*(c + d*x)) + (10*b*B^2*d^4*(a + b*x))/((b*c - a*d)^6*g^4*i^3*(c + d*x)) - (20*b^3*B^2*d^2*(c + d*x))/((b*c - a*d)^6*g^4*i^3*(a + b*x)) + (5*b^4*B^2*d*(c + d*x)^2)/(4*(b*c - a*d)^6*g^4*i^3*(a + b*x)^2) - (2*b^5*B^2*(c + d*x)^3)/(27*(b*c - a*d)^6*g^4*i^3*(a + b*x)^3) - (10*b*B^2*d^4*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/((b*c - a*d)^6*g^4*i^3*(c + d*x)) + (B*d^5*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x]]))/((2*(b*c - a*d)^6*g^4*i^3*(c + d*x)^2) - (20*b^3*B*d^2*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x]])))/((b*c - a*d)^6*g^4*i^3*(a + b*x)) + (5*b^4*B*d*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x]]))/((2*(b*c - a*d)^6*g^4*i^3*(a + b*x)^2) - (2*b^5*B*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x]])))/((9*(b*c - a*d)^6*g^4*i^3*(a + b*x)^3) - (d^5*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2)/(2*(b*c - a*d)^6*g^4*i^3*(c + d*x)^2) + (5*b*d^4*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2)/((b*c - a*d)^6*g^4*i^3*(c + d*x)) - (10*b^3*d^2*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2)/((b*c - a*d)^6*g^4*i^3*(a + b*x)) + (5*b^4*d*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2)/(2*(b*c - a*d)^6*g^4*i^3*(a + b*x)^2) - (b^5*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x]])^2)/(3*(b*c - a*d)^6*g^4*i^3*(a + b*x)^3) - (10*b^2*d^3*(A + B*Log[(e*(a + b*x))/(c + d*x]])^3)/(3*B*(b*c - a*d)^6*g^4*i^3)
```

**Rubi [C]** time = 10.9211, antiderivative size = 2454, normalized size of antiderivative = 2.88, number of steps used = 207, number of rules used = 31, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.738$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x]])^2/((a*g + b*g*x)^4*(c*i + d*i*x)^3), x]
```

[Out] 
$$\begin{aligned} & (-2*b^2*B^2)/(27*(b*c - a*d)^3*g^4*i^3*(a + b*x)^3) + (37*b^2*B^2*d)/(36*(b \\ & *c - a*d)^4*g^4*i^3*(a + b*x)^2) - (319*b^2*B^2*d^2)/(18*(b*c - a*d)^5*g^4* \\ & i^3*(a + b*x)) - (B^2*d^3)/(4*(b*c - a*d)^4*g^4*i^3*(c + d*x)^2) - (19*b*B^ \\ & 2*d^3)/(2*(b*c - a*d)^5*g^4*i^3*(c + d*x)) - (245*b^2*B^2*d^3*Log[a + b*x]) \\ & /((9*(b*c - a*d)^6*g^4*i^3) + (10*A*b^2*B*d^3*Log[a + b*x]^2)/((b*c - a*d)^6 \\ & *g^4*i^3) + (10*b^2*B^2*d^3*Log[a + b*x]^2)/(3*(b*c - a*d)^6*g^4*i^3) - (10 \\ & *b^2*B^2*d^3*Log[a + b*x]*Log[(c + d*x)^(-1)]^2)/((b*c - a*d)^6*g^4*i^3) + \\ & (10*b^2*B^2*d^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^(-1)]^2)/(( \\ & b*c - a*d)^6*g^4*i^3) + (10*b^2*B^2*d^3*Log[-((b*c - a*d)/(d*(a + b*x))])*L \\ & og[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^6*g^4*i^3) + (10*b^2*B^2*d^3*Lo \\ & g[a + b*x]*Log[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^6*g^4*i^3) - (2*b^2 \\ & *B*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((9*(b*c - a*d)^3*g^4*i^3*(a + b*x) \\ & ^3) + (11*b^2*B*d*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((6*(b*c - a*d)^4*g^ \\ & 4*i^3*(a + b*x)^2) - (47*b^2*B*d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((3 \\ & *(b*c - a*d)^5*g^4*i^3*(a + b*x)) + (B*d^3*(A + B*Log[(e*(a + b*x))/(c + d \\ & x)]))/((2*(b*c - a*d)^4*g^4*i^3*(c + d*x)^2) + (9*b*B*d^3*(A + B*Log[(e*(a + \\ & b*x))/(c + d*x)]))/((b*c - a*d)^5*g^4*i^3*(c + d*x)) - (20*b^2*B*d^3*Log[a \\ & + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((3*(b*c - a*d)^6*g^4*i^3) - ( \\ & b^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]^2)/((3*(b*c - a*d)^3*g^4*i^3*(a + b \\ & *x)^3) + (3*b^2*d*(A + B*Log[(e*(a + b*x))/(c + d*x)]^2)/((2*(b*c - a*d)^4* \\ & g^4*i^3*(a + b*x)^2) - (6*b^2*d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]^2)/(( \\ & b*c - a*d)^5*g^4*i^3*(a + b*x)) - (d^3*(A + B*Log[(e*(a + b*x))/(c + d*x)] \\ & )^2)/((2*(b*c - a*d)^4*g^4*i^3*(c + d*x)^2) - (4*b*d^3*(A + B*Log[(e*(a + b \\ & x))/(c + d*x)]^2)/((b*c - a*d)^5*g^4*i^3*(c + d*x)) - (10*b^2*d^3*Log[a + \\ & b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]^2)/((b*c - a*d)^6*g^4*i^3) + (245 \\ & *b^2*B^2*d^3*Log[c + d*x])/((9*(b*c - a*d)^6*g^4*i^3) - (10*b^2*B^2*d^3*Log[ \\ & a + b*x]^2*Log[c + d*x])/((b*c - a*d)^6*g^4*i^3) - (20*A*b^2*B*d^3*Log[-((d \\ & *(a + b*x))/(b*c - a*d)])*Log[c + d*x])/((b*c - a*d)^6*g^4*i^3) - (20*b^2*B \\ & ^2*d^3*Log[-((d*(a + b*x))/(b*c - a*d)])*Log[c + d*x])/((3*(b*c - a*d)^6*g^4 \\ & *i^3) - (20*b^2*B^2*d^3*Log[a + b*x]*Log[(c + d*x)^(-1)]*Log[c + d*x])/((b* \\ & c - a*d)^6*g^4*i^3) + (20*b^2*B^2*d^3*Log[-((d*(a + b*x))/(b*c - a*d)])* (Lo \\ & g[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)]*Log[c + d \\ & x])/((b*c - a*d)^6*g^4*i^3) + (20*b^2*B*d^3*(A + B*Log[(e*(a + b*x))/(c + d \\ & *x)]*Log[c + d*x])/((3*(b*c - a*d)^6*g^4*i^3) + (10*b^2*d^3*(A + B*Log[(e( \\ & a + b*x))/(c + d*x)]^2*Log[c + d*x])/((b*c - a*d)^6*g^4*i^3) + (10*A*b^2*B \\ & *d^3*Log[c + d*x]^2)/((b*c - a*d)^6*g^4*i^3) + (10*b^2*B^2*d^3*Log[c + d*x] \\ & ^2)/((3*(b*c - a*d)^6*g^4*i^3) - (10*b^2*B^2*d^3*Log[a + b*x]*Log[c + d*x]^2 \\ & )/((b*c - a*d)^6*g^4*i^3) + (10*b^2*B^2*d^3*Log[(e*(a + b*x))/(c + d*x)]*Lo \\ & g[c + d*x]^2)/((b*c - a*d)^6*g^4*i^3) + (10*b^2*B^2*d^3*Log[c + d*x]^3)/((3* \\ & (b*c - a*d)^6*g^4*i^3) - (20*A*b^2*B*d^3*Log[a + b*x]*Log[(b*(c + d*x))/(b* \\ & c - a*d)]))/((b*c - a*d)^6*g^4*i^3) - (20*b^2*B^2*d^3*Log[a + b*x]*Log[(b*(c \\ & + d*x))/(b*c - a*d)]))/((3*(b*c - a*d)^6*g^4*i^3) + (10*b^2*B^2*d^3*Log[a + \\ & b*x]^2*Log[(b*(c + d*x))/(b*c - a*d)]))/((b*c - a*d)^6*g^4*i^3) - (20*A*b^2* \\ & B*d^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^6*g^4*i^3) - ( \\ & 20*b^2*B^2*d^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((3*(b*c - a*d)^6*g \end{aligned}$$

$$\begin{aligned} &^4i^3) + (20*b^2*B^2*d^3*Log[a + b*x]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))]/((b*c - a*d)^6*g^4*i^3) - (20*A*b^2*B*d^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]/((b*c - a*d)^6*g^4*i^3) - (20*b^2*B^2*d^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]/(3*(b*c - a*d)^6*g^4*i^3) - (20*b^2*B^2*d^3*Log[(c + d*x)^{-1}]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]/((b*c - a*d)^6*g^4*i^3) + (20*b^2*B^2*d^3*(Log[a + b*x] + Log[(c + d*x)^{-1}] - Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]/((b*c - a*d)^6*g^4*i^3) - (20*b^2*B^2*d^3*Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))]/((b*c - a*d)^6*g^4*i^3) - (20*b^2*B^2*d^3*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))]/((b*c - a*d)^6*g^4*i^3) - (20*b^2*B^2*d^3*PolyLog[3, (b*(c + d*x))/(b*c - a*d)]/((b*c - a*d)^6*g^4*i^3) - (20*b^2*B^2*d^3*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))]/((b*c - a*d)^6*g^4*i^3) \end{aligned}$$
Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[(((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[(((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
```

```
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :=> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :=> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :=> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :=> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e^n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x
), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :=> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]/(x_), x_Symbol] :=> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rule 6688

```
Int[u_, x_Symbol] :=> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_.)
*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] := Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
x_Symbol] := Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] := Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] := With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
h*x)^t]^u)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s + 1))/(p*r*(s + 1)*(b*c
- a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q]^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] := -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
```

$(c + dx)^q r^{s-1} / ((a + bx)(c + dx)), x, x$  /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && EqQ[b\*g - a\*h, 0] && IGtQ[s, 0]

### Rule 2506

Int[Log[v\_]\*Log[(e\_.)\*((f\_.)\*(a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.)]^(r\_.)]^(s\_.)\*(u\_), x\_Symbol] := With[{g = Simplify[((v - 1)\*(c + dx))/(a + bx)], h = Simplify[u\*(a + bx)\*(c + dx)]}, -Simp[(h\*PolyLog[2, 1 - v]\*Log[e\*(f\*(a + bx)^p\*(c + dx)^q]^r]^s)/(b\*c - a\*d), x] + Dist[h\*p\*r\*s, Int[(PolyLog[2, 1 - v]\*Log[e\*(f\*(a + bx)^p\*(c + dx)^q]^r]^s - 1)/((a + bx)\*(c + dx)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]

### Rule 6610

Int[(u\_)\*PolyLog[n\_, v\_], x\_Symbol] := With[{w = DerivativeDivides[v, u\*v, x]}, Simp[w\*PolyLog[n + 1, v], x] /; !FalseQ[w]] /; FreeQ[n, x]

### Rule 2500

Int[(Log[(e\_.)\*((f\_.)\*(a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.)]^(r\_.)]\*((s\_.) + Log[(i\_.)\*((g\_.) + (h\_.)\*(x\_))^(n\_.)]\*(t\_.)))/((j\_.) + (k\_.)\*(x\_)), x\_Symbol] := Dist[Log[e\*(f\*(a + bx)^p\*(c + dx)^q]^r] - Log[(a + bx)^(p\*r)] - Log[(c + dx)^(q\*r)], Int[(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x], x] + (Int[(Log[(a + bx)^(p\*r)]\*(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x] + Int[(Log[(c + dx)^(q\*r)]\*(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0]

### Rule 2433

Int[((a\_.) + Log[(c\_.)\*((d\_.) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_.) + Log[(h\_.)\*((i\_.) + (j\_.)\*(x\_))^(m\_.)]\*(g\_.))\*((k\_.) + (l\_.)\*(x\_))^(r\_.), x\_Symbol] := Dist[1/e, Subst[Int[(k\*x)/d]^r\*(a + b\*Log[c\*x^n])^p\*(f + g\*Log[h\*(e\*i - d\*j)/e + (j\*x)/e]^m), x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e\*k - d\*l, 0]

### Rule 2375

Int[(Log[(d\_.)\*((e\_.) + (f\_.)\*(x\_))^(m\_.)]^(r\_.))\*((a\_.) + Log[(c\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)/(x\_), x\_Symbol] := Simp[(Log[d\*(e + f\*x^m)^r]\*(a + b\*Log[c\*x^n])^(p + 1))/(b\*n\*(p + 1)), x] - Dist[(f\*m\*r)/(b\*n\*(p + 1)), Int[(x^(m - 1)\*(a + b\*Log[c\*x^n])^(p + 1))/(e + f\*x^m), x], x] /; FreeQ[{a, b, c, d,



$e, f, r, m, n, x$  && IGtQ[p, 0] && NeQ[d\*e, 1]

### Rule 2374

Int[(Log[(d\_.)\*((e\_.) + (f\_.)\*(x\_)^(m\_.))]\*((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.))/(x\_), x\_Symbol] := -Simp[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^p)/m, x] + Dist[(b\*n\*p)/m, Int[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0] && EqQ[d\*e, 1]

### Rule 6589

Int[PolyLog[n\_, (c\_.)\*((a\_.) + (b\_.)\*(x\_)^(p\_.))]/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] := Simp[PolyLog[n + 1, c\*(a + b\*x)^p]/(e\*p), x] /; FreeQ[{a, b, c, d, e, n, p}, x] && EqQ[b\*d, a\*e]

### Rule 2440

Int[((a\_.) + Log[(c\_.)\*((d\_.) + (e\_.)\*(x\_)^(n\_.))]\*(b\_.))\*((f\_.) + Log[(h\_.)\*((i\_.) + (j\_.)\*(x\_)^(m\_.))]\*(g\_.))\*((k\_.) + (l\_.)\*(x\_)^(r\_.)), x\_Symbol] := Dist[1/l, Subst[Int[x^r\*(a + b\*Log[c\*(-((e\*k - d\*1)/1) + (e\*x)/1)^n])\*(f + g\*Log[h\*(-((j\*k - i\*1)/1) + (j\*x)/1)^m]), x], x, k + l\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]

### Rule 2434

Int[((((a\_.) + Log[(c\_.)\*((d\_.) + (e\_.)\*(x\_)^(n\_.))]\*(b\_.))\*((f\_.) + Log[(h\_.)\*((i\_.) + (j\_.)\*(x\_)^(m\_.))]\*(g\_.)))/(x\_), x\_Symbol] := Simp[Log[x]\*(a + b\*Log[c\*(d + e\*x)^n])\*(f + g\*Log[h\*(i + j\*x)^m]), x] + (-Dist[e\*g\*m, Int[(Log[x]\*(a + b\*Log[c\*(d + e\*x)^n])]/(d + e\*x), x], x] - Dist[b\*j\*n, Int[(Log[x]\*(f + g\*Log[h\*(i + j\*x)^m])]/(i + j\*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, m, n}, x] && EqQ[e\*i - d\*j, 0]

### Rule 2499

Int[(Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_)^(p\_.))\*((c\_.) + (d\_.)\*(x\_)^(q\_.))^(r\_.)]\*(s\_.) + Log[(i\_.)\*((g\_.) + (h\_.)\*(x\_)^(n\_.)]\*(t\_.))^(m\_.))/(j\_.) + (k\_.)\*(x\_)), x\_Symbol] := Simp[((s + t\*Log[i\*(g + h\*x)^n])^(m + 1)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r)/(k\*n\*t\*(m + 1)), x] + (-Dist[(b\*p\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(a + b\*x), x], x] - Dist[(d\*q\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(c + d\*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0] && EqQ[h\*j - g\*k, 0] && IGtQ[m, 0]

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] := Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] := Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int \frac{\left(A + B \log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(107c + 107dx)^3(ag + bgx)^4} dx = -\frac{2b^2B^2}{33076161(bc - ad)^3g^4(a + bx)^3} + \frac{37b^2B^2d}{44101548(bc - ad)^4g^4(a + bx)^2} - \frac{319b^2B^2d^2}{22050774(bc - ad)^5g^4(a + bx)}$$

**Mathematica [A]** time = 2.81633, size = 793, normalized size = 0.93

$$\frac{18B(30a^2b^3d^2(6Adx(c + dx)^2 + B(6c^2dx + 2c^3 - 3d^3x^3)) + 30a^3b^2d^3(2A(c + dx)^2 - Bdx(4c + 3dx)) - 15a^4bBd^4(2c + dx) + 15a^5B^2d^4)}{(107c + 107dx)^3(ag + bgx)^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/((a*g + b*g*x)^4*(c*i + d*
i*x)^3), x]
```

```
[Out] -(27*(2*A^2 - 2*A*B + B^2)*d^3*(b*c - a*d)^2*(a + b*x)^3 + 54*b*(8*A^2 - 18
*A*B + 19*B^2)*d^3*(b*c - a*d)*(a + b*x)^3*(c + d*x) + 4*b^2*(9*A^2 + 6*A*B
+ 2*B^2)*(b*c - a*d)^3*(c + d*x)^2 - 3*b^2*(54*A^2 + 66*A*B + 37*B^2)*d*(b
*c - a*d)^2*(a + b*x)*(c + d*x)^2 + 6*b^2*(108*A^2 + 282*A*B + 319*B^2)*d^2
*(b*c - a*d)*(a + b*x)^2*(c + d*x)^2 + 60*b^2*(18*A^2 + 12*A*B + 49*B^2)*d^
3*(a + b*x)^3*(c + d*x)^2*Log[a + b*x] + 6*B*(b*c - a*d)*(9*(2*A - B)*d^3*(
```

$$\begin{aligned}
& b*c - a*d)*(a + b*x)^3 + 18*b*(8*A - 9*B)*d^3*(a + b*x)^3*(c + d*x) + 4*b^2 \\
& *(3*A + B)*(b*c - a*d)^2*(c + d*x)^2 - 3*b^2*(18*A + 11*B)*d*(b*c - a*d)*(a \\
& + b*x)*(c + d*x)^2 + 6*b^2*(36*A + 47*B)*d^2*(a + b*x)^2*(c + d*x)^2)*\text{Log}[ \\
& (e*(a + b*x))/(c + d*x)] + 18*B*(3*a^5*B*d^5 - 15*a^4*b*B*d^4*(2*c + d*x) + \\
& 30*a^3*b^2*d^3*(2*A*(c + d*x)^2 - B*d*x*(4*c + 3*d*x)) + 30*a^2*b^3*d^2*(6 \\
& *A*d*x*(c + d*x)^2 + B*(2*c^3 + 6*c^2*d*x - 3*d^3*x^3)) + 15*a*b^4*d*(12*A* \\
& d^2*x^2*(c + d*x)^2 + B*c*(-c^3 + 4*c^2*d*x + 18*c*d^2*x^2 + 12*d^3*x^3)) + \\
& b^5*(60*A*d^3*x^3*(c + d*x)^2 + B*(2*c^5 - 5*c^4*d*x + 20*c^3*d^2*x^2 + 11 \\
& 0*c^2*d^3*x^3 + 100*c*d^4*x^4 + 20*d^5*x^5))*\text{Log}[(e*(a + b*x))/(c + d*x)]^2 \\
& + 360*b^2*B^2*d^3*(a + b*x)^3*(c + d*x)^2*\text{Log}[(e*(a + b*x))/(c + d*x)]^3 \\
& - 60*b^2*(18*A^2 + 12*A*B + 49*B^2)*d^3*(a + b*x)^3*(c + d*x)^2*\text{Log}[c + d*x \\
& ]/(108*(b*c - a*d)^6*g^4*i^3*(a + b*x)^3*(c + d*x)^2)
\end{aligned}$$

**Maple [B]** time = 0.059, size = 5731, normalized size = 6.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In]  $\text{int}((A+B*\ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x)$

[Out] result too large to display

**Maxima [B]** time = 7.14518, size = 12531, normalized size = 14.73

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In]  $\text{integrate}((A+B*\log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x, \text{algorithm}="maxima")$

[Out] 
$$\begin{aligned}
& -1/6*B^2*((60*b^4*d^4*x^4 + 2*b^4*c^4 - 13*a*b^3*c^3*d + 47*a^2*b^2*c^2*d^2 \\
& + 27*a^3*b*c*d^3 - 3*a^4*d^4 + 30*(3*b^4*c*d^3 + 5*a*b^3*d^4)*x^3 + 10*(2* \\
& b^4*c^2*d^2 + 23*a*b^3*c*d^3 + 11*a^2*b^2*d^4)*x^2 - 5*(b^4*c^3*d - 11*a*b^3 \\
& c^2*d^2 - 35*a^2*b^2*c*d^3 - 3*a^3*b*d^4)*x)/((b^8*c^5*d^2 - 5*a*b^7*c^4* \\
& d^3 + 10*a^2*b^6*c^3*d^4 - 10*a^3*b^5*c^2*d^5 + 5*a^4*b^4*c*d^6 - a^5*b^3*d \\
& ^7)*g^4*i^3*x^5 + (2*b^8*c^6*d - 7*a*b^7*c^5*d^2 + 5*a^2*b^6*c^4*d^3 + 10*a \\
& ^3*b^5*c^3*d^4 - 20*a^4*b^4*c^2*d^5 + 13*a^5*b^3*c*d^6 - 3*a^6*b^2*d^7)*g^4
\end{aligned}$$

$$\begin{aligned}
& *i^3*x^4 + (b^8*c^7 + a*b^7*c^6*d - 17*a^2*b^6*c^5*d^2 + 35*a^3*b^5*c^4*d^3 \\
& - 25*a^4*b^4*c^3*d^4 - a^5*b^3*c^2*d^5 + 9*a^6*b^2*c*d^6 - 3*a^7*b*d^7)*g^4 \\
& *i^3*x^3 + (3*a*b^7*c^7 - 9*a^2*b^6*c^6*d + a^3*b^5*c^5*d^2 + 25*a^4*b^4*c^4*d^3 \\
& - 35*a^5*b^3*c^3*d^4 + 17*a^6*b^2*c^2*d^5 - a^7*b*c*d^6 - a^8*d^7)*g^4 \\
& *i^3*x^2 + (3*a^2*b^6*c^7 - 13*a^3*b^5*c^6*d + 20*a^4*b^4*c^5*d^2 - 10*a^5 \\
& *b^3*c^4*d^3 - 5*a^6*b^2*c^3*d^4 + 7*a^7*b*c^2*d^5 - 2*a^8*c*d^6)*g^4*i^3*x \\
& + (a^3*b^5*c^7 - 5*a^4*b^4*c^6*d + 10*a^5*b^3*c^5*d^2 - 10*a^6*b^2*c^4*d^3 \\
& + 5*a^7*b*c^3*d^4 - a^8*c^2*d^5)*g^4*i^3 + 60*b^2*d^3*log(b*x + a)/((b^6 \\
& *c^6 - 6*a*b^5*c^5*d + 15*a^2*b^4*c^4*d^2 - 20*a^3*b^3*c^3*d^3 + 15*a^4*b^2 \\
& *c^2*d^4 - 6*a^5*b*c*d^5 + a^6*d^6)*g^4*i^3) - 60*b^2*d^3*log(d*x + c)/((b^6 \\
& *c^6 - 6*a*b^5*c^5*d + 15*a^2*b^4*c^4*d^2 - 20*a^3*b^3*c^3*d^3 + 15*a^4*b^2 \\
& *c^2*d^4 - 6*a^5*b*c*d^5 + a^6*d^6)*g^4*i^3))*log(b*e*x/(d*x + c) + a*e/(d \\
& *x + c))^2 - 1/3*A*B*((60*b^4*d^4*x^4 + 2*b^4*c^4 - 13*a*b^3*c^3*d + 47*a^2 \\
& *b^2*c^2*d^2 + 27*a^3*b*c*d^3 - 3*a^4*d^4 + 30*(3*b^4*c*d^3 + 5*a*b^3*d^4)* \\
& x^3 + 10*(2*b^4*c^2*d^2 + 23*a*b^3*c*d^3 + 11*a^2*b^2*d^4)*x^2 - 5*(b^4*c^3 \\
& *d - 11*a*b^3*c^2*d^2 - 35*a^2*b^2*c*d^3 - 3*a^3*b*d^4)*x)/((b^8*c^5*d^2 - \\
& 5*a*b^7*c^4*d^3 + 10*a^2*b^6*c^3*d^4 - 10*a^3*b^5*c^2*d^5 + 5*a^4*b^4*c*d^6 \\
& - a^5*b^3*d^7)*g^4*i^3*x^5 + (2*b^8*c^6*d - 7*a*b^7*c^5*d^2 + 5*a^2*b^6*c^4 \\
& *d^3 + 10*a^3*b^5*c^3*d^4 - 20*a^4*b^4*c^2*d^5 + 13*a^5*b^3*c*d^6 - 3*a^6*b^2 \\
& *d^7)*g^4*i^3*x^4 + (b^8*c^7 + a*b^7*c^6*d - 17*a^2*b^6*c^5*d^2 + 35*a^3 \\
& *b^5*c^4*d^3 - 25*a^4*b^4*c^3*d^4 - a^5*b^3*c^2*d^5 + 9*a^6*b^2*c*d^6 - 3*a^7 \\
& *b*d^7)*g^4*i^3*x^3 + (3*a*b^7*c^7 - 9*a^2*b^6*c^6*d + a^3*b^5*c^5*d^2 + \\
& 25*a^4*b^4*c^4*d^3 - 35*a^5*b^3*c^3*d^4 + 17*a^6*b^2*c^2*d^5 - a^7*b*c*d^6 - \\
& a^8*d^7)*g^4*i^3*x^2 + (3*a^2*b^6*c^7 - 13*a^3*b^5*c^6*d + 20*a^4*b^4*c^5 \\
& *d^2 - 10*a^5*b^3*c^4*d^3 - 5*a^6*b^2*c^3*d^4 + 7*a^7*b*c^2*d^5 - 2*a^8*c*d^6) \\
& *g^4*i^3*x + (a^3*b^5*c^7 - 5*a^4*b^4*c^6*d + 10*a^5*b^3*c^5*d^2 - 10*a^6 \\
& *b^2*c^4*d^3 + 5*a^7*b*c^3*d^4 - a^8*c^2*d^5)*g^4*i^3 + 60*b^2*d^3*log(b*x \\
& + a)/((b^6*c^6 - 6*a*b^5*c^5*d + 15*a^2*b^4*c^4*d^2 - 20*a^3*b^3*c^3*d^3 \\
& + 15*a^4*b^2*c^2*d^4 - 6*a^5*b*c*d^5 + a^6*d^6)*g^4*i^3) - 60*b^2*d^3*log(d \\
& *x + c)/((b^6*c^6 - 6*a*b^5*c^5*d + 15*a^2*b^4*c^4*d^2 - 20*a^3*b^3*c^3*d^3 \\
& + 15*a^4*b^2*c^2*d^4 - 6*a^5*b*c*d^5 + a^6*d^6)*g^4*i^3))*log(b*e*x/(d*x + \\
& c) + a*e/(d*x + c)) - 1/108*B^2*(6*(4*b^5*c^5 - 45*a*b^4*c^4*d + 360*a^2*b^3 \\
& *c^3*d^2 - 490*a^3*b^2*c^2*d^3 + 180*a^4*b*c*d^4 - 9*a^5*d^5 + 120*(b^5*c \\
& *d^4 - a*b^4*d^5)*x^4 + 120*(3*b^5*c^2*d^3 - 2*a*b^4*c*d^4 - a^2*b^3*d^5)*x^3 \\
& + 20*(11*b^5*c^3*d^2 + 21*a*b^4*c^2*d^3 - 39*a^2*b^3*c*d^4 + 7*a^3*b^2*d^5) \\
& *x^2 - 180*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)* \\
& x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 \\
& + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4) \\
& *x)*log(b*x + a)^2 - 180*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3 \\
& *a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a \\
& *b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3 \\
& *b^2*c*d^4)*x)*log(d*x + c)^2 - 5*(5*b^5*c^4*d - 108*a*b^4*c^3*d^2 + 78*a^2 \\
& *b^3*c^2*d^3 + 52*a^3*b^2*c*d^4 - 27*a^4*b*d^5)*x + 120*(b^5*d^5*x^5 + a^3 \\
& *b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c \\
& *d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5
\end{aligned}$$

$$\begin{aligned}
& )x^2 + (3a^2b^3c^2d^3 + 2a^3b^2cd^4)x \log(bx + a) - 120(b^5d^5x^5 + a^3b^2c^2d^3 + (2b^5cd^4 + 3ab^4d^5)x^4 + (b^5c^2d^3 + 6ab^4cd^4 + 3a^2b^3d^5)x^3 + (3ab^4c^2d^3 + 6a^2b^3cd^4 + a^3b^2d^5)x^2 + (3a^2b^3c^2d^3 + 2a^3b^2cd^4)x - 3(b^5d^5x^5 + a^3b^2c^2d^3 + (2b^5cd^4 + 3ab^4d^5)x^4 + (b^5c^2d^3 + 6ab^4cd^4 + 3a^2b^3d^5)x^3 + (3ab^4c^2d^3 + 6a^2b^3cd^4 + a^3b^2d^5)x^2 + (3a^2b^3c^2d^3 + 2a^3b^2cd^4)x) \log(bx + a)) \log(dx + c) \\
& ) \log(b^*e*x/(d*x + c) + a*e/(d*x + c)) / (a^3b^6c^8g^4i^3 - 6a^4b^5c^7dg^4i^3 + 15a^5b^4c^6d^2g^4i^3 - 20a^6b^3c^5d^3g^4i^3 + 15a^7b^2c^4d^4g^4i^3 - 6a^8b^2c^3d^5g^4i^3 + a^9c^2d^6g^4i^3 + (b^9c^6d^2g^4i^3 - 6ab^8c^5d^3g^4i^3 + 15a^2b^7c^4d^4g^4i^3 - 20a^3b^6c^3d^5g^4i^3 + 15a^4b^5c^2d^6g^4i^3 - 6a^5b^4c^1d^7g^4i^3 + a^6b^3d^8g^4i^3)x^5 + (2b^9c^7dg^4i^3 - 9ab^8c^6d^2g^4i^3 + 12a^2b^7c^5d^3g^4i^3 + 5a^3b^6c^4d^4g^4i^3 - 30a^4b^5c^3d^5g^4i^3 + 33a^5b^4c^2d^6g^4i^3 - 16a^6b^3cd^7g^4i^3 + 3a^7b^2d^8g^4i^3)x^4 + (b^9c^8g^4i^3 - 18a^2b^7c^6d^2g^4i^3 + 52a^3b^6c^5d^3g^4i^3 - 60a^4b^5c^4d^4g^4i^3 + 24a^5b^4c^3d^5g^4i^3 + 10a^6b^3c^2d^6g^4i^3 - 12a^7b^2cd^7g^4i^3 + 3a^8bd^8g^4i^3)x^3 + (3ab^8c^8g^4i^3 - 12a^2b^7c^7dg^4i^3 + 10a^3b^6c^6d^2g^4i^3 + 24a^4b^5c^5d^3g^4i^3 - 60a^5b^4c^4d^4g^4i^3 + 52a^6b^3c^3d^5g^4i^3 - 18a^7b^2c^2d^6g^4i^3 + a^9d^8g^4i^3)x^2 + (3a^2b^7c^8g^4i^3 - 16a^3b^6c^7dg^4i^3 + 33a^4b^5c^6d^2g^4i^3 - 30a^5b^4c^5d^3g^4i^3 + 5a^6b^3c^4d^4g^4i^3 + 12a^7b^2c^3d^5g^4i^3 - 9a^8b^2c^2d^6g^4i^3 + 2a^9cd^7g^4i^3)x) + (8b^5c^5 - 135ab^4c^4d + 2160a^2b^3c^3d^2 - 980a^3b^2c^2d^3 - 1080a^4b^2cd^4 + 27a^5d^5 + 2940(b^5cd^4 - ab^4d^5)x^4 + 30(159b^5c^2d^3 + 74ab^4cd^4 - 233a^2b^3d^5)x^3 + 360(b^5d^5x^5 + a^3b^2c^2d^3 + (2b^5cd^4 + 3ab^4d^5)x^4 + (b^5c^2d^3 + 6ab^4cd^4 + 3a^2b^3d^5)x^3 + (3ab^4c^2d^3 + 6a^2b^3cd^4 + a^3b^2d^5)x^2 + (3a^2b^3c^2d^3 + 2a^3b^2cd^4)x) \log(bx + a)^3 - 360(b^5d^5x^5 + a^3b^2c^2d^3 + (2b^5cd^4 + 3ab^4d^5)x^4 + (b^5c^2d^3 + 6ab^4cd^4 + 3a^2b^3d^5)x^3 + (3ab^4c^2d^3 + 6a^2b^3cd^4 + a^3b^2d^5)x^2 + (3a^2b^3c^2d^3 + 2a^3b^2cd^4)x) \log(bx + a)^2 - 360(b^5d^5x^5 + a^3b^2c^2d^3 + (2b^5cd^4 + 3ab^4d^5)x^4 + (b^5c^2d^3 + 6ab^4cd^4 + 3a^2b^3d^5)x^3 + (3ab^4c^2d^3 + 6a^2b^3cd^4 + a^3b^2d^5)x^2 + (3a^2b^3c^2d^3 + 2a^3b^2cd^4)x) \log(bx + a) \log(dx + c)^2 - 5(19b^5c^4d - 756ab^4c^3d^2 - 708a^2b^3c^2d^3 + 1256a^3b^2cd^4 + 189a^4
\end{aligned}$$

$$\begin{aligned}
& *b*d^5)*x + 2940*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*\log(b*x + a) - 60*(49*b^5*d^5*x^5 + 49*a^3*b^2*c^2*d^3 + 49*(2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + 49*(b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + 49*(3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + 18*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*\log(b*x + a)^2 + 49*(3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x - 12*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*\log(b*x + a))*\log(d*x + c))/(a^3*b^6*c^8*g^4*i^3 - 6*a^4*b^5*c^7*d*g^4*i^3 + 15*a^5*b^4*c^6*d^2*g^4*i^3 - 20*a^6*b^3*c^5*d^3*g^4*i^3 + 15*a^7*b^2*c^4*d^4*g^4*i^3 - 6*a^8*b*c^3*d^5*g^4*i^3 + a^9*c^2*d^6*g^4*i^3 + (b^9*c^6*d^2*g^4*i^3 - 6*a*b^8*c^5*d^3*g^4*i^3 + 15*a^2*b^7*c^4*d^4*g^4*i^3 - 20*a^3*b^6*c^3*d^5*g^4*i^3 + 15*a^4*b^5*c^2*d^6*g^4*i^3 - 6*a^5*b^4*c*d^7*g^4*i^3 + a^6*b^3*d^8*g^4*i^3)*x^5 + (2*b^9*c^7*d*g^4*i^3 - 9*a*b^8*c^6*d^2*g^4*i^3 + 12*a^2*b^7*c^5*d^3*g^4*i^3 + 5*a^3*b^6*c^4*d^4*g^4*i^3 - 30*a^4*b^5*c^3*d^5*g^4*i^3 + 33*a^5*b^4*c^2*d^6*g^4*i^3 - 16*a^6*b^3*c*d^7*g^4*i^3 + 3*a^7*b^2*d^8*g^4*i^3)*x^4 + (b^9*c^8*g^4*i^3 - 18*a^2*b^7*c^6*d^2*g^4*i^3 + 52*a^3*b^6*c^5*d^3*g^4*i^3 - 60*a^4*b^5*c^4*d^4*g^4*i^3 + 24*a^5*b^4*c^3*d^5*g^4*i^3 + 10*a^6*b^3*c^2*d^6*g^4*i^3 - 12*a^7*b^2*c*d^7*g^4*i^3 + 3*a^8*b*d^8*g^4*i^3)*x^3 + (3*a*b^8*c^8*g^4*i^3 - 12*a^2*b^7*c^7*d*g^4*i^3 + 10*a^3*b^6*c^6*d^2*g^4*i^3 + 24*a^4*b^5*c^5*d^3*g^4*i^3 - 60*a^5*b^4*c^4*d^4*g^4*i^3 + 52*a^6*b^3*c^3*d^5*g^4*i^3 - 18*a^7*b^2*c^2*d^6*g^4*i^3 + a^9*d^8*g^4*i^3)*x^2 + (3*a^2*b^7*c^8*g^4*i^3 - 16*a^3*b^6*c^7*d*g^4*i^3 + 33*a^4*b^5*c^6*d^2*g^4*i^3 - 30*a^5*b^4*c^5*d^3*g^4*i^3 + 5*a^6*b^3*c^4*d^4*g^4*i^3 + 12*a^7*b^2*c^3*d^5*g^4*i^3 - 9*a^8*b*c^2*d^6*g^4*i^3 + 2*a^9*c*d^7*g^4*i^3)*x)) - 1/6*A^2*((60*b^4*d^4*x^4 + 2*b^4*c^4 - 13*a*b^3*c^3*d + 47*a^2*b^2*c^2*d^2 + 27*a^3*b*c*d^3 - 3*a^4*d^4 + 30*(3*b^4*c*d^3 + 5*a*b^3*d^4)*x^3 + 10*(2*b^4*c^2*d^2 + 23*a*b^3*c*d^3 + 11*a^2*b^2*d^4)*x^2 - 5*(b^4*c^3*d - 11*a*b^3*c^2*d^2 - 35*a^2*b^2*c*d^3 - 3*a^3*b*d^4)*x)/((b^8*c^5*d^2 - 5*a*b^7*c^4*d^3 + 10*a^2*b^6*c^3*d^4 - 10*a^3*b^5*c^2*d^5 + 5*a^4*b^4*c*d^6 - a^5*b^3*d^7)*g^4*i^3*x^5 + (2*b^8*c^6*d - 7*a*b^7*c^5*d^2 + 5*a^2*b^6*c^4*d^3 + 10*a^3*b^5*c^3*d^4 - 20*a^4*b^4*c^2*d^5 + 13*a^5*b^3*c*d^6 - 3*a^6*b^2*d^7)*g^4*i^3*x^4 + (b^8*c^7 + a*b^7*c^6*d - 17*a^2*b^6*c^5*d^2 + 35*a^3*b^5*c^4*d^3 - 25*a^4*b^4*c^3*d^4 - a^5*b^3*c^2*d^5 + 9*a^6*b^2*c*d^6 - 3*a^7*b*d^7)*g^4*i^3*x^3 + (3*a*b^7*c^7 - 9*a^2*b^6*c^6*d + a^3*b^5*c^5*d^2 + 25*a^4*b^4*c^4*d^3 - 35*a^5*b^3*c^3*d^4 + 17*a^6*b^2*c^2*d^5 - a^7*b*c*d^6 - a^8*d^7)*g^4*i^3*x^2 + (3*a^2*b^6*c^7 - 13*a^3*b^5*c^6*d + 20*a^4*b^4*c^5*d^2 - 10*a^5*b^3*c^4*d^3 - 5*a^6*b^2*c^3*d^4 + 7*a^7*b*c^2*d^5 - 2*a^8*c*d^6)*g^4*i^3*x + (a^3*b^5*c^7 - 5*a^4*b^4*c^6*d + 10*a^5*b^3*c^5*d^2 - 10*a^6*b^2*c^4*d^3 + 5*a^7*b*c^3*d^4 - a^8*c^2*d^5)*g^4*i^3) + 60*b^2*d^3*\log(b*x + a)/((b^6*c^6 - 6*a*b^5*c^5*d + 15*a^2*b^4
\end{aligned}$$

$$\begin{aligned}
& *c^4*d^2 - 20*a^3*b^3*c^3*d^3 + 15*a^4*b^2*c^2*d^4 - 6*a^5*b*c*d^5 + a^6*d^6)*g^4*i^3) - 60*b^2*d^3*\log(d*x + c)/((b^6*c^6 - 6*a*b^5*c^5*d + 15*a^2*b^4*c^4*d^2 - 20*a^3*b^3*c^3*d^3 + 15*a^4*b^2*c^2*d^4 - 6*a^5*b*c*d^5 + a^6*d^6)*g^4*i^3)) - 1/18*(4*b^5*c^5 - 45*a*b^4*c^4*d + 360*a^2*b^3*c^3*d^2 - 490*a^3*b^2*c^2*d^3 + 180*a^4*b*c*d^4 - 9*a^5*d^5 + 120*(b^5*c*d^4 - a*b^4*d^5)*x^4 + 120*(3*b^5*c^2*d^3 - 2*a*b^4*c*d^4 - a^2*b^3*d^5)*x^3 + 20*(11*b^5*c^3*d^2 + 21*a*b^4*c^2*d^3 - 39*a^2*b^3*c*d^4 + 7*a^3*b^2*d^5)*x^2 - 180*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*\log(b*x + a)^2 - 180*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*\log(d*x + c)^2 - 5*(5*b^5*c^4*d - 108*a*b^4*c^3*d^2 + 78*a^2*b^3*c^2*d^3 + 52*a^3*b^2*c*d^4 - 27*a^4*b*d^5)*x + 120*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*\log(b*x + a) - 120*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x - 3*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*\log(b*x + a))*\log(d*x + c))*A*B/(a^3*b^6*c^8*g^4*i^3 - 6*a^4*b^5*c^7*d*g^4*i^3 + 15*a^5*b^4*c^6*d^2*g^4*i^3 - 20*a^6*b^3*c^5*d^3*g^4*i^3 + 15*a^7*b^2*c^4*d^4*g^4*i^3 - 6*a^8*b*c^3*d^5*g^4*i^3 + a^9*c^2*d^6*g^4*i^3 + (b^9*c^6*d^2*g^4*i^3 - 6*a*b^8*c^5*d^3*g^4*i^3 + 15*a^2*b^7*c^4*d^4*g^4*i^3 - 20*a^3*b^6*c^3*d^5*g^4*i^3 + 15*a^4*b^5*c^2*d^6*g^4*i^3 - 6*a^5*b^4*c*d^7*g^4*i^3 + a^6*b^3*d^8*g^4*i^3)*x^5 + (2*b^9*c^7*d*g^4*i^3 - 9*a*b^8*c^6*d^2*g^4*i^3 + 12*a^2*b^7*c^5*d^3*g^4*i^3 + 5*a^3*b^6*c^4*d^4*g^4*i^3 - 30*a^4*b^5*c^3*d^5*g^4*i^3 + 33*a^5*b^4*c^2*d^6*g^4*i^3 - 16*a^6*b^3*c*d^7*g^4*i^3 + 3*a^7*b^2*d^8*g^4*i^3)*x^4 + (b^9*c^8*g^4*i^3 - 18*a^2*b^7*c^6*d^2*g^4*i^3 + 52*a^3*b^6*c^5*d^3*g^4*i^3 - 60*a^4*b^5*c^4*d^4*g^4*i^3 + 24*a^5*b^4*c^3*d^5*g^4*i^3 + 10*a^6*b^3*c^2*d^6*g^4*i^3 - 12*a^7*b^2*c*d^7*g^4*i^3 + 3*a^8*b*d^8*g^4*i^3)*x^3 + (3*a*b^8*c^8*g^4*i^3 - 12*a^2*b^7*c^7*d*g^4*i^3 + 10*a^3*b^6*c^6*d^2*g^4*i^3 + 24*a^4*b^5*c^5*d^3*g^4*i^3 - 60*a^5*b^4*c^4*d^4*g^4*i^3 + 52*a^6*b^3*c^3*d^5*g^4*i^3 - 18*a^7*b^2*c^2*d^6*g^4*i^3 + a^9*d^8*g^4*i^3)*x^2 + (3*a^2*b^7*c^8*g^4*i^3 - 16*a^3*b^6*c^7*d*g^4*i^3 + 33*a^4*b^5*c^6*d^2*g^4*i^3 - 30*a^5*b^4*c^5*d^3*g^4*i^3 + 5*a^6*b^3*c^4*d^4*g^4*i^3 + 12*a^7*b^2*c^3*d^5*g^4*i^3 - 9*a^8*b*c^2*d^6*g^4*i^3 + 2*a^9*c*d^7*g^4*i^3)*x)
\end{aligned}$$

**Fricas [B]** time = 0.804615, size = 4744, normalized size = 5.57

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x, alg
orithm="fricas")
```

```
[Out] -1/108*(4*(9*A^2 + 6*A*B + 2*B^2)*b^5*c^5 - 135*(2*A^2 + 2*A*B + B^2)*a*b^4
*c^4*d + 1080*(A^2 + 2*A*B + 2*B^2)*a^2*b^3*c^3*d^2 - 20*(18*A^2 + 147*A*B
+ 49*B^2)*a^3*b^2*c^2*d^3 - 540*(A^2 - 2*A*B + 2*B^2)*a^4*b*c*d^4 + 27*(2*A
^2 - 2*A*B + B^2)*a^5*d^5 + 60*((18*A^2 + 12*A*B + 49*B^2)*b^5*c*d^4 - (18*
A^2 + 12*A*B + 49*B^2)*a*b^4*d^5)*x^4 + 30*(3*(18*A^2 + 24*A*B + 53*B^2)*b^
5*c^2*d^3 + 2*(18*A^2 - 24*A*B + 37*B^2)*a*b^4*c*d^4 - (90*A^2 + 24*A*B + 2
33*B^2)*a^2*b^3*d^5)*x^3 + 360*(B^2*b^5*d^5*x^5 + B^2*a^3*b^2*c^2*d^3 + (2*
B^2*b^5*c*d^4 + 3*B^2*a*b^4*d^5)*x^4 + (B^2*b^5*c^2*d^3 + 6*B^2*a*b^4*c*d^4
+ 3*B^2*a^2*b^3*d^5)*x^3 + (3*B^2*a*b^4*c^2*d^3 + 6*B^2*a^2*b^3*c*d^4 + B^
2*a^3*b^2*d^5)*x^2 + (3*B^2*a^2*b^3*c^2*d^3 + 2*B^2*a^3*b^2*c*d^4)*x)*log((
b*e*x + a*e)/(d*x + c))^3 + 10*(2*(18*A^2 + 66*A*B + 85*B^2)*b^5*c^3*d^2 +
3*(126*A^2 + 84*A*B + 307*B^2)*a*b^4*c^2*d^3 - 12*(18*A^2 + 39*A*B + 49*B^2
)*a^2*b^3*c*d^4 - (198*A^2 - 84*A*B + 503*B^2)*a^3*b^2*d^5)*x^2 + 18*(20*(3
*A*B + B^2)*b^5*d^5*x^5 + 2*B^2*b^5*c^5 - 15*B^2*a*b^4*c^4*d + 60*B^2*a^2*b
^3*c^3*d^2 + 60*A*B*a^3*b^2*c^2*d^3 - 30*B^2*a^4*b*c*d^4 + 3*B^2*a^5*d^5 +
20*(9*A*B*a*b^4*d^5 + (6*A*B + 5*B^2)*b^5*c*d^4)*x^4 + 10*((6*A*B + 11*B^2)
*b^5*c^2*d^3 + 18*(2*A*B + B^2)*a*b^4*c*d^4 + 9*(2*A*B - B^2)*a^2*b^3*d^5)*
x^3 + 10*(2*B^2*b^5*c^3*d^2 + 36*A*B*a^2*b^3*c*d^4 + 9*(2*A*B + 3*B^2)*a*b^
4*c^2*d^3 + 3*(2*A*B - 3*B^2)*a^3*b^2*d^5)*x^2 - 5*(B^2*b^5*c^4*d - 12*B^2*
a*b^4*c^3*d^2 + 3*B^2*a^4*b*d^5 - 36*(A*B + B^2)*a^2*b^3*c^2*d^3 - 24*(A*B
- B^2)*a^3*b^2*c*d^4)*x)*log((b*e*x + a*e)/(d*x + c))^2 - 5*((18*A^2 + 30*A
*B + 19*B^2)*b^5*c^4*d - 108*(2*A^2 + 6*A*B + 7*B^2)*a*b^4*c^3*d^2 - 12*(36
*A^2 - 39*A*B + 59*B^2)*a^2*b^3*c^2*d^3 + 8*(72*A^2 + 39*A*B + 157*B^2)*a^3
*b^2*c*d^4 + 27*(2*A^2 - 6*A*B + 7*B^2)*a^4*b*d^5)*x + 6*(10*(18*A^2 + 12*A
*B + 49*B^2)*b^5*d^5*x^5 + 180*A^2*a^3*b^2*c^2*d^3 + 4*(3*A*B + B^2)*b^5*c^
5 - 45*(2*A*B + B^2)*a*b^4*c^4*d + 360*(A*B + B^2)*a^2*b^3*c^3*d^2 - 180*(A
*B - B^2)*a^4*b*c*d^4 + 9*(2*A*B - B^2)*a^5*d^5 + 10*(2*(18*A^2 + 30*A*B +
55*B^2)*b^5*c*d^4 + 27*(2*A^2 + 5*B^2)*a*b^4*d^5)*x^4 + 10*((18*A^2 + 66*A*
B + 85*B^2)*b^5*c^2*d^3 + 54*(2*A^2 + 2*A*B + 5*B^2)*a*b^4*c*d^4 + 27*(2*A^
2 - 2*A*B + 5*B^2)*a^2*b^3*d^5)*x^3 + 10*(2*(6*A*B + 11*B^2)*b^5*c^3*d^2 +
27*(2*A^2 + 6*A*B + 7*B^2)*a*b^4*c^2*d^3 + 108*(A^2 + 2*B^2)*a^2*b^3*c*d^4
+ 9*(2*A^2 - 6*A*B + 7*B^2)*a^3*b^2*d^5)*x^2 - 5*((6*A*B + 5*B^2)*b^5*c^4*d
- 36*(2*A*B + 3*B^2)*a*b^4*c^3*d^2 - 108*(A^2 + 2*A*B + 2*B^2)*a^2*b^3*c^2
*d^3 - 72*(A^2 - 2*A*B + 2*B^2)*a^3*b^2*c*d^4 + 9*(2*A*B - 3*B^2)*a^4*b*d^5
)*x)*log((b*e*x + a*e)/(d*x + c)))/((b^9*c^6*d^2 - 6*a*b^8*c^5*d^3 + 15*a^2
```



```

*b^7*c^4*d^4 - 20*a^3*b^6*c^3*d^5 + 15*a^4*b^5*c^2*d^6 - 6*a^5*b^4*c*d^7 +
a^6*b^3*d^8)*g^4*i^3*x^5 + (2*b^9*c^7*d - 9*a*b^8*c^6*d^2 + 12*a^2*b^7*c^5*
d^3 + 5*a^3*b^6*c^4*d^4 - 30*a^4*b^5*c^3*d^5 + 33*a^5*b^4*c^2*d^6 - 16*a^6*
b^3*c*d^7 + 3*a^7*b^2*d^8)*g^4*i^3*x^4 + (b^9*c^8 - 18*a^2*b^7*c^6*d^2 + 52
*a^3*b^6*c^5*d^3 - 60*a^4*b^5*c^4*d^4 + 24*a^5*b^4*c^3*d^5 + 10*a^6*b^3*c^2
*d^6 - 12*a^7*b^2*c*d^7 + 3*a^8*b*d^8)*g^4*i^3*x^3 + (3*a*b^8*c^8 - 12*a^2*
b^7*c^7*d + 10*a^3*b^6*c^6*d^2 + 24*a^4*b^5*c^5*d^3 - 60*a^5*b^4*c^4*d^4 +
52*a^6*b^3*c^3*d^5 - 18*a^7*b^2*c^2*d^6 + a^9*d^8)*g^4*i^3*x^2 + (3*a^2*b^7
*c^8 - 16*a^3*b^6*c^7*d + 33*a^4*b^5*c^6*d^2 - 30*a^5*b^4*c^5*d^3 + 5*a^6*b
^3*c^4*d^4 + 12*a^7*b^2*c^3*d^5 - 9*a^8*b*c^2*d^6 + 2*a^9*c*d^7)*g^4*i^3*x
+ (a^3*b^6*c^8 - 6*a^4*b^5*c^7*d + 15*a^5*b^4*c^6*d^2 - 20*a^6*b^3*c^5*d^3
+ 15*a^7*b^2*c^4*d^4 - 6*a^8*b*c^3*d^5 + a^9*c^2*d^6)*g^4*i^3)

```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**4/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B \log\left(\frac{bx+a}{dx+c}\right) + A\right)^2}{(bgx + ag)^4 (dix + ci)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x, alg
orithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/((b*g*x + a*g)^4*(d*i*x + c*
i)^3), x)
```

$$3.108 \quad \int (ag + bgx)^3 (ci + dix) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx$$

**Optimal.** Leaf size=223

$$\frac{g^3 i(a+bx)^4 (bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A - Bn \right)}{20b^2} + \frac{g^3 i(a+bx)^4 (c+dx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{5b} + \frac{Bg^3 \ln(a+bx)^2 (bc-ad)}{40b^2 d^2}$$

[Out]  $-(B*(b*c - a*d)^4*g^3*i*n*x)/(20*b*d^3) + (B*(b*c - a*d)^3*g^3*i*n*(a + b*x)^2)/(40*b^2*d^2) - (B*(b*c - a*d)^2*g^3*i*n*(a + b*x)^3)/(60*b^2*d) + (g^3*i*(a + b*x)^4*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(5*b) + ((b*c - a*d)*g^3*i*(a + b*x)^4*(A - B*n + B*Log[e*((a + b*x)/(c + d*x))^n]))/(20*b^2) + (B*(b*c - a*d)^5*g^3*i*n*Log[c + d*x])/(20*b^2*d^4)$

**Rubi [A]** time = 0.385909, antiderivative size = 243, normalized size of antiderivative = 1.09, number of steps used = 10, number of rules used = 4, integrand size = 41,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.098$ , Rules used = {2528, 2525, 12, 43}

$$\frac{g^3 i(a+bx)^4 (bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{4b^2} + \frac{dg^3 i(a+bx)^5 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{5b^2} + \frac{Bg^3 \ln(a+bx)^2 (bc-ad)^3}{40b^2 d^2} + \frac{Bg^3}{40b^2 d^2}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[(a*g + b*g*x)^3*(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]$

[Out]  $-(B*(b*c - a*d)^4*g^3*i*n*x)/(20*b*d^3) + (B*(b*c - a*d)^3*g^3*i*n*(a + b*x)^2)/(40*b^2*d^2) - (B*(b*c - a*d)^2*g^3*i*n*(a + b*x)^3)/(60*b^2*d) - (B*(b*c - a*d)*g^3*i*n*(a + b*x)^4)/(20*b^2) + ((b*c - a*d)*g^3*i*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*b^2) + (d*g^3*i*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(5*b^2) + (B*(b*c - a*d)^5*g^3*i*n*Log[c + d*x])/(20*b^2*d^4)$

### Rule 2528

$\text{Int}[(a_. + \text{Log}[c_.*(\text{RFx}_.)^{(p_.)}]*(b_.))^{(n_.)}*(\text{RGx}_.), x\_Symbol] := \text{With}[\{u = \text{ExpandIntegrand}[(a + b*\text{Log}[c*\text{RFx}^p])^n, \text{RGx}, x]\}, \text{Int}[u, x] /; \text{SumQ}[u]] /; \text{FreeQ}[\{a, b, c, p\}, x] \&\& \text{RationalFunctionQ}[\text{RFx}, x] \&\& \text{RationalFunctionQ}[\text{RGx}, x] \&\& \text{IGtQ}[n, 0]$

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_) /; FreeQ[b, x]]
```

### Rule 43

```
Int[((a_.) + (b_.)*(x_.))^(m_.)*((c_.) + (d_.)*(x_.))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && LeQ[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

### Rubi steps

$$\begin{aligned}
 \int (108c + 108dx)(ag + bgx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx &= \int \left( \frac{108(bc - ad)(ag + bgx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b} + \dots \right) dx \\
 &= \frac{(108(bc - ad)) \int (ag + bgx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx}{b} \\
 &= \frac{27(bc - ad)g^3(a + bx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2} + \frac{108dg^3}{b} \\
 &= \frac{27(bc - ad)g^3(a + bx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2} + \frac{108dg^3}{b} \\
 &= \frac{27(bc - ad)g^3(a + bx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2} + \frac{108dg^3}{b} \\
 &= -\frac{27B(bc - ad)^4 g^3 nx}{5bd^3} + \frac{27B(bc - ad)^3 g^3 n(a + bx)^2}{10b^2 d^2} - \frac{9B}{b}
 \end{aligned}$$

**Mathematica [A]** time = 0.250617, size = 269, normalized size = 1.21

$$g^3 i \left( 24d(a+bx)^5 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right) + 30(a+bx)^4(bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right) - \frac{5Bn(bc-ad)^2(3d^2(a+bx)^2(ad-bc)+6bdx}{120} \right)$$

120

Antiderivative was successfully verified.

[In] Integrate[(a\*g + b\*g\*x)^3\*(c\*i + d\*i\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]),x]

[Out] (g^3\*i\*(30\*(b\*c - a\*d)\*(a + b\*x)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 24\*d\*(a + b\*x)^5\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - (5\*B\*(b\*c - a\*d)^2\*n\*(6\*b\*d\*(b\*c - a\*d)^2\*x + 3\*d^2\*(-(b\*c) + a\*d)\*(a + b\*x)^2 + 2\*d^3\*(a + b\*x)^3 - 6\*(b\*c - a\*d)^3\*Log[c + d\*x]))/d^4 + (2\*B\*(b\*c - a\*d)\*n\*(12\*b\*d\*(b\*c - a\*d)^3\*x - 6\*d^2\*(b\*c - a\*d)^2\*(a + b\*x)^2 + 4\*d^3\*(b\*c - a\*d)\*(a + b\*x)^3 - 3\*d^4\*(a + b\*x)^4 - 12\*(b\*c - a\*d)^4\*Log[c + d\*x]))/d^4)/(120\*b^2)

**Maple [F]** time = 0.531, size = 0, normalized size = 0.

$$\int (bgx + ag)^3 (dix + ci) \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^3\*(d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n)),x)

[Out] int((b\*g\*x+a\*g)^3\*(d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n)),x)

**Maxima [B]** time = 1.40488, size = 1509, normalized size = 6.77

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(d\*i\*x+c\*i)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n)),x, algorithm="maxima")

[Out] 1/5\*B\*b^3\*d\*g^3\*i\*x^5\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n) + 1/5\*A\*b^3\*d\*g^3\*i\*x^5 + 1/4\*B\*b^3\*c\*g^3\*i\*x^4\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n) +

$$\begin{aligned} & 3/4*B*a*b^2*d*g^3*i*x^4*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/4*A*b^3*c*g^3*i*x^4 + 3/4*A*a*b^2*d*g^3*i*x^4 + B*a*b^2*c*g^3*i*x^3*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + B*a^2*b*d*g^3*i*x^3*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*a*b^2*c*g^3*i*x^3 + A*a^2*b*d*g^3*i*x^3 + 3/2*B*a^2*b*c*g^3*i*x^2*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/2*B*a^3*d*g^3*i*x^2*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/2*A*a^2*b*c*g^3*i*x^2 + 1/2*A*a^3*d*g^3*i*x^2 + 1/60*B*b^3*d*g^3*i*n*(12*a^5*\log(b*x + a)/b^5 - 12*c^5*\log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4)) - 1/24*B*b^3*c*g^3*i*n*(6*a^4*\log(b*x + a)/b^4 - 6*c^4*\log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) - 1/8*B*a*b^2*d*g^3*i*n*(6*a^4*\log(b*x + a)/b^4 - 6*c^4*\log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + 1/2*B*a*b^2*c*g^3*i*n*(2*a^3*\log(b*x + a)/b^3 - 2*c^3*\log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) + 1/2*B*a^2*b*d*g^3*i*n*(2*a^3*\log(b*x + a)/b^3 - 2*c^3*\log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 3/2*B*a^2*b*c*g^3*i*n*(a^2*\log(b*x + a)/b^2 - c^2*\log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) - 1/2*B*a^3*d*g^3*i*n*(a^2*\log(b*x + a)/b^2 - c^2*\log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + B*a^3*c*g^3*i*n*(a*\log(b*x + a)/b - c*\log(d*x + c)/d) + B*a^3*c*g^3*i*x*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*a^3*c*g^3*i*x \end{aligned}$$

**Fricas [B]** time = 0.847657, size = 1501, normalized size = 6.73

$$24 Ab^5 d^5 g^3 i x^5 + 6 (5 Ba^4 bcd^4 - Ba^5 d^5) g^3 i n \log (bx + a) + 6 (Bb^5 c^5 - 5 Bab^4 c^4 d + 10 Ba^2 b^3 c^3 d^2 - 10 Ba^3 b^2 c^2 d^3) g^3 i n \log$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, alg
orithm="fricas")
```

```
[Out] 1/120*(24*A*b^5*d^5*g^3*i*x^5 + 6*(5*B*a^4*b*c*d^4 - B*a^5*d^5)*g^3*i*n*log
(b*x + a) + 6*(B*b^5*c^5 - 5*B*a*b^4*c^4*d + 10*B*a^2*b^3*c^3*d^2 - 10*B*a^
3*b^2*c^2*d^3)*g^3*i*n*log(d*x + c) - 6*((B*b^5*c*d^4 - B*a*b^4*d^5)*g^3*i*
n - 5*(A*b^5*c*d^4 + 3*A*a*b^4*d^5)*g^3*i)*x^4 - 2*((B*b^5*c^2*d^3 + 10*B*a
*b^4*c*d^4 - 11*B*a^2*b^3*d^5)*g^3*i*n - 60*(A*a*b^4*c*d^4 + A*a^2*b^3*d^5)
*g^3*i)*x^3 + 3*((B*b^5*c^3*d^2 - 5*B*a*b^4*c^2*d^3 - 5*B*a^2*b^3*c*d^4 + 9
*B*a^3*b^2*d^5)*g^3*i*n + 20*(3*A*a^2*b^3*c*d^4 + A*a^3*b^2*d^5)*g^3*i)*x^2
+ 6*(20*A*a^3*b^2*c*d^4*g^3*i - (B*b^5*c^4*d - 5*B*a*b^4*c^3*d^2 + 10*B*a^
2*b^3*c^2*d^3 - 5*B*a^3*b^2*c*d^4 - B*a^4*b*d^5)*g^3*i*n)*x + 6*(4*B*b^5*d^
```

$$5g^{3ix^5} + 20Ba^3b^2cd^4g^{3ix} + 5(Bb^5cd^4 + 3Ba^2b^4d^5)g^{3ix^4} + 20(Bab^4cd^4 + Ba^2b^3d^5)g^{3ix^3} + 10(3Ba^2b^3cd^4 + Ba^3b^2d^5)g^{3ix^2} \log(e) + 6(4Bb^5d^5g^{3inx^5} + 20Ba^3b^2cd^4g^{3inx} + 5(Bb^5cd^4 + 3Ba^2b^4d^5)g^{3inx^4} + 20(Bab^4cd^4 + Ba^2b^3d^5)g^{3inx^3} + 10(3Ba^2b^3cd^4 + Ba^3b^2d^5)g^{3inx^2}) \log((bx+a)/(dx+c)) / (b^2d^4)$$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*\*3\*(d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n)),x)

[Out] Timed out

**Giac [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(d\*i\*x+c\*i)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n)),x, algorithm="giac")

[Out] Timed out

$$3.109 \quad \int (ag + bgx)^2 (ci + dix) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx$$

**Optimal.** Leaf size=190

$$\frac{g^2 i(a+bx)^3 (bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A - Bn \right)}{12b^2} + \frac{g^2 i(a+bx)^3 (c+dx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{4b} - \frac{Bg^2 i n (bc-ad)^4 \log(c+dx)}{12b^2 d^3}$$

[Out] (B\*(b\*c - a\*d)^3\*g^2\*i\*n\*x)/(12\*b\*d^2) - (B\*(b\*c - a\*d)^2\*g^2\*i\*n\*(a + b\*x)^2)/(24\*b^2\*d) + (g^2\*i\*(a + b\*x)^3\*(c + d\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(4\*b) + ((b\*c - a\*d)\*g^2\*i\*(a + b\*x)^3\*(A - B\*n + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(12\*b^2) - (B\*(b\*c - a\*d)^4\*g^2\*i\*n\*Log[c + d\*x])/(12\*b^2\*d^3)

**Rubi [A]** time = 0.315728, antiderivative size = 210, normalized size of antiderivative = 1.11, number of steps used = 10, number of rules used = 4, integrand size = 41,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.098$ , Rules used = {2528, 2525, 12, 43}

$$\frac{g^2 i(a+bx)^3 (bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{3b^2} + \frac{dg^2 i(a+bx)^4 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{4b^2} - \frac{Bg^2 i n (bc-ad)^4 \log(c+dx)}{12b^2 d^3}$$

Antiderivative was successfully verified.

[In] Int[(a\*g + b\*g\*x)^2\*(c\*i + d\*i\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]),x]

[Out] (B\*(b\*c - a\*d)^3\*g^2\*i\*n\*x)/(12\*b\*d^2) - (B\*(b\*c - a\*d)^2\*g^2\*i\*n\*(a + b\*x)^2)/(24\*b^2\*d) - (B\*(b\*c - a\*d)\*g^2\*i\*n\*(a + b\*x)^3)/(12\*b^2) + ((b\*c - a\*d)\*g^2\*i\*(a + b\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(3\*b^2) + (d\*g^2\*i\*(a + b\*x)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(4\*b^2) - (B\*(b\*c - a\*d)^4\*g^2\*i\*n\*Log[c + d\*x])/(12\*b^2\*d^3)

### Rule 2528

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^n]\*(RGx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_) /; FreeQ[b, x]]
```

### Rule 43

```
Int[((a_.) + (b_.)*(x_.))^(m_.)*((c_.) + (d_.)*(x_.))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && LeQ[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

### Rubi steps

$$\begin{aligned}
 \int (109c + 109dx)(ag + bgx)^2 \left( A + B \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) \right) dx &= \int \left( \frac{109(bc - ad)(ag + bgx)^2 \left( A + B \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) \right)}{b} + \dots \right) dx \\
 &= \frac{(109(bc - ad)) \int (ag + bgx)^2 \left( A + B \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) \right) dx}{b} + \dots \\
 &= \frac{109(bc - ad)g^2(a + bx)^3 \left( A + B \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) \right)}{3b^2} + \frac{109dg^2}{\dots} \\
 &= \frac{109(bc - ad)g^2(a + bx)^3 \left( A + B \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) \right)}{3b^2} + \frac{109dg^2}{\dots} \\
 &= \frac{109(bc - ad)g^2(a + bx)^3 \left( A + B \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) \right)}{3b^2} + \frac{109dg^2}{\dots} \\
 &= \frac{109B(bc - ad)^3 g^2 nx}{12bd^2} - \frac{109B(bc - ad)^2 g^2 n(a + bx)^2}{24b^2 d} - \frac{109B}{\dots}
 \end{aligned}$$



**Mathematica [A]** time = 0.16844, size = 225, normalized size = 1.18

$$\frac{g^{2i} \left( 6d(a+bx)^4 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right) + 8(a+bx)^3(bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right) + \frac{4Bn(bc-ad)^2(2bdx(bc-ad)-2(bc-ad)^2 \log \left( \frac{a+bx}{c+dx} \right))}{d^3} \right)}{24b^2}$$

Antiderivative was successfully verified.

[In] Integrate[(a\*g + b\*g\*x)^2\*(c\*i + d\*i\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]),x]

[Out] (g^2\*i\*(8\*(b\*c - a\*d)\*(a + b\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 6\*d\*(a + b\*x)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + (4\*B\*(b\*c - a\*d)^2\*n\*(2\*b\*d\*(b\*c - a\*d)\*x - d^2\*(a + b\*x)^2 - 2\*(b\*c - a\*d)^2\*Log[c + d\*x]))/d^3 - (B\*(b\*c - a\*d)\*n\*(6\*b\*d\*(b\*c - a\*d)^2\*x + 3\*d^2\*(-(b\*c) + a\*d)\*(a + b\*x)^2 + 2\*d^3\*(a + b\*x)^3 - 6\*(b\*c - a\*d)^3\*Log[c + d\*x]))/d^3)/(24\*b^2)

**Maple [F]** time = 0.528, size = 0, normalized size = 0.

$$\int (bgx + ag)^2 (dix + ci) \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n)),x)

[Out] int((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n)),x)

**Maxima [B]** time = 1.37145, size = 999, normalized size = 5.26

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n)),x, algorithm="maxima")

[Out] 1/4\*B\*b^2\*d\*g^2\*i\*x^4\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n) + 1/4\*A\*b^2\*d\*g^2\*i\*x^4 + 1/3\*B\*b^2\*c\*g^2\*i\*x^3\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n) +

$$\begin{aligned}
& \frac{2}{3}B^2a^2b^2d^2g^{2i}x^3\log(e^{(bx/(dx+c) + a/(dx+c))^n}) + \frac{1}{3}A^2b^2c^2g^{2i}x^3 + \frac{2}{3}A^2b^2d^2g^{2i}x^3 + B^2a^2b^2c^2g^{2i}x^2\log(e^{(bx/(dx+c) + a/(dx+c))^n}) \\
& + \frac{1}{2}B^2a^2d^2g^{2i}x^2\log(e^{(bx/(dx+c) + a/(dx+c))^n}) + A^2a^2b^2c^2g^{2i}x^2 + \frac{1}{2}A^2a^2d^2g^{2i}x^2 - \frac{1}{24}B^2b^2d^2g^{2i}n(6a^4\log(bx+a)/b^4 - 6c^4\log(dx+c)/d^4 + (2(b^3cd^2 - ab^2d^3) \\
& *x^3 - 3(b^3c^2d - a^2bd^3)*x^2 + 6(b^3c^3 - a^3d^3)*x)/(b^3d^3)) \\
& + \frac{1}{6}B^2b^2c^2g^{2i}n(2a^3\log(bx+a)/b^3 - 2c^3\log(dx+c)/d^3 - ((b^2cd - ab*d^2)*x^2 - 2(b^2c^2 - a^2d^2)*x)/(b^2d^2)) + \frac{1}{3}B^2a^2b^2d^2g^{2i}n \\
& *n(2a^3\log(bx+a)/b^3 - 2c^3\log(dx+c)/d^3 - ((b^2cd - ab*d^2)*x^2 - 2(b^2c^2 - a^2d^2)*x)/(b^2d^2)) - B^2a^2b^2c^2g^{2i}n(a^2\log(bx+a)/b^2 - c^2\log(dx+c)/d^2 + (bc - ad)*x/(bd)) - \frac{1}{2}B^2a^2d^2g^{2i}n \\
& *n(a^2\log(bx+a)/b^2 - c^2\log(dx+c)/d^2 + (bc - ad)*x/(bd)) + B^2a^2c^2g^{2i}n(a\log(bx+a)/b - c\log(dx+c)/d) + B^2a^2c^2g^{2i}x\log(e^{(bx/(dx+c) + a/(dx+c))^n}) + A^2a^2c^2g^{2i}x
\end{aligned}$$

**Fricas [B]** time = 0.659294, size = 1107, normalized size = 5.83

$$6Ab^4d^4g^{2i}x^4 + 2(4Ba^3bcd^3 - Ba^4d^4)g^{2i}x^3 \log(bx+a) - 2(Bb^4c^4 - 4Bab^3c^3d + 6Ba^2b^2c^2d^2)g^{2i}x^2 \log(dx+c) - 2((Bb^4c^4 - 4Bab^3c^3d + 6Ba^2b^2c^2d^2)g^{2i}x \log(dx+c) - 2(Bb^4c^4 - 4Bab^3c^3d + 6Ba^2b^2c^2d^2)g^{2i}x^2 \log(dx+c) - \dots)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)\*(A+B\*log(e^((b\*x+a)/(d\*x+c))^n)),x, algorithm="fricas")

[Out]  $\frac{1}{24}(6A^2b^4d^4g^{2i}x^4 + 2(4B^2a^3b^2cd^3 - B^2a^4d^4)g^{2i}x^3 \log(bx+a) - 2(B^2b^4c^4 - 4B^2ab^3c^3d + 6B^2a^2b^2c^2d^2)g^{2i}x^2 \log(dx+c) - 2((B^2b^4c^4d^3 - B^2ab^3d^4)g^{2i}x^2 \log(bx+a) - 4(A^2b^4cd^3 + 2A^2ab^3d^4)g^{2i}x \log(dx+c) - ((B^2b^4c^2d^2 + 4B^2ab^3cd^3 - 5B^2a^2b^2d^4)g^{2i}x^2 - 12(2A^2ab^3cd^3 + A^2a^2b^2d^4)g^{2i}x - 12(2A^2ab^3cd^3 + A^2a^2b^2d^4)g^{2i}x^2 + 2(12A^2a^2b^2cd^3g^{2i} + (B^2b^4c^3d - 4B^2ab^3c^2d^2 + 2B^2a^2b^2cd^3 + B^2a^3b^2d^4)g^{2i}n)*x + 2(3B^2b^4d^4g^{2i}x^4 + 12B^2a^2b^2cd^3g^{2i}x + 4(B^2b^4cd^3 + 2B^2ab^3d^4)g^{2i}x^3 + 6(2B^2ab^3cd^3 + B^2a^2b^2d^4)g^{2i}x^2) \log(e) + 2(3B^2b^4d^4g^{2i}x^4 + 12B^2a^2b^2cd^3g^{2i}x^2 + 4(B^2b^4cd^3 + 2B^2ab^3d^4)g^{2i}x^3 + 6(2B^2ab^3cd^3 + B^2a^2b^2d^4)g^{2i}x^2) \log((bx+a)/(dx+c)))/b^2d^3)$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

---

**Giac [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac")
```

```
[Out] Timed out
```

$$3.110 \quad \int (ag + bgx)(ci + dix) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx$$

**Optimal.** Leaf size=149

$$\frac{gi(a+bx)^2(bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A - Bn \right)}{6b^2} + \frac{gi(a+bx)^2(c+dx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{3b} + \frac{Bgin(bc-ad)^3 \log(c+dx)}{6b^2d^2}$$

[Out]  $-(B*(b*c - a*d)^2*g*i*n*x)/(6*b*d) + (g*i*(a + b*x)^2*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b) + ((b*c - a*d)*g*i*(a + b*x)^2*(A - B*n + B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*b^2) + (B*(b*c - a*d)^3*g*i*n*Log[c + d*x])/(6*b^2*d^2)$

**Rubi [B]** time = 0.370136, antiderivative size = 311, normalized size of antiderivative = 2.09, number of steps used = 13, number of rules used = 6, integrand size = 39,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$ , Rules used = {2528, 2486, 31, 2525, 12, 72}

$$-\frac{1}{3}bBdginx \left( \frac{a^2}{b^2} - \frac{c^2}{d^2} \right) - \frac{a^2Bgin(ad+bc) \log(a+bx)}{2b^2} + \frac{a^3Bdgin \log(a+bx)}{3b^2} + \frac{1}{3}bdgix^3 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right) + \frac{1}{2}g$$

Antiderivative was successfully verified.

[In]  $\text{Int}[(a*g + b*g*x)*(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]$

[Out]  $a*A*c*g*i*x - (b*B*(a^2/b^2 - c^2/d^2)*d*g*i*n*x)/3 - (B*(b*c - a*d)*(b*c + a*d)*g*i*n*x)/(2*b*d) - (B*(b*c - a*d)*g*i*n*x^2)/6 + (a^3*B*d*g*i*n*Log[a + b*x])/(3*b^2) - (a^2*B*(b*c + a*d)*g*i*n*Log[a + b*x])/(2*b^2) + (a*B*c*g*i*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/b + ((b*c + a*d)*g*i*x^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/2 + (b*d*g*i*x^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/3 - (b*B*c^3*g*i*n*Log[c + d*x])/(3*d^2) - (a*B*c*(b*c - a*d)*g*i*n*Log[c + d*x])/(b*d) + (B*c^2*(b*c + a*d)*g*i*n*Log[c + d*x])/(2*d^2)$

**Rule 2528**

$\text{Int}[(a_. + \text{Log}[c_.*(\text{RFx}_.)^{p_.}])*(b_.)^{n_.}*(\text{RGx}_.), x\_Symbol] \rightarrow \text{With}[\{u = \text{ExpandIntegrand}[(a + b*\text{Log}[c*\text{RFx}^p])^n, \text{RGx}, x]\}, \text{Int}[u, x] /; \text{SumQ}[u]] /; \text{FreeQ}[\{a, b, c, p\}, x] \&\& \text{RationalFunctionQ}[\text{RFx}, x] \&\& \text{RationalFunctionQ}[\text{RGx}, x] \&\& \text{IGtQ}[n, 0]$

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q]^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^-1), x_Symbol] := Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
x_Symbol] := Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
/; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\begin{aligned}
\int (110c + 110dx)(ag + bgx) \left( A + B \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) \right) dx &= \int \left( 110acg \left( A + B \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) \right) + 110(bc + ad)gx \left( A + B \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) \right) \right) dx \\
&= (110acg) \int \left( A + B \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) \right) dx + (110bdg) \int x^2 \left( A + B \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) \right) dx \\
&= 110aAcgx + 55(bc + ad)gx^2 \left( A + B \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) \right) + \frac{110aBcg}{3} \int \frac{dx}{c + dx} \\
&= 110aAcgx + \frac{110aBcg(a + bx) \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right)}{b} + 55(bc + ad)gx^2 \\
&= 110aAcgx + \frac{110aBcg(a + bx) \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right)}{b} + 55(bc + ad)gx^2 \\
&= 110aAcgx - \frac{55B(bc - ad)(bc + ad)gnx}{3bd} - \frac{55}{3}B(bc - ad)gnx^2
\end{aligned}$$

**Mathematica [A]** time = 0.268147, size = 189, normalized size = 1.27

$$\frac{gi \left( b \left( dx \left( a^2 B d^2 n + abd(6Ac + 3Adx + Bdnx) + Ab^2 dx(3c + 2dx) + b^2(-B)cn(c + dx) \right) + Bcn \left( 6a^2 d^2 - 3abcd + b^2 c^2 \right) \log \left( \frac{a + bx}{c + dx} \right) \right)}{6b^2 d^2}$$

Antiderivative was successfully verified.

[In] Integrate[(a\*g + b\*g\*x)\*(c\*i + d\*i\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]),x]

[Out] (g\*i\*(-(a^2\*B\*d^2\*(3\*b\*c + a\*d)\*n\*Log[a + b\*x]) + b\*(d\*x\*(a^2\*B\*d^2\*n - b^2\*B\*c\*n\*(c + d\*x) + A\*b^2\*d\*x\*(3\*c + 2\*d\*x) + a\*b\*d\*(6\*A\*c + 3\*A\*d\*x + B\*d\*n\*x)) + B\*d^2\*(6\*a^2\*c + 3\*a\*b\*x\*(2\*c + d\*x) + b^2\*x^2\*(3\*c + 2\*d\*x))\*Log[e\*((a + b\*x)/(c + d\*x))^n] + B\*c\*(b^2\*c^2 - 3\*a\*b\*c\*d + 6\*a^2\*d^2)\*n\*Log[c + d\*x]))/(6\*b^2\*d^2)

**Maple [F]** time = 0.35, size = 0, normalized size = 0.

$$\int (bgx + ag)(dix + ci) \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((b*g*x+a*g)*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)`

[Out] `int((b*g*x+a*g)*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)`

**Maxima [B]** time = 1.68457, size = 531, normalized size = 3.56

$$\frac{1}{3} Bbdgix^3 \log\left(e\left(\frac{bx}{dx+c} + \frac{a}{dx+c}\right)^n\right) + \frac{1}{3} Abdgix^3 + \frac{1}{2} Bbcgix^2 \log\left(e\left(\frac{bx}{dx+c} + \frac{a}{dx+c}\right)^n\right) + \frac{1}{2} Badgix^2 \log\left(e\left(\frac{bx}{dx+c} + \frac{a}{dx+c}\right)^n\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*g*x+a*g)*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxima")`

[Out]  $\frac{1}{3} B b d g i x^3 \log\left(e\left(\frac{b x}{d x+c} + \frac{a}{d x+c}\right)^n\right) + \frac{1}{3} A b d g i x^3 + \frac{1}{2} B b c g i x^2 \log\left(e\left(\frac{b x}{d x+c} + \frac{a}{d x+c}\right)^n\right) + \frac{1}{2} B a d g i x^2 \log\left(e\left(\frac{b x}{d x+c} + \frac{a}{d x+c}\right)^n\right) + \frac{1}{2} A b c g i x^2 + \frac{1}{2} A a d g i x^2 + \frac{1}{6} B b d g i x n \left( \frac{2 a^3 \log(b x+a)}{b^3} - \frac{2 c^3 \log(d x+c)}{d^3} - \frac{((b^2 c d - a b d^2) x^2 - 2 (b^2 c^2 - a^2 d^2) x)}{(b^2 d^2)} - \frac{1}{2} B b c g i x n \left( \frac{a^2 \log(b x+a)}{b^2} - \frac{c^2 \log(d x+c)}{d^2} + \frac{(b c - a d) x}{(b d)} \right) - \frac{1}{2} B a d g i x n \left( \frac{a^2 \log(b x+a)}{b^2} - \frac{c^2 \log(d x+c)}{d^2} + \frac{(b c - a d) x}{(b d)} \right) + B a c g i x n \left( \frac{a \log(b x+a)}{b} - \frac{c \log(d x+c)}{d} \right) + B a c g i x^2 \log\left(e\left(\frac{b x}{d x+c} + \frac{a}{d x+c}\right)^n\right) + A a c g i x^2$

**Fricas [B]** time = 0.589842, size = 666, normalized size = 4.47

$$2 A b^3 d^3 g i x^3 + (3 B a^2 b c d^2 - B a^3 d^3) g i n \log(b x+a) + (B b^3 c^3 - 3 B a b^2 c^2 d) g i n \log(d x+c) - ((B b^3 c d^2 - B a b^2 d^3) g i n - 3$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*g*x+a*g)*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fricas")`

[Out]  $\frac{1}{6} (2 A b^3 d^3 g i x^3 + (3 B a^2 b c d^2 - B a^3 d^3) g i n \log(b x+a) + (B b^3 c^3 - 3 B a b^2 c^2 d) g i n \log(d x+c) - ((B b^3 c d^2 - B a b^2 d^3) g i n - 3$

$$\begin{aligned} &^2*d^3)*g*i*n - 3*(A*b^3*c*d^2 + A*a*b^2*d^3)*g*i)*x^2 + (6*A*a*b^2*c*d^2*g \\ &*i - (B*b^3*c^2*d - B*a^2*b*d^3)*g*i*n)*x + (2*B*b^3*d^3*g*i*x^3 + 6*B*a*b^ \\ &2*c*d^2*g*i*x + 3*(B*b^3*c*d^2 + B*a*b^2*d^3)*g*i*x^2)*\log(e) + (2*B*b^3*d^ \\ &3*g*i*n*x^3 + 6*B*a*b^2*c*d^2*g*i*n*x + 3*(B*b^3*c*d^2 + B*a*b^2*d^3)*g*i*n \\ &*x^2)*\log((b*x + a)/(d*x + c))/(b^2*d^2) \end{aligned}$$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n)),x)

[Out] Timed out

**Giac [A]** time = 10.146, size = 329, normalized size = 2.21

$$\frac{1}{3}(Abdgi + Bbdgi)x^3 - \frac{1}{6}(Bbcgin - Badgin - 3Abcgi - 3Bbcgi - 3Aadgi - 3Badgi)x^2 + \frac{1}{6}(2Bbdginx^3 + 6Bacginx +$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n)),x, algorith="giac")

[Out]  $\frac{1}{3}(A*b*d*g*i + B*b*d*g*i)*x^3 - \frac{1}{6}(B*b*c*g*i*n - B*a*d*g*i*n - 3*A*b*c* \\ g*i - 3*B*b*c*g*i - 3*A*a*d*g*i - 3*B*a*d*g*i)*x^2 + \frac{1}{6}(2*B*b*d*g*i*n*x^3 \\ + 6*B*a*c*g*i*n*x + 3*(B*b*c*g*i*n + B*a*d*g*i*n)*x^2)*\log((b*x + a)/(d*x \\ + c)) - \frac{1}{6}(B*b^2*c^2*g*i*n - B*a^2*d^2*g*i*n - 6*A*a*b*c*d*g*i - 6*B*a*b* \\ c*d*g*i)*x/(b*d) + \frac{1}{6}(B*b*c^3*g*i*n - 3*B*a*c^2*d*g*i*n)*\log(d*i*x + c*i) \\ /d^2 + \frac{1}{6}(3*B*a^2*b*c*g*i*n - B*a^3*d*g*i*n)*\log(b*x + a)/b^2$



$$3.111 \quad \int (ci + dix) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx$$

**Optimal.** Leaf size=86

$$\frac{i(c+dx)^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{2d} - \frac{Bin(bc-ad)^2 \log(a+bx)}{2b^2d} - \frac{Binx(bc-ad)}{2b}$$

[Out]  $-(B*(b*c - a*d)*i*n*x)/(2*b) - (B*(b*c - a*d)^2*i*n*Log[a + b*x])/(2*b^2*d) + (i*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d)$

**Rubi [A]** time = 0.0608629, antiderivative size = 86, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 31,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$ , Rules used = {2525, 12, 43}

$$\frac{i(c+dx)^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{2d} - \frac{Bin(bc-ad)^2 \log(a+bx)}{2b^2d} - \frac{Binx(bc-ad)}{2b}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]$

[Out]  $-(B*(b*c - a*d)*i*n*x)/(2*b) - (B*(b*c - a*d)^2*i*n*Log[a + b*x])/(2*b^2*d) + (i*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d)$

### Rule 2525

$\text{Int}[(a_.) + \text{Log}[(c_.)*(RFx_)^(p_.)]*(b_.)^(n_.)*((d_.) + (e_.)*(x_.))^(m_.), x\_Symbol] \rightarrow \text{Simp}[(d + e*x)^(m + 1)*(a + b*\text{Log}[c*RFx^p])^n/(e*(m + 1)), x] - \text{Dist}[(b*n*p)/(e*(m + 1)), \text{Int}[\text{SimplifyIntegrand}[(d + e*x)^(m + 1)*(a + b*\text{Log}[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;$  FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

### Rule 12

$\text{Int}[(a_)*(u_), x\_Symbol] \rightarrow \text{Dist}[a, \text{Int}[u, x], x] /;$  FreeQ[a, x] && !MatchQ[u, (b\_)\*(v\_) /; FreeQ[b, x]]

### Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

### Rubi steps

$$\begin{aligned}
\int (111c + 111dx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx &= \frac{111(c+dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{2d} - \frac{(Bn) \int \frac{12321(bc-ad)(c+dx)}{a+bx} dx}{222d} \\
&= \frac{111(c+dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{2d} - \frac{(111B(bc-ad)n) \int \frac{c+dx}{a+bx} dx}{2d} \\
&= \frac{111(c+dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{2d} - \frac{(111B(bc-ad)n) \int \left( \frac{d}{b} + \frac{bc-ad}{b(a+bx)} \right) dx}{2d} \\
&= -\frac{111B(bc-ad)nx}{2b} - \frac{111B(bc-ad)^2n \log(a+bx)}{2b^2d} + \frac{111(c+dx)^2 \left( A + \right)}{2}
\end{aligned}$$

**Mathematica [A]** time = 0.0388606, size = 74, normalized size = 0.86

$$\frac{i \left( (c+dx)^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right) - \frac{Bn(bc-ad)((bc-ad) \log(a+bx)+bdx)}{b^2} \right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]), x]
```

```
[Out] (i*(-((B*(b*c - a*d)*n*(b*d*x + (b*c - a*d)*Log[a + b*x]))/b^2) + (c + d*x)
^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d)
```

**Maple [F]** time = 0.371, size = 0, normalized size = 0.

$$\int (dix + ci) \left( A + B \ln \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)`

[Out] `int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)`

**Maxima [A]** time = 1.24362, size = 211, normalized size = 2.45

$$\frac{1}{2} B d i x^2 \log \left( e \left( \frac{b x}{d x + c} + \frac{a}{d x + c} \right)^n \right) + \frac{1}{2} A d i x^2 - \frac{1}{2} B d i n \left( \frac{a^2 \log (b x + a)}{b^2} - \frac{c^2 \log (d x + c)}{d^2} + \frac{(b c - a d) x}{b d} \right) + B c i n \left( \frac{a \log (b x + a)}{b} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxima")`

[Out] `1/2*B*d*i*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/2*A*d*i*x^2 - 1/2*B*d*i*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + B*c*i*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + B*c*i*x*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*c*i*x`

**Fricas [B]** time = 0.5185, size = 360, normalized size = 4.19

$$\frac{A b^2 d^2 i x^2 - B b^2 c^2 i n \log (d x + c) + (2 B a b c d - B a^2 d^2) i n \log (b x + a) + (2 A b^2 c d i - (B b^2 c d - B a b d^2) i n) x + (B b^2 d^2 i x^2 + \dots)}{2 b^2 d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fricas")`

[Out] `1/2*(A*b^2*d^2*i*x^2 - B*b^2*c^2*i*n*log(d*x + c) + (2*B*a*b*c*d - B*a^2*d^2)*i*n*log(b*x + a) + (2*A*b^2*c*d*i - (B*b^2*c*d - B*a*b*d^2)*i*n)*x + (B*b^2*d^2*i*x^2 + 2*B*b^2*c*d*i*x)*log(e) + (B*b^2*d^2*i*n*x^2 + 2*B*b^2*c*d*i*n*x)*log((b*x + a)/(d*x + c)))/(b^2*d)`

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n)),x)

[Out] Timed out

**Giac [B]** time = 1.47673, size = 339, normalized size = 3.94

$$\frac{1}{2}(Adi + Bdi)x^2 + \frac{1}{2}(Bdinx^2 + 2Bcinx) \log\left(\frac{bx + a}{dx + c}\right) - \frac{(Bbcin - Badin - 2Abci - 2Bbci)x}{2b} - \frac{(Bb^2c^2in - 2Babcdn + Bb^2c^2in - 2Babcdn + Bb^2c^2in)}{2b}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n)),x, algorithm="giac")

[Out] 1/2\*(A\*d\*i + B\*d\*i)\*x^2 + 1/2\*(B\*d\*i\*n\*x^2 + 2\*B\*c\*i\*n\*x)\*log((b\*x + a)/(d\*x + c)) - 1/2\*(B\*b\*c\*i\*n - B\*a\*d\*i\*n - 2\*A\*b\*c\*i - 2\*B\*b\*c\*i)\*x/b - 1/4\*(B\*b^2\*c^2\*i\*n - 2\*B\*a\*b\*c\*d\*i\*n + B\*a^2\*d^2\*i\*n)\*log(abs(b\*d\*x^2 + b\*c\*x + a\*d\*x + a\*c))/(b^2\*d) + 1/4\*(B\*b^3\*c^3\*i\*n + B\*a\*b^2\*c^2\*d\*i\*n - 3\*B\*a^2\*b\*c\*d^2\*i\*n + B\*a^3\*d^3\*i\*n)\*log(abs((2\*b\*d\*x + b\*c + a\*d - abs(-b\*c + a\*d))/(2\*b\*d\*x + b\*c + a\*d + abs(-b\*c + a\*d))))/(b^2\*d\*abs(-b\*c + a\*d))

$$3.112 \quad \int \frac{(ci+dx) \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{ag+bgx} dx$$

**Optimal.** Leaf size=141

$$\frac{Bin(bc-ad)PolyLog\left(2, \frac{bc-ad}{d(a+bx)} + 1\right)}{b^2g} - \frac{i(bc-ad) \log\left(-\frac{bc-ad}{d(a+bx)}\right) \left( B \log\left(e \left(\frac{a+bx}{c+dx}\right)^n\right) + A - Bn \right)}{b^2g} + \frac{i(c+dx) \left( B \log\left(e \left(\frac{a+bx}{c+dx}\right)^n\right) + A - Bn \right)}{bg}$$

[Out] (i\*(c + d\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(b\*g) - ((b\*c - a\*d)\*i\*Log[-((b\*c - a\*d)/(d\*(a + b\*x))])\*(A - B\*n + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(b^2\*g) + (B\*(b\*c - a\*d)\*i\*n\*PolyLog[2, 1 + (b\*c - a\*d)/(d\*(a + b\*x))])/(b^2\*g)

**Rubi [A]** time = 0.344796, antiderivative size = 223, normalized size of antiderivative = 1.58, number of steps used = 13, number of rules used = 10, integrand size = 41,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.244$ , Rules used = {2528, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{Bin(bc-ad)PolyLog\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{b^2g} + \frac{i(bc-ad) \log(a+bx) \left( B \log\left(e \left(\frac{a+bx}{c+dx}\right)^n\right) + A \right)}{b^2g} + \frac{Bdi(a+bx) \log\left(e \left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2g} - \frac{Bdi(a+bx)}{bg}$$

Antiderivative was successfully verified.

[In] Int[((c\*i + d\*i\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(a\*g + b\*g\*x), x]

[Out] (A\*d\*i\*x)/(b\*g) - (B\*(b\*c - a\*d)\*i\*n\*Log[a + b\*x]^2)/(2\*b^2\*g) + (B\*d\*i\*(a + b\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n])/(b^2\*g) + ((b\*c - a\*d)\*i\*Log[a + b\*x]\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(b^2\*g) - (B\*(b\*c - a\*d)\*i\*n\*Log[c + d\*x])/(b^2\*g) + (B\*(b\*c - a\*d)\*i\*n\*Log[a + b\*x]\*Log[(b\*(c + d\*x))/(b\*c - a\*d)])/(b^2\*g) + (B\*(b\*c - a\*d)\*i\*n\*PolyLog[2, -((d\*(a + b\*x))/(b\*c - a\*d))])/(b^2\*g)

### Rule 2528

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^n]\*(RGx\_), x\_Symbol] :> With[{u = ExpandIntegrand[(a + b\*Log[c\*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q]^r]^s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(n_), x_Symbol] := Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFX^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFX_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFX, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFX, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
```

, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))])\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :> Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] :> -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rubi steps

$$\begin{aligned}
\int \frac{(112c + 112dx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{ag + bgx} dx &= \int \left( \frac{112d \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{bg} + \frac{112(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{bg(a + bx)} \right) dx \\
&= \frac{(112d) \int \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx}{bg} + \frac{(112(bc - ad)) \int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{a+bx}}{bg} \\
&= \frac{112Adx}{bg} + \frac{112(bc - ad) \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g} + \frac{(112Bd) \int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{a+bx}}{b^2g} \\
&= \frac{112Adx}{bg} + \frac{112Bd(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^2g} + \frac{112(bc - ad) \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g} \\
&= \frac{112Adx}{bg} + \frac{112Bd(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^2g} + \frac{112(bc - ad) \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g} \\
&= \frac{112Adx}{bg} + \frac{112Bd(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^2g} + \frac{112(bc - ad) \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g} \\
&= \frac{112Adx}{bg} - \frac{56B(bc - ad)n \log^2(a + bx)}{b^2g} + \frac{112Bd(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^2g} \\
&= \frac{112Adx}{bg} - \frac{56B(bc - ad)n \log^2(a + bx)}{b^2g} + \frac{112Bd(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^2g}
\end{aligned}$$

**Mathematica [A]** time = 0.123463, size = 172, normalized size = 1.22

$$\frac{i \left( 2Bn(bc - ad) \text{PolyLog} \left( 2, \frac{d(a+bx)}{ad-bc} \right) + 2(bc - ad) \log(a + bx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + Bn \log \left( \frac{b(c+dx)}{bc-ad} \right) + A \right) + 2 \left( Bd(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{2b^2g}$$

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(a\*g + b\*g\*x), x]

[Out] (i\*(B\*(-(b\*c) + a\*d)\*n\*Log[a + b\*x]^2 + 2\*(A\*b\*d\*x + B\*d\*(a + b\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n] + B\*(-(b\*c) + a\*d)\*n\*Log[c + d\*x]) + 2\*(b\*c - a\*d)\*L



og[a + b\*x]\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n] + B\*n\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]) + 2\*B\*(b\*c - a\*d)\*n\*PolyLog[2, (d\*(a + b\*x))/(-b\*c + a\*d)])/(2\*b^2\*g)

**Maple [F]** time = 0.619, size = 0, normalized size = 0.

$$\int \frac{dix + ci}{bgx + ag} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g),x)

[Out] int((d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g),x)

**Maxima [A]** time = 2.89133, size = 373, normalized size = 2.65

$$A di \left( \frac{x}{bg} - \frac{a \log(bx + a)}{b^2 g} \right) - \frac{Bcin \log(dx + c)}{bg} + \frac{Aci \log(bgx + ag)}{bg} + \frac{(bcin - adin) \left( \log(bx + a) \log \left( \frac{bdx + ad}{bc - ad} + 1 \right) \right) + Li_2}{b^2 g}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g),x, algorithm="maxima")

[Out] A\*d\*i\*(x/(b\*g) - a\*log(b\*x + a)/(b^2\*g)) - B\*c\*i\*n\*log(d\*x + c)/(b\*g) + A\*c\*i\*log(b\*g\*x + a\*g)/(b\*g) + (b\*c\*i\*n - a\*d\*i\*n)\*(log(b\*x + a)\*log((b\*d\*x + a\*d)/(b\*c - a\*d) + 1) + dilog(-(b\*d\*x + a\*d)/(b\*c - a\*d)))\*B/(b^2\*g) + 1/2\*(2\*B\*b\*d\*i\*x\*log(e) - (b\*c\*i\*n - a\*d\*i\*n)\*B\*log(b\*x + a)^2 + 2\*(b\*c\*i\*log(e) + (i\*n - i\*log(e))\*a\*d)\*B\*log(b\*x + a) + 2\*(B\*b\*d\*i\*x + (b\*c\*i - a\*d\*i)\*B\*log(b\*x + a))\*log((b\*x + a)^n) - 2\*(B\*b\*d\*i\*x + (b\*c\*i - a\*d\*i)\*B\*log(b\*x + a))\*log((d\*x + c)^n))/(b^2\*g)

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{Adix + Aci + (Bdix + Bci) \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right)}{bgx + ag}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x, algo
ithm="fricas")
```

```
[Out] integral((A*d*i*x + A*c*i + (B*d*i*x + B*c*i)*log(e*((b*x + a)/(d*x + c))^n
))/(b*g*x + a*g), x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci) \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)}{bgx + ag} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x, algo
ithm="giac")
```

```
[Out] integrate((d*i*x + c*i)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)/(b*g*x + a*g
), x)
```

$$3.113 \quad \int \frac{(ci+dx) \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ag+bgx)^2} dx$$

**Optimal.** Leaf size=150

$$\frac{B \operatorname{dinPolyLog} \left( 2, \frac{b(c+dx)}{d(a+bx)} \right)}{b^2 g^2} - \frac{di \log \left( 1 - \frac{b(c+dx)}{d(a+bx)} \right) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{b^2 g^2} - \frac{i(c+dx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{bg^2(a+bx)} - \frac{Bin(c+dx)}{bg^2(a+bx)}$$

[Out]  $-\left(\frac{B \cdot i^n \cdot (c + d \cdot x)}{b \cdot g^2 \cdot (a + b \cdot x)}\right) - \left(\frac{i \cdot (c + d \cdot x) \cdot (A + B \cdot \operatorname{Log}[e \cdot \left(\frac{a + b \cdot x}{c + d \cdot x}\right)^n])}{b \cdot g^2 \cdot (a + b \cdot x)} - \frac{d \cdot i \cdot (A + B \cdot \operatorname{Log}[e \cdot \left(\frac{a + b \cdot x}{c + d \cdot x}\right)^n]) \cdot \operatorname{Log}\left[1 - \frac{b \cdot (c + d \cdot x)}{d \cdot (a + b \cdot x)}\right]}{b^2 \cdot g^2} + \frac{B \cdot d \cdot i^n \cdot \operatorname{PolyLog}\left[2, \frac{b \cdot (c + d \cdot x)}{d \cdot (a + b \cdot x)}\right]}{b^2 \cdot g^2}\right)$

**Rubi [A]** time = 0.375878, antiderivative size = 233, normalized size of antiderivative = 1.55, number of steps used = 14, number of rules used = 11, integrand size = 41,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.268$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B \operatorname{dinPolyLog} \left( 2, -\frac{d(a+bx)}{bc-ad} \right)}{b^2 g^2} + \frac{di \log(a+bx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{b^2 g^2} - \frac{i(bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{b^2 g^2(a+bx)} - \frac{Bin(bc-ad)}{b^2 g^2(a+bx)}$$

Antiderivative was successfully verified.

[In]  $\operatorname{Int}\left[\frac{(c \cdot i + d \cdot i \cdot x) \cdot (A + B \cdot \operatorname{Log}[e \cdot \left(\frac{a + b \cdot x}{c + d \cdot x}\right)^n])}{(a \cdot g + b \cdot g \cdot x)^2}, x\right]$

[Out]  $-\left(\frac{B \cdot (b \cdot c - a \cdot d) \cdot i^n}{b^2 \cdot g^2 \cdot (a + b \cdot x)}\right) - \frac{B \cdot d \cdot i^n \cdot \operatorname{Log}[a + b \cdot x]}{b^2 \cdot g^2} - \frac{B \cdot d \cdot i^n \cdot \operatorname{Log}[a + b \cdot x]^2}{2 \cdot b^2 \cdot g^2} - \left(\frac{(b \cdot c - a \cdot d) \cdot i \cdot (A + B \cdot \operatorname{Log}[e \cdot \left(\frac{a + b \cdot x}{c + d \cdot x}\right)^n])}{b^2 \cdot g^2 \cdot (a + b \cdot x)} + \frac{d \cdot i \cdot \operatorname{Log}[a + b \cdot x] \cdot (A + B \cdot \operatorname{Log}[e \cdot \left(\frac{a + b \cdot x}{c + d \cdot x}\right)^n])}{b^2 \cdot g^2} + \frac{B \cdot d \cdot i^n \cdot \operatorname{Log}[c + d \cdot x]}{b^2 \cdot g^2} + \frac{B \cdot d \cdot i^n \cdot \operatorname{Log}[a + b \cdot x] \cdot \operatorname{Log}\left[\frac{b \cdot (c + d \cdot x)}{b \cdot c - a \cdot d}\right]}{b^2 \cdot g^2} + \frac{B \cdot d \cdot i^n \cdot \operatorname{PolyLog}\left[2, -\frac{d \cdot (a + b \cdot x)}{b \cdot c - a \cdot d}\right]}{b^2 \cdot g^2}\right)$

### Rule 2528

$\operatorname{Int}\left[\frac{(a \cdot \_) + \operatorname{Log}[c \cdot \_ \cdot (\operatorname{RFx}_\_)^{(p \cdot \_)}] \cdot (b \cdot \_)^{(n \cdot \_)} \cdot (\operatorname{RGx}_\_) , x\_ \operatorname{Symbol}}{\_} \right] \rightarrow \operatorname{With}\left[\{u = \operatorname{ExpandIntegrand}[(a + b \cdot \operatorname{Log}[c \cdot \operatorname{RFx}^p])^n, \operatorname{RGx}, x], \operatorname{Int}[u, x] /; \operatorname{SumQ}[u]\right] /; \operatorname{FreeQ}\{a, b, c, p\}, x\} \&\& \operatorname{RationalFunctionQ}[\operatorname{RFx}, x] \&\& \operatorname{RationalFunctionQ}[\operatorname{RGx}, x] \&\& \operatorname{IGtQ}[n, 0]$

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFX^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFX_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFX, x]}, Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFX, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
```

$g[c*x^n]^2/(2*b*n), x] /; \text{FreeQ}\{a, b, c, n\}, x]$

#### Rule 2394

$\text{Int}[(a + \text{Log}[c*(d + (e*x)^n)]*(b))/((f) + (g)*(x)), x\_Symbol] :> \text{Simp}[(\text{Log}[(e*(f + g*x))/(e*f - d*g)]*(a + b*\text{Log}[c*(d + e*x)^n]))/g, x] - \text{Dist}[(b*e^n)/g, \text{Int}[\text{Log}[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, n\}, x] \&\& \text{NeQ}[e*f - d*g, 0]$

#### Rule 2393

$\text{Int}[(a + \text{Log}[c*(d + (e*x))]*(b))/((f) + (g)*(x)), x\_Symbol] :> \text{Dist}[1/g, \text{Subst}[\text{Int}[(a + b*\text{Log}[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g\}, x] \&\& \text{NeQ}[e*f - d*g, 0] \&\& \text{EqQ}[g + c*(e*f - d*g), 0]$

#### Rule 2391

$\text{Int}[\text{Log}[c*(d + (e*x)^n)]/(x), x\_Symbol] :> -\text{Simp}[\text{PolyLog}[2, -(c*e*x^n)]/n, x] /; \text{FreeQ}\{c, d, e, n\}, x] \&\& \text{EqQ}[c*d, 1]$

#### Rubi steps

$$\begin{aligned}
\int \frac{(113c + 113dx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ag + bgx)^2} dx &= \int \left( \frac{113(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{bg^2(a + bx)^2} + \frac{113d \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{bg^2(a + bx)} \right) dx \\
&= \frac{(113d) \int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{a+bx} dx}{bg^2} + \frac{(113(bc - ad)) \int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{(a+bx)^2} dx}{bg^2} \\
&= -\frac{113(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g^2(a + bx)} + \frac{113d \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g^2} \\
&= -\frac{113(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g^2(a + bx)} + \frac{113d \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g^2} \\
&= -\frac{113(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g^2(a + bx)} + \frac{113d \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g^2} \\
&= -\frac{113B(bc - ad)n}{b^2g^2(a + bx)} - \frac{113Bdn \log(a + bx)}{b^2g^2} - \frac{113(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g^2(a + bx)} \\
&= -\frac{113B(bc - ad)n}{b^2g^2(a + bx)} - \frac{113Bdn \log(a + bx)}{b^2g^2} - \frac{113Bdn \log^2(a + bx)}{2b^2g^2} - \frac{113(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g^2(a + bx)} \\
&= -\frac{113B(bc - ad)n}{b^2g^2(a + bx)} - \frac{113Bdn \log(a + bx)}{b^2g^2} - \frac{113Bdn \log^2(a + bx)}{2b^2g^2} - \frac{113(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g^2(a + bx)}
\end{aligned}$$

**Mathematica [A]** time = 0.173961, size = 189, normalized size = 1.26

$$i \left( \frac{Bdn \left( -2 \text{PolyLog} \left( 2, -\frac{d(a+bx)}{bc-ad} \right) - 2 \log(a+bx) \log \left( \frac{b(c+dx)}{bc-ad} \right) + \log^2(a+bx) \right)}{2b^2} + \frac{d \log(a+bx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{b^2} - \frac{(bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{b^2(a+bx)} - \frac{Bn \left( \frac{bc-ad}{a+bx} \right)}{b^2} \right)$$

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(a\*g + b\*g\*x)^2,x]

```
[Out] (i*(-(((b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^2*(a + b*x)))
+ (d*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/b^2 - (B*n*((b*c
- a*d)/(a + b*x) + d*Log[a + b*x] - d*Log[c + d*x]))/b^2 - (B*d*n*(Log[a +
b*x]^2 - 2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] - 2*PolyLog[2, -(d
*(a + b*x))/(b*c - a*d)])))/(2*b^2))/g^2
```

**Maple [F]** time = 0.523, size = 0, normalized size = 0.

$$\int \frac{dix + ci}{(bgx + ag)^2} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x)
```

```
[Out] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x)
```

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$-Bcin \left( \frac{1}{b^2g^2x + abg^2} + \frac{d \log(bx + a)}{(b^2c - abd)g^2} - \frac{d \log(dx + c)}{(b^2c - abd)g^2} \right) + Bdi \left( \frac{((bx + a) \log(bx + a) + a) \log((bx + a)^n) - ((bx + a) \log(bx + a) + a) \log((dx + c)^n)}{b^3g^2x + ab^2g^2} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x, alg
orithm="maxima")
```

```
[Out] -B*c*i*n*(1/(b^2*g^2*x + a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)*g^2) -
d*log(d*x + c)/((b^2*c - a*b*d)*g^2)) + B*d*i*((((b*x + a)*log(b*x + a) + a
)*log((b*x + a)^n) - ((b*x + a)*log(b*x + a) + a)*log((d*x + c)^n))/(b^3*g^
2*x + a*b^2*g^2) + integrate((b^2*d*x^2*log(e) + b^2*c*x*log(e) - a*b*c*n +
a^2*d*n - (a*b*c*n - a^2*d*n + (b^2*c*n - a*b*d*n)*x)*log(b*x + a))/(b^4*d
*g^2*x^3 + a^2*b^2*c*g^2 + (b^4*c*g^2 + 2*a*b^3*d*g^2)*x^2 + (2*a*b^3*c*g^2
+ a^2*b^2*d*g^2)*x), x) + A*d*i*(a/(b^3*g^2*x + a*b^2*g^2) + log(b*x + a)
/(b^2*g^2)) - B*c*i*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^2*g^2*x + a*b
*g^2) - A*c*i/(b^2*g^2*x + a*b*g^2)
```

---

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{Adix + Aci + (Bdix + Bci) \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right)}{b^2g^2x^2 + 2abg^2x + a^2g^2}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^2,x, algorithm="fricas")

[Out] integral((A\*d\*i\*x + A\*c\*i + (B\*d\*i\*x + B\*c\*i)\*log(e\*((b\*x + a)/(d\*x + c))^n))/(b^2\*g^2\*x^2 + 2\*a\*b\*g^2\*x + a^2\*g^2), x)

---

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)\*\*2,x)

[Out] Timed out

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci) \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)}{(bgx + ag)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^2,x, algorithm="giac")

[Out] integrate((d\*i\*x + c\*i)\*(B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)/(b\*g\*x + a\*g)^2, x)



$$3.114 \quad \int \frac{(ci+dx) \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ag+bgx)^3} dx$$

**Optimal.** Leaf size=89

$$-\frac{i(c+dx)^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{2g^3(a+bx)^2(bc-ad)} - \frac{Bin(c+dx)^2}{4g^3(a+bx)^2(bc-ad)}$$

[Out]  $-(B*i*n*(c+d*x)^2)/(4*(b*c-a*d)*g^3*(a+b*x)^2) - (i*(c+d*x)^2*(A+B*\text{Log}[e*((a+b*x)/(c+d*x))^n]))/(2*(b*c-a*d)*g^3*(a+b*x)^2)$

**Rubi [B]** time = 0.285895, antiderivative size = 201, normalized size of antiderivative = 2.26, number of steps used = 10, number of rules used = 4, integrand size = 41,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.098$ , Rules used = {2528, 2525, 12, 44}

$$\frac{di \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{b^2g^3(a+bx)} - \frac{i(bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{2b^2g^3(a+bx)^2} - \frac{Bd^2in \log(a+bx)}{2b^2g^3(bc-ad)} + \frac{Bd^2in \log(c+dx)}{2b^2g^3(bc-ad)} - \frac{Bin(bc-ad)}{4b^2g^3(a+bx)^2}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[\frac{((c*i+d*i*x)*(A+B*\text{Log}[e*((a+b*x)/(c+d*x))^n]))}{(a*g+b*g*x)^3}, x]$

[Out]  $-(B*(b*c-a*d)*i*n)/(4*b^2*g^3*(a+b*x)^2) - (B*d*i*n)/(2*b^2*g^3*(a+b*x)) - (B*d^2*i*n*\text{Log}[a+b*x])/(2*b^2*(b*c-a*d)*g^3) - ((b*c-a*d)*i*(A+B*\text{Log}[e*((a+b*x)/(c+d*x))^n]))/(2*b^2*g^3*(a+b*x)^2) - (d*i*(A+B*\text{Log}[e*((a+b*x)/(c+d*x))^n]))/(b^2*g^3*(a+b*x)) + (B*d^2*i*n*\text{Log}[c+d*x])/(2*b^2*(b*c-a*d)*g^3)$

#### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

#### Rule 2525

```

Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]

```

### Rule 12

```

Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]

```

### Rule 44

```

Int[((a_) + (b_.)*(x_.))^(m_.)*((c_.) + (d_.)*(x_.))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])

```

### Rubi steps

$$\begin{aligned}
\int \frac{(114c + 114dx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ag + bgx)^3} dx &= \int \left( \frac{114(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{bg^3(a + bx)^3} + \frac{114d \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{bg^3(a + bx)^2} \right) dx \\
&= \frac{(114d) \int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{(a+bx)^2} dx}{bg^3} + \frac{(114(bc - ad)) \int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{(a+bx)^3} dx}{bg^3} \\
&= -\frac{57(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g^3(a + bx)^2} - \frac{114d \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g^3(a + bx)} + \\
&= -\frac{57(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g^3(a + bx)^2} - \frac{114d \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g^3(a + bx)} + \\
&= -\frac{57(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g^3(a + bx)^2} - \frac{114d \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g^3(a + bx)} + \\
&= -\frac{57B(bc - ad)n}{2b^2g^3(a + bx)^2} - \frac{57Bdn}{b^2g^3(a + bx)} - \frac{57Bd^2n \log(a + bx)}{b^2(bc - ad)g^3} - \frac{57(bc - ad) \left( A \right)}{b^2g^3}
\end{aligned}$$

**Mathematica [B]** time = 0.161494, size = 216, normalized size = 2.43

$$i \left( \frac{d \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{b^2(a+bx)} - \frac{(bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{2b^2(a+bx)^2} - \frac{Bn \left( -\frac{2d^2 \log(a+bx)}{bc-ad} + \frac{2d^2 \log(c+dx)}{bc-ad} + \frac{bc-ad}{(a+bx)^2} - \frac{2d}{a+bx} \right)}{4b^2} - \frac{Bdn \left( \frac{d \log(a+bx)}{bc-ad} - \frac{d \log(c+dx)}{bc-ad} + \frac{1}{a+bx} \right)}{b^2} \right) \frac{1}{g^3}$$

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(a\*g + b\*g\*x)^3,x]

[Out] (i\*(-((b\*c - a\*d)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(2\*b^2\*(a + b\*x)^2 - (d\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(b^2\*(a + b\*x)) - (B\*d\*n\*((a + b\*x)^(-1) + (d\*Log[a + b\*x]))/(b\*c - a\*d) - (d\*Log[c + d\*x]))/(b\*c - a\*d))/b^2 - (B\*n\*((b\*c - a\*d)/(a + b\*x)^2 - (2\*d)/(a + b\*x) - (2\*d^2\*Log[a + b\*x]))/(b\*c - a\*d) + (2\*d^2\*Log[c + d\*x]))/(b\*c - a\*d))/(4\*b^2))/g^3

**Maple [F]** time = 0.514, size = 0, normalized size = 0.

$$\int \frac{dix + ci}{(bgx + ag)^3} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^3,x)

[Out] int((d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^3,x)

**Maxima [B]** time = 1.29162, size = 786, normalized size = 8.83

$$-\frac{1}{4} Bdin \left( \frac{3abc - a^2d + 2(2b^2c - abd)x}{(b^5c - ab^4d)g^3x^2 + 2(ab^4c - a^2b^3d)g^3x + (a^2b^3c - a^3b^2d)g^3} + \frac{2(2bcd - ad^2) \log(bx + a)}{(b^4c^2 - 2ab^3cd + a^2b^2d^2)g^3} - \frac{2(2bcd - ad^2)}{(b^4c^2 - 2ab^3cd)} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^3,x, algorithm="maxima")

```
[Out] -1/4*B*d*i*n*((3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*d)*x)/((b^5*c - a*b^4*d)*
g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)*g^3) + 2*
(2*b*c*d - a*d^2)*log(b*x + a)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3)
- 2*(2*b*c*d - a*d^2)*log(d*x + c)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g
^3)) + 1/4*B*c*i*n*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*
(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + 2*d^2*log(b*x +
a)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2
- 2*a*b^2*c*d + a^2*b*d^2)*g^3)) - 1/2*(2*b*x + a)*B*d*i*log(e*(b*x/(d*x +
c) + a/(d*x + c))^n)/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) - 1/2*(2*
b*x + a)*A*d*i/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) - 1/2*B*c*i*log(
e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3
) - 1/2*A*c*i/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3)
```

**Fricas [B]** time = 0.509721, size = 510, normalized size = 5.73

$$\frac{(Bb^2c^2 - Ba^2d^2)in + 2(Ab^2c^2 - Aa^2d^2)i + 2((Bb^2cd - Babd^2)in + 2(Ab^2cd - Aabd^2)i)x + 2(2(Bb^2cd - Babd^2)ix + (Bb^2c^2 - Ba^2d^2)ix + 2(Ab^2c^2 - Aa^2d^2)i)}{4((b^5c - ab^4d)g^3x^2 + 2(ab^4c - a^2b^3d)g^3x + (a^2b^3c - ab^4d)g^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x, alg
orithm="fricas")
```

```
[Out] -1/4*((B*b^2*c^2 - B*a^2*d^2)*i*n + 2*(A*b^2*c^2 - A*a^2*d^2)*i + 2*((B*b^2
*c*d - B*a*b*d^2)*i*n + 2*(A*b^2*c*d - A*a*b*d^2)*i)*x + 2*(2*(B*b^2*c*d -
B*a*b*d^2)*i*x + (B*b^2*c^2 - B*a^2*d^2)*i)*log(e) + 2*(B*b^2*d^2*i*n*x^2 +
2*B*b^2*c*d*i*n*x + B*b^2*c^2*i*n)*log((b*x + a)/(d*x + c))/((b^5*c - a*b
^4*d)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)*g^3
)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)**3,x)
```

[Out] Timed out

**Giac [B]** time = 1.23785, size = 320, normalized size = 3.6

$$\frac{Bd^2n \log(bx + a)}{2(b^3cg^3i - ab^2dg^3i)} - \frac{Bd^2n \log(dx + c)}{2(b^3cg^3i - ab^2dg^3i)} - \frac{(2Bbdinx + Bbcin + Badin) \log\left(\frac{bx+a}{dx+c}\right)}{2(b^4g^3x^2 + 2ab^3g^3x + a^2b^2g^3)} - \frac{2Bbdinx + Bbcin + Badin + 4}{4(b^4g^3x^2 + 2ab^3g^3x + a^2b^2g^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^3,x, algorithm="giac")

[Out]  $\frac{1}{2}Bd^2n \log(bx + a)/(b^3c * g^3i - a * b^2 * d * g^3i) - \frac{1}{2}Bd^2n \log(dx + c)/(b^3c * g^3i - a * b^2 * d * g^3i) - \frac{1}{2} * (2 * B * b * d * i * n * x + B * b * c * i * n + B * a * d * i * n) * \log((b * x + a) / (d * x + c)) / (b^4 * g^3 * x^2 + 2 * a * b^3 * g^3 * x + a^2 * b^2 * g^3) - \frac{1}{4} * (2 * B * b * d * i * n * x + B * b * c * i * n + B * a * d * i * n + 4 * A * b * d * i * x + 4 * B * b * d * i * x + 2 * A * b * c * i + 2 * B * b * c * i + 2 * A * a * d * i + 2 * B * a * d * i) / (b^4 * g^3 * x^2 + 2 * a * b^3 * g^3 * x + a^2 * b^2 * g^3)$

$$3.115 \quad \int \frac{(ci+dx) \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ag+bgx)^4} dx$$

**Optimal.** Leaf size=181

$$-\frac{bi(c+dx)^3 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{3g^4(a+bx)^3(bc-ad)^2} + \frac{di(c+dx)^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{2g^4(a+bx)^2(bc-ad)^2} - \frac{bBin(c+dx)^3}{9g^4(a+bx)^3(bc-ad)^2} + \frac{Bdin(c+dx)}{4g^4(a+bx)^2(bc-ad)}$$

[Out]  $(B*d*i*n*(c+d*x)^2)/(4*(b*c-a*d)^2*g^4*(a+b*x)^2) - (b*B*i*n*(c+d*x)^3)/(9*(b*c-a*d)^2*g^4*(a+b*x)^3) + (d*i*(c+d*x)^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(2*(b*c-a*d)^2*g^4*(a+b*x)^2) - (b*i*(c+d*x)^3*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(3*(b*c-a*d)^2*g^4*(a+b*x)^3)$

**Rubi [A]** time = 0.340598, antiderivative size = 236, normalized size of antiderivative = 1.3, number of steps used = 10, number of rules used = 4, integrand size = 41,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.098$ , Rules used = {2528, 2525, 12, 44}

$$-\frac{di \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{2b^2g^4(a+bx)^2} - \frac{i(bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{3b^2g^4(a+bx)^3} + \frac{Bd^2in}{6b^2g^4(a+bx)(bc-ad)} + \frac{Bd^3in \log(a+bx)}{6b^2g^4(bc-ad)^2} - \frac{Bd^3in}{6b^2g^4}$$

Antiderivative was successfully verified.

[In] Int[((c\*i + d\*i\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(a\*g + b\*g\*x)^4, x]

[Out]  $-(B*(b*c-a*d)*i*n)/(9*b^2*g^4*(a+b*x)^3) - (B*d*i*n)/(12*b^2*g^4*(a+b*x)^2) + (B*d^2*i*n)/(6*b^2*(b*c-a*d)*g^4*(a+b*x)) + (B*d^3*i*n*Log[a+b*x])/(6*b^2*(b*c-a*d)^2*g^4) - ((b*c-a*d)*i*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(3*b^2*g^4*(a+b*x)^3) - (d*i*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(2*b^2*g^4*(a+b*x)^2) - (B*d^3*i*n*Log[c+d*x])/(6*b^2*(b*c-a*d)^2*g^4)$

**Rule 2528**

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*(RGx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_.))^(m_.)*((c_.) + (d_.)*(x_.))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{(115c + 115dx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ag + bgx)^4} dx &= \int \left( \frac{115(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{bg^4(a + bx)^4} + \frac{115d \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{bg^4(a + bx)^3} \right) dx \\
&= \frac{(115d) \int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{(a+bx)^3} dx}{bg^4} + \frac{(115(bc - ad)) \int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{(a+bx)^4} dx}{bg^4} \\
&= -\frac{115(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3b^2g^4(a + bx)^3} - \frac{115d \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{2b^2g^4(a + bx)^2} + \\
&= -\frac{115(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3b^2g^4(a + bx)^3} - \frac{115d \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{2b^2g^4(a + bx)^2} + \\
&= -\frac{115(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3b^2g^4(a + bx)^3} - \frac{115d \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{2b^2g^4(a + bx)^2} + \\
&= -\frac{115B(bc - ad)n}{9b^2g^4(a + bx)^3} - \frac{115Bdn}{12b^2g^4(a + bx)^2} + \frac{115Bd^2n}{6b^2(bc - ad)g^4(a + bx)} + \frac{115Ba^3}{6b^2}
\end{aligned}$$

**Mathematica [A]** time = 0.460613, size = 196, normalized size = 1.08

$$\frac{i \left( \frac{12Abc}{(a+bx)^3} + \frac{18Ad}{(a+bx)^2} - \frac{12aAd}{(a+bx)^3} - \frac{6Bd^2n}{(a+bx)(bc-ad)} - \frac{6Bd^3n \log(a+bx)}{(bc-ad)^2} + \frac{6Bd^3n \log(c+dx)}{(bc-ad)^2} + \frac{6B(ad+2bc+3bdx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{(a+bx)^3} + \frac{4bBcn}{(a+bx)^3} + \frac{3Bdn}{(a+bx)^2} \right)}{36b^2g^4}$$

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(a\*g + b\*g\*x)^4,x]

[Out] -(i\*((12\*A\*b\*c)/(a + b\*x)^3 - (12\*a\*A\*d)/(a + b\*x)^3 + (4\*b\*B\*c\*n)/(a + b\*x)^3 - (4\*a\*B\*d\*n)/(a + b\*x)^3 + (18\*A\*d)/(a + b\*x)^2 + (3\*B\*d\*n)/(a + b\*x)^2 - (6\*B\*d^2\*n)/((b\*c - a\*d)\*(a + b\*x)) - (6\*B\*d^3\*n\*Log[a + b\*x])/(b\*c - a\*d)^2 + (6\*B\*(2\*b\*c + a\*d + 3\*b\*d\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n])/(a + b\*x)^3 + (6\*B\*d^3\*n\*Log[c + d\*x])/(b\*c - a\*d)^2))/(36\*b^2\*g^4)



**Maple [F]** time = 0.531, size = 0, normalized size = 0.

$$\int \frac{dix + ci}{(bgx + ag)^4} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^4,x)

[Out] int((d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^4,x)

**Maxima [B]** time = 1.49898, size = 1276, normalized size = 7.05

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^4,x, algorithm="maxima")

[Out] 
$$\begin{aligned} & -1/18*B*c*i*n*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4) \\ & + 6*d^3*\log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*\log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4) \\ & - 1/36*B*d*i*n*((5*a*b^2*c^2 - 22*a^2*b*c*d + 5*a^3*d^2 - 6*(3*b^3*c*d - a*b^2*d^2)*x^2 + 3*(3*b^3*c^2 - 16*a*b^2*c*d + 5*a^2*b*d^2)*x)/((b^7*c^2 - 2*a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3*(a*b^6*c^2 - 2*a^2*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*c*d + a^4*b^3*d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4) \\ & - 6*(3*b*c*d^2 - a*d^3)*\log(b*x + a)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4) + 6*(3*b*c*d^2 - a*d^3)*\log(d*x + c)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4) \\ & - 1/6*(3*b*x + a)*B*d*i*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) \\ & - 1/6*(3*b*x + a)*A*d*i/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) \\ & - 1/3*B*c*i*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4) \\ & - 1/3*A*c*i/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4) \end{aligned}$$

**Fricas [B]** time = 0.559639, size = 988, normalized size = 5.46

$$\frac{6(Bb^3cd^2 - Bab^2d^3)inx^2 - (4Bb^3c^3 - 9Bab^2c^2d + 5Ba^3d^3)in - 6(2Ab^3c^3 - 3Aab^2c^2d + Aa^3d^3)i - 3((Bb^3c^2d - 6Bab^2c^2d + 5Baa^2cd^2 - 3Baa^2b^2d^3)ix - 6(3(Bb^3c^2d - 2Baa^2b^2cd^2 + Baa^2b^2d^3)ix + (2Bb^3c^3 - 3Baa^2b^2cd^2 + Baa^3d^3)i) \log(e) + 6(Bb^3d^3inx^3 + 3Baa^2b^2d^3inx^2 - 3(Bb^3c^2d - 2Baa^2b^2cd^2)inx - (2Bb^3c^3 - 3Baa^2b^2cd^2)in) \log((bx+a)/(dx+c))}{36((b^7c^2 - 2b^6c^2d + a^2b^5d^2)g^4x^3 + 3(a^2b^6c^2 - 2a^2b^5cd + a^3b^4d^2)g^4x^2 + 3(a^2b^5c^2 - 2a^3b^4cd + a^4b^3d^2)g^4x + (a^3b^4c^2 - 2a^4b^3cd + a^5b^2d^2)g^4)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^4,x, algorithm="fricas")

[Out] 1/36\*(6\*(B\*b^3\*c\*d^2 - B\*a\*b^2\*d^3)\*i\*n\*x^2 - (4\*B\*b^3\*c^3 - 9\*B\*a\*b^2\*c^2\*d + 5\*B\*a^3\*d^3)\*i\*n - 6\*(2\*A\*b^3\*c^3 - 3\*A\*a\*b^2\*c^2\*d + A\*a^3\*d^3)\*i - 3\*((B\*b^3\*c^2\*d - 6\*B\*a\*b^2\*c\*d^2 + 5\*B\*a^2\*b\*d^3)\*i\*n + 6\*(A\*b^3\*c^2\*d - 2\*A\*a\*b^2\*c\*d^2 + A\*a^2\*b\*d^3)\*i)\*x - 6\*(3\*(B\*b^3\*c^2\*d - 2\*B\*a\*b^2\*c\*d^2 + B\*a^2\*b\*d^3)\*i\*x + (2\*B\*b^3\*c^3 - 3\*B\*a\*b^2\*c^2\*d + B\*a^3\*d^3)\*i)\*log(e) + 6\*(B\*b^3\*d^3\*i\*n\*x^3 + 3\*B\*a\*b^2\*d^3\*i\*n\*x^2 - 3\*(B\*b^3\*c^2\*d - 2\*B\*a\*b^2\*c\*d^2)\*i\*n\*x - (2\*B\*b^3\*c^3 - 3\*B\*a\*b^2\*c^2\*d)\*i\*n)\*log((b\*x + a)/(d\*x + c)))/((b^7\*c^2 - 2\*a\*b^6\*c\*d + a^2\*b^5\*d^2)\*g^4\*x^3 + 3\*(a\*b^6\*c^2 - 2\*a^2\*b^5\*c\*d + a^3\*b^4\*d^2)\*g^4\*x^2 + 3\*(a^2\*b^5\*c^2 - 2\*a^3\*b^4\*c\*d + a^4\*b^3\*d^2)\*g^4\*x + (a^3\*b^4\*c^2 - 2\*a^4\*b^3\*c\*d + a^5\*b^2\*d^2)\*g^4)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)\*\*4,x)

[Out] Timed out

**Giac [B]** time = 1.27089, size = 624, normalized size = 3.45

$$-\frac{Bd^3n \log(bx+a)}{6(b^4c^2g^4i - 2ab^3cdg^4i + a^2b^2d^2g^4i)} + \frac{Bd^3n \log(dx+c)}{6(b^4c^2g^4i - 2ab^3cdg^4i + a^2b^2d^2g^4i)} - \frac{(3Bbdinx + 2Bbcin + Badin) \log\left(\frac{bx+a}{dx+c}\right)}{6(b^5g^4x^3 + 3ab^4g^4x^2 + 3a^2b^3g^4x + a^3b^2g^4)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^4,x, algorithm="giac")

[Out] 
$$\begin{aligned} & -1/6*B*d^3*n*\log(b*x + a)/(b^4*c^2*g^4*i - 2*a*b^3*c*d*g^4*i + a^2*b^2*d^2*g^4*i) + 1/6*B*d^3*n*\log(d*x + c)/(b^4*c^2*g^4*i - 2*a*b^3*c*d*g^4*i + a^2*b^2*d^2*g^4*i) \\ & - 1/6*(3*B*b*d*i*n*x + 2*B*b*c*i*n + B*a*d*i*n)*\log((b*x + a)/(d*x + c))/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) \\ & + 1/36*(6*B*b^2*d^2*i*n*x^2 - 3*B*b^2*c*d*i*n*x + 15*B*a*b*d^2*i*n*x - 4*B*b^2*c^2*i*n + 5*B*a*b*c*d*i*n + 5*B*a^2*d^2*i*n - 18*A*b^2*c*d*i*x - 18*B*b^2*c*d*i*x \\ & + 18*A*a*b*d^2*i*x + 18*B*a*b*d^2*i*x - 12*A*b^2*c^2*i - 12*B*b^2*c^2*i + 6*A*a*b*c*d*i + 6*B*a*b*c*d*i + 6*A*a^2*d^2*i + 6*B*a^2*d^2*i)/ \\ & (b^6*c*g^4*x^3 - a*b^5*d*g^4*x^3 + 3*a*b^5*c*g^4*x^2 - 3*a^2*b^4*d*g^4*x^2 + 3*a^2*b^4*c*g^4*x - 3*a^3*b^3*d*g^4*x + a^3*b^3*c*g^4 - a^4*b^2*d*g^4) \end{aligned}$$

$$3.116 \quad \int \frac{(ci+dx) \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ag+bgx)^5} dx$$

**Optimal.** Leaf size=281

$$\frac{b^2 i(c+dx)^4 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{4g^5(a+bx)^4(bc-ad)^3} - \frac{d^2 i(c+dx)^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{2g^5(a+bx)^2(bc-ad)^3} + \frac{2bdi(c+dx)^3 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{3g^5(a+bx)^3(bc-ad)^3}$$

[Out]  $-(B*d^2*i*n*(c+d*x)^2)/(4*(b*c-a*d)^3*g^5*(a+b*x)^2) + (2*b*B*d*i*n*(c+d*x)^3)/(9*(b*c-a*d)^3*g^5*(a+b*x)^3) - (b^2*B*i*n*(c+d*x)^4)/(16*(b*c-a*d)^3*g^5*(a+b*x)^4) - (d^2*i*(c+d*x)^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(2*(b*c-a*d)^3*g^5*(a+b*x)^2) + (2*b*d*i*(c+d*x)^3*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(3*(b*c-a*d)^3*g^5*(a+b*x)^3) - (b^2*i*(c+d*x)^4*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(4*(b*c-a*d)^3*g^5*(a+b*x)^4)$

**Rubi [A]** time = 0.409461, antiderivative size = 269, normalized size of antiderivative = 0.96, number of steps used = 10, number of rules used = 4, integrand size = 41,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.098$ , Rules used = {2528, 2525, 12, 44}

$$\frac{di \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{3b^2g^5(a+bx)^3} - \frac{i(bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{4b^2g^5(a+bx)^4} - \frac{Bd^3in}{12b^2g^5(a+bx)(bc-ad)^2} + \frac{Bd^2in}{24b^2g^5(a+bx)^2(bc-ad)}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[\left( (c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) \right)/(a*g + b*g*x)^5, x]$

[Out]  $-(B*(b*c-a*d)*i*n)/(16*b^2*g^5*(a+b*x)^4) - (B*d*i*n)/(36*b^2*g^5*(a+b*x)^3) + (B*d^2*i*n)/(24*b^2*(b*c-a*d)*g^5*(a+b*x)^2) - (B*d^3*i*n)/(12*b^2*(b*c-a*d)^2*g^5*(a+b*x)) - (B*d^4*i*n*Log[a+b*x])/(12*b^2*(b*c-a*d)^3*g^5) - ((b*c-a*d)*i*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(4*b^2*g^5*(a+b*x)^4) - (d*i*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(3*b^2*g^5*(a+b*x)^3) + (B*d^4*i*n*Log[c+d*x])/(12*b^2*(b*c-a*d)^3*g^5)$

**Rule 2528**

$\text{Int}[\left( (a_.) + \text{Log}[(c_.)*(RFx_)^(p_.)]*(b_.) \right)^(n_.)*(RGx_), x\_Symbol] := \text{With}[\{u = \text{ExpandIntegrand}[(a + b*Log[c*RFx^p])^n, RGx, x]\}, \text{Int}[u, x] /; \text{SumQ}[u$

```
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

### Rubi steps

$$\begin{aligned}
\int \frac{(116c + 116dx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ag + b gx)^5} dx &= \int \left( \frac{116(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{bg^5(a + bx)^5} + \frac{116d \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{bg^5(a + bx)^4} \right) dx \\
&= \frac{(116d) \int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{(a+bx)^4} dx}{bg^5} + \frac{(116(bc - ad)) \int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{(a+bx)^5} dx}{bg^5} \\
&= -\frac{29(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g^5(a + bx)^4} - \frac{116d \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3b^2g^5(a + bx)^3} + \\
&= -\frac{29(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g^5(a + bx)^4} - \frac{116d \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3b^2g^5(a + bx)^3} + \\
&= -\frac{29(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g^5(a + bx)^4} - \frac{116d \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3b^2g^5(a + bx)^3} + \\
&= -\frac{29B(bc - ad)n}{4b^2g^5(a + bx)^4} - \frac{29Bdn}{9b^2g^5(a + bx)^3} + \frac{29Bd^2n}{6b^2(bc - ad)g^5(a + bx)^2} - \frac{29Bd^3n}{3b^2(bc - ad)g^5(a + bx)}
\end{aligned}$$

**Mathematica [A]** time = 0.530503, size = 220, normalized size = 0.78

$$\frac{i \left( \frac{36Abc}{(a+bx)^4} + \frac{48Ad}{(a+bx)^3} - \frac{36aAd}{(a+bx)^4} + \frac{12Bd^3n}{(a+bx)(bc-ad)^2} - \frac{6Bd^2n}{(a+bx)^2(bc-ad)} + \frac{12Bd^4n \log(a+bx)}{(bc-ad)^3} - \frac{12Bd^4n \log(c+dx)}{(bc-ad)^3} + \frac{12B(ad+3bc+4bdx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{(a+bx)^4} \right)}{144b^2g^5}$$

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(a\*g + b\*g\*x)^5,x]

[Out] -(i\*((36\*A\*b\*c)/(a + b\*x)^4 - (36\*a\*A\*d)/(a + b\*x)^4 + (9\*b\*B\*c\*n)/(a + b\*x)^4 - (9\*a\*B\*d\*n)/(a + b\*x)^4 + (48\*A\*d)/(a + b\*x)^3 + (4\*B\*d\*n)/(a + b\*x)^3 - (6\*B\*d^2\*n)/((b\*c - a\*d)\*(a + b\*x)^2) + (12\*B\*d^3\*n)/((b\*c - a\*d)^2\*(a + b\*x)) + (12\*B\*d^4\*n\*Log[a + b\*x])/(b\*c - a\*d)^3 + (12\*B\*(3\*b\*c + a\*d + 4\*b\*d\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n])/(a + b\*x)^4 - (12\*B\*d^4\*n\*Log[c + d\*x])/(b\*c - a\*d)^3))/(144\*b^2\*g^5)

---

**Maple [F]** time = 0.535, size = 0, normalized size = 0.

$$\int \frac{dix + ci}{(bgx + ag)^5} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^5,x)

[Out] int((d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^5,x)

---

**Maxima [B]** time = 1.62016, size = 1887, normalized size = 6.72

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^5,x, algorithm="maxima")

[Out] 
$$\frac{1}{48} B c i n \left( (12 b^3 d^3 x^3 - 3 b^3 c^3 + 13 a b^2 c^2 d - 23 a^2 b c d^2 + 25 a^3 d^3 - 6 (b^3 c d^2 - 7 a b^2 d^3) x^2 + 4 (b^3 c^2 d - 5 a b^2 c d^2 + 13 a^2 b d^3) x \right) / \left( (b^8 c^3 - 3 a b^7 c^2 d + 3 a^2 b^6 c d^2 - a^3 b^5 d^3) g^5 x^4 + 4 (a b^7 c^3 - 3 a^2 b^6 c^2 d + 3 a^3 b^5 c d^2 - a^4 b^4 d^3) g^5 x^3 + 6 (a^2 b^6 c^3 - 3 a^3 b^5 c^2 d + 3 a^4 b^4 c d^2 - a^5 b^3 d^3) g^5 x^2 + 4 (a^3 b^5 c^3 - 3 a^4 b^4 c^2 d + 3 a^5 b^3 c d^2 - a^6 b^2 d^3) g^5 x + (a^4 b^4 c^3 - 3 a^5 b^3 c^2 d + 3 a^6 b^2 c d^2 - a^7 b d^3) g^5 \right) + 12 d^4 \log(b x + a) / \left( (b^5 c^4 - 4 a b^4 c^3 d + 6 a^2 b^3 c^2 d^2 - 4 a^3 b^2 c d^3 + a^4 b d^4) g^5 \right) - 12 d^4 \log(d x + c) / \left( (b^5 c^4 - 4 a b^4 c^3 d + 6 a^2 b^3 c^2 d^2 - 4 a^3 b^2 c d^3 + a^4 b d^4) g^5 \right) - \frac{1}{144} B d i n \left( (7 a b^3 c^3 - 33 a^2 b^2 c^2 d + 75 a^3 b c d^2 - 13 a^4 d^3 + 12 (4 b^4 c d^2 - a b^3 d^3) x^3 - 6 (4 b^4 c^2 d - 29 a b^3 c d^2 + 7 a^2 b^2 d^3) x^2 + 4 (4 b^4 c^3 - 21 a b^3 c^2 d + 57 a^2 b^2 c d^2 - 13 a^3 b d^3) x \right) / \left( (b^9 c^3 - 3 a b^8 c^2 d + 3 a^2 b^7 c d^2 - a^3 b^6 d^3) g^5 x^4 + 4 (a b^8 c^3 - 3 a^2 b^7 c^2 d + 3 a^3 b^6 c d^2 - a^4 b^5 d^3) g^5 x^3 + 6 (a^2 b^7 c^3 - 3 a^3 b^6 c^2 d + 3 a^4 b^5 c d^2 - a^5 b^4 d^3) g^5 x^2 + 4 (a^3 b^6 c^3 - 3 a^4 b^5 c^2 d + 3 a^5 b^4 c d^2 - a^6 b^3 d^3) g^5 x + (a^4 b^5 c^3 - 3 a^5 b^4 c^2 d + 3 a^6 b^3 c d^2 - a^7 b^2 d^3) g^5 \right) + 12 (4 b c d^3 - a d^4) \log(b x + a) / \left( (b^6 c^4 - 4 a b^5 c^3 d + 6 a^2 b^4 c^2 d^2 - 4 a^3 b^3 c d^3 + a^4 b^2 d^4) g^5 \right) - 12 (4 b c d^3 - a d^4) \log(d x +$$

$$\frac{c)/((b^6c^4 - 4ab^5c^3d + 6a^2b^4c^2d^2 - 4a^3b^3cd^3 + a^4b^2d^4)g^5) - 1/12(4bx + a)Bd^i \log(e(bx/(dx + c) + a/(dx + c))^n)}{(b^6g^5x^4 + 4ab^5g^5x^3 + 6a^2b^4g^5x^2 + 4a^3b^3g^5x + a^4b^2g^5) - 1/12(4bx + a)A^d^i / (b^6g^5x^4 + 4ab^5g^5x^3 + 6a^2b^4g^5x^2 + 4a^3b^3g^5x + a^4b^2g^5) - 1/4B^c^i \log(e(bx/(dx + c) + a/(dx + c))^n) / (b^5g^5x^4 + 4ab^4g^5x^3 + 6a^2b^3g^5x^2 + 4a^3b^2g^5x + a^4b^1g^5) - 1/4A^c^i / (b^5g^5x^4 + 4ab^4g^5x^3 + 6a^2b^3g^5x^2 + 4a^3b^2g^5x + a^4b^1g^5)}$$

**Fricas [B]** time = 0.547895, size = 1574, normalized size = 5.6

$$12(Bb^4cd^3 - Bab^3d^4)inx^3 - 6(Bb^4c^2d^2 - 8Bab^3cd^3 + 7Ba^2b^2d^4)inx^2 + (9Bb^4c^4 - 32Bab^3c^3d + 36Ba^2b^2c^2d^2 - 13Ba^4$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^5,x, alg orithm="fricas")

[Out]  $-1/144*(12*(B*b^4*c*d^3 - B*a*b^3*d^4)*i*n*x^3 - 6*(B*b^4*c^2*d^2 - 8*B*a*b^3*c*d^3 + 7*B*a^2*b^2*d^4)*i*n*x^2 + (9*B*b^4*c^4 - 32*B*a*b^3*c^3*d + 36*B*a^2*b^2*c^2*d^2 - 13*B*a^4*d^4)*i*n + 12*(3*A*b^4*c^4 - 8*A*a*b^3*c^3*d + 6*A*a^2*b^2*c^2*d^2 - A*a^4*d^4)*i + 4*((B*b^4*c^3*d - 6*B*a*b^3*c^2*d^2 + 18*B*a^2*b^2*c*d^3 - 13*B*a^3*b*d^4)*i*n + 12*(A*b^4*c^3*d - 3*A*a*b^3*c^2*d^2 + 3*A*a^2*b^2*c*d^3 - A*a^3*b*d^4)*i)*x + 12*(4*(B*b^4*c^3*d - 3*B*a*b^3*c^2*d^2 + 3*B*a^2*b^2*c*d^3 - B*a^3*b*d^4)*i*x + (3*B*b^4*c^4 - 8*B*a*b^3*c^3*d + 6*B*a^2*b^2*c^2*d^2 - B*a^4*d^4)*i)*\log(e) + 12*(B*b^4*d^4*i*n*x^4 + 4*B*a*b^3*d^4*i*n*x^3 + 6*B*a^2*b^2*d^4*i*n*x^2 + 4*(B*b^4*c^3*d - 3*B*a*b^3*c^2*d^2 + 3*B*a^2*b^2*c*d^3)*i*n*x + (3*B*b^4*c^4 - 8*B*a*b^3*c^3*d + 6*B*a^2*b^2*c^2*d^2)*i*n)*\log((b*x + a)/(d*x + c)))/((b^9*c^3 - 3*a*b^8*c^2*d + 3*a^2*b^7*c*d^2 - a^3*b^6*d^3)*g^5*x^4 + 4*(a*b^8*c^3 - 3*a^2*b^7*c^2*d + 3*a^3*b^6*c*d^2 - a^4*b^5*d^3)*g^5*x^3 + 6*(a^2*b^7*c^3 - 3*a^3*b^6*c^2*d + 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)*g^5*x^2 + 4*(a^3*b^6*c^3 - 3*a^4*b^5*c^2*d + 3*a^5*b^4*c*d^2 - a^6*b^3*d^3)*g^5*x + (a^4*b^5*c^3 - 3*a^5*b^4*c^2*d + 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*g^5)$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out



Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n)))/(b\*g\*x+a\*g)\*\*5,x)

[Out] Timed out

**Giac [B]** time = 1.39094, size = 1025, normalized size = 3.65

$$\frac{Bd^4n \log(bx + a)}{12(b^5c^3g^5i - 3ab^4c^2dg^5i + 3a^2b^3cd^2g^5i - a^3b^2d^3g^5i)} - \frac{Bd^4n \log(dx + c)}{12(b^5c^3g^5i - 3ab^4c^2dg^5i + 3a^2b^3cd^2g^5i - a^3b^2d^3g^5i)} - \frac{1}{12(b^6g^5i - 3ab^5c^2dg^5i + 3a^2b^4cd^2g^5i - a^3b^3d^3g^5i)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n)))/(b\*g\*x+a\*g)^5,x, algorithm="giac")

[Out] 
$$\frac{1}{12}Bd^4n \log(bx + a) / (b^5c^3g^5i - 3a^2b^4c^2dg^5i + 3a^2b^3cd^2g^5i - a^3b^2d^3g^5i) - \frac{1}{12}Bd^4n \log(dx + c) / (b^5c^3g^5i - 3a^2b^4c^2dg^5i + 3a^2b^3cd^2g^5i - a^3b^2d^3g^5i) - \frac{1}{12} \frac{(4Bb^4d^3n^2x + 3Bb^3cd^3n^2x + B^2ad^3n^2) \log((bx + a)/(dx + c))}{(b^6g^5x^4 + 4a^2b^5g^5x^3 + 6a^2b^4cd^2g^5x^2 + 4a^3b^3g^5x + a^4b^2g^5) + \frac{1}{144}(12Bb^3d^3n^2x^3 - 6Bb^3cd^2n^2x^2 + 42B^2ab^2d^3n^2x^2 + 4B^2b^3c^2d^2n^2x - 20B^2ab^2cd^2n^2x + 52B^2a^2bd^3n^2x + 9B^2b^3c^3n - 23B^2ab^2c^2d^2n + 13B^2a^2b^2cd^2n + 13B^2a^3d^3n + 48A^2b^3c^2d^2x + 48B^2b^3c^2d^2x - 96A^2ab^2cd^2x - 96B^2ab^2cd^2x + 48A^2b^2d^3x + 48B^2a^2bd^3x + 36A^2b^3c^3 + 36B^2b^3c^3 - 60A^2ab^2c^2d - 60B^2ab^2c^2d + 12A^2a^2b^2cd^2 + 12B^2a^2b^2cd^2 + 12A^2a^3d^3 + 12B^2a^3d^3) / (b^8c^2g^5ix^4 - 2a^2b^7cdg^5ix^4 + a^2b^6d^2g^5ix^4 + 4a^2b^7c^2g^5ix^3 - 8a^2b^6cdg^5ix^3 + 4a^3b^5d^2g^5ix^3 + 6a^2b^6c^2g^5ix^2 - 12a^3b^5cdg^5ix^2 + 6a^4b^4d^2g^5ix^2 + 4a^3b^5c^2g^5ix - 8a^4b^4cdg^5ix + 4a^5b^3d^2g^5ix + a^4b^4c^2g^5i - 2a^5b^3cdg^5i + a^6b^2d^2g^5i)}$$

$$3.117 \quad \int (ag+bgx)^3(ci+dix)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx$$

**Optimal.** Leaf size=442

$$\frac{3b^2g^3i^2(c+dx)^5(bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{5d^4} + \frac{b^3g^3i^2(c+dx)^6 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{6d^4} - \frac{g^3i^2(c+dx)^3(bc-ad)^3}{3d}$$

[Out] (B\*(b\*c - a\*d)^5\*g^3\*i^2\*n\*x)/(60\*b^2\*d^3) + (B\*(b\*c - a\*d)^4\*g^3\*i^2\*n\*(c + d\*x)^2)/(120\*b\*d^4) - (19\*B\*(b\*c - a\*d)^3\*g^3\*i^2\*n\*(c + d\*x)^3)/(180\*d^4) + (13\*b\*B\*(b\*c - a\*d)^2\*g^3\*i^2\*n\*(c + d\*x)^4)/(120\*d^4) - (b^2\*B\*(b\*c - a\*d)\*g^3\*i^2\*n\*(c + d\*x)^5)/(30\*d^4) - ((b\*c - a\*d)^3\*g^3\*i^2\*(c + d\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(3\*d^4) + (3\*b\*(b\*c - a\*d)^2\*g^3\*i^2\*(c + d\*x)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(4\*d^4) - (3\*b^2\*(b\*c - a\*d)\*g^3\*i^2\*(c + d\*x)^5\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(5\*d^4) + (b^3\*g^3\*i^2\*(c + d\*x)^6\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(6\*d^4) + (B\*(b\*c - a\*d)^6\*g^3\*i^2\*n\*Log[(a + b\*x)/(c + d\*x)])/(60\*b^3\*d^4) + (B\*(b\*c - a\*d)^6\*g^3\*i^2\*n\*Log[c + d\*x])/(60\*b^3\*d^4)

**Rubi [A]** time = 0.685045, antiderivative size = 345, normalized size of antiderivative = 0.78, number of steps used = 14, number of rules used = 4, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.093$ , Rules used = {2528, 2525, 12, 43}

$$\frac{d^2g^3i^2(a+bx)^6 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{6b^3} + \frac{g^3i^2(a+bx)^4(bc-ad)^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{4b^3} + \frac{2dg^3i^2(a+bx)^5(bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{5b^3}$$

Antiderivative was successfully verified.

[In] Int[(a\*g + b\*g\*x)^3\*(c\*i + d\*i\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]), x]

[Out] -(B\*(b\*c - a\*d)^5\*g^3\*i^2\*n\*x)/(60\*b^2\*d^3) + (B\*(b\*c - a\*d)^4\*g^3\*i^2\*n\*(a + b\*x)^2)/(120\*b^3\*d^2) - (B\*(b\*c - a\*d)^3\*g^3\*i^2\*n\*(a + b\*x)^3)/(180\*b^3\*d) - (7\*B\*(b\*c - a\*d)^2\*g^3\*i^2\*n\*(a + b\*x)^4)/(120\*b^3) - (B\*d\*(b\*c - a\*d)\*g^3\*i^2\*n\*(a + b\*x)^5)/(30\*b^3) + ((b\*c - a\*d)^2\*g^3\*i^2\*(a + b\*x)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(4\*b^3) + (2\*d\*(b\*c - a\*d)\*g^3\*i^2\*(a + b\*x)^5\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(5\*b^3) + (d^2\*g^3\*i^2\*(a + b\*x)^6\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(6\*b^3) + (B\*(b\*c - a\*d)^6\*g^3\*i^2\*n\*Log[c + d\*x])/(60\*b^3\*d^4)

Rule 2528

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && LeQ[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\begin{aligned}
\int (117c + 117dx)^2 (ag + bgx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx &= \int \left( \frac{13689(bc - ad)^2 (ag + bgx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2} \right) dx \\
&= \frac{(13689(bc - ad)^2) \int (ag + bgx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx}{b^2} \\
&= \frac{13689(bc - ad)^2 g^3 (a + bx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{4b^3} + \frac{27378(bc - ad)^2 g^3 (a + bx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{4b^3} \\
&= \frac{13689(bc - ad)^2 g^3 (a + bx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{4b^3} + \frac{27378(bc - ad)^2 g^3 (a + bx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{4b^3} \\
&= \frac{13689(bc - ad)^2 g^3 (a + bx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{4b^3} + \frac{27378(bc - ad)^2 g^3 (a + bx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{4b^3} \\
&= -\frac{4563B(bc - ad)^5 g^3 nx}{20b^2 d^3} + \frac{4563B(bc - ad)^4 g^3 n(a + bx)^2}{40b^3 d^2}
\end{aligned}$$

**Mathematica [A]** time = 0.39755, size = 441, normalized size = 1.

$$\frac{g^3 i^2 \left( 60d^6 (a + bx)^6 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right) + 144d^5 (a + bx)^5 (bc - ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right) + 90d^4 (a + bx)^4 (bc - ad)^2 \right)}{b^3}$$

Antiderivative was successfully verified.

[In] Integrate[(a\*g + b\*g\*x)^3\*(c\*i + d\*i\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]),x]

[Out] (g^3\*i^2\*(90\*d^4\*(b\*c - a\*d)^2\*(a + b\*x)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 144\*d^5\*(b\*c - a\*d)\*(a + b\*x)^5\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 60\*d^6\*(a + b\*x)^6\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 15\*B\*(b\*c - a\*d)^3\*n\*(6\*b\*d\*(b\*c - a\*d)^2\*x + 3\*d^2\*(-(b\*c) + a\*d)\*(a + b\*x)^2 + 2\*d^3\*(a + b\*x)^3 - 6\*(b\*c - a\*d)^3\*Log[c + d\*x]) + 12\*B\*(b\*c - a\*d)^2\*n\*(12\*b\*d\*(b\*c - a\*d)^3\*x - 6\*d^2\*(b\*c - a\*d)^2\*(a + b\*x)^2 + 4\*d^3\*(b\*c - a\*d)\*(a + b\*x)^3 - 3\*d^4\*(a + b\*x)^4 - 12\*(b\*c - a\*d)^4\*Log[c + d\*x]) - B\*(b\*c - a\*d)\*n\*(60\*b\*d\*(b\*c - a\*d)^4\*x + 30\*d^2\*(-(b\*c) + a\*d)^3\*(a + b\*x)^2 + 20\*d^3\*(b\*c - a\*d)^2\*(a + b\*x)^3 + 15\*d^4\*(-(b\*c) + a\*d)\*(a + b\*x)^4 + 12\*d^5\*(

$$a + b*x)^5 - 60*(b*c - a*d)^5*\text{Log}[c + d*x]))/(360*b^3*d^4)$$

**Maple [F]** time = 0.631, size = 0, normalized size = 0.

$$\int (bgx + ag)^3 (dix + ci)^2 \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^3\*(d\*i\*x+c\*i)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n)),x)

[Out] int((b\*g\*x+a\*g)^3\*(d\*i\*x+c\*i)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n)),x)

**Maxima [B]** time = 1.5242, size = 2670, normalized size = 6.04

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n)),x, algorithm="maxima")

[Out]  $1/6*B*b^3*d^2*g^3*i^2*x^6*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/6*A*b^3*d^2*g^3*i^2*x^6 + 2/5*B*b^3*c*d*g^3*i^2*x^5*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/5*B*a*b^2*d^2*g^3*i^2*x^5*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 2/5*A*b^3*c*d*g^3*i^2*x^5 + 3/5*A*a*b^2*d^2*g^3*i^2*x^5 + 1/4*B*b^3*c^2*g^3*i^2*x^4*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/2*B*a*b^2*c*d*g^3*i^2*x^4*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/4*B*a^2*b*d^2*g^3*i^2*x^4*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/4*A*b^3*c^2*g^3*i^2*x^4 + 3/2*A*a*b^2*c*d*g^3*i^2*x^4 + 3/4*A*a^2*b*d^2*g^3*i^2*x^4 + B*a*b^2*c^2*g^3*i^2*x^3*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 2*B*a^2*b*c*d*g^3*i^2*x^3*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/3*B*a^3*d^2*g^3*i^2*x^3*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*a*b^2*c^2*g^3*i^2*x^3 + 2*A*a^2*b*c*d*g^3*i^2*x^3 + 1/3*A*a^3*d^2*g^3*i^2*x^3 + 3/2*B*a^2*b*c^2*g^3*i^2*x^2*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + B*a^3*c*d*g^3*i^2*x^2*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/2*A*a^2*b*c^2*g^3*i^2*x^2 + A*a^3*c*d*g^3*i^2*x^2 - 1/360*B*b^3*d^2*g^3*i^2*n*(60*a^6*\log(b*x + a)/b^6 - 60*c^6*\log(d*x + c)/d^6 + (12*(b^5*c*d^4 - a*b^4*d^5)*x^5 - 15*(b^5*c^2*d^3 - a^2*b^3*d^5)*x^4 + 20*(b^5*c^3*d^2 - a^3*b^2*d^5)*x^3 - 30*(b^5*c^4*d - a^4*b*d^5)*x^2 + 60*(b^5*c^5 - a^5)*x - 60*a^6*\log(b*x + a)/b^6 - 60*c^6*\log(d*x + c)/d^6)$

$$\begin{aligned}
& 5c^5 - a^5d^5) * x) / (b^5d^5) + 1/30 * B * b^3 * c * d * g^3 * i^2 * n * (12 * a^5 * \log(b * x + a) / b^5 - 12 * c^5 * \log(d * x + c) / d^5 - (3 * (b^4 * c * d^3 - a * b^3 * d^4) * x^4 - 4 * (b^4 * c^2 * d^2 - a^2 * b^2 * d^4) * x^3 + 6 * (b^4 * c^3 * d - a^3 * b * d^4) * x^2 - 12 * (b^4 * c^4 - a^4 * d^4) * x) / (b^4 * d^4)) + 1/20 * B * a * b^2 * d^2 * g^3 * i^2 * n * (12 * a^5 * \log(b * x + a) / b^5 - 12 * c^5 * \log(d * x + c) / d^5 - (3 * (b^4 * c * d^3 - a * b^3 * d^4) * x^4 - 4 * (b^4 * c^2 * d^2 - a^2 * b^2 * d^4) * x^3 + 6 * (b^4 * c^3 * d - a^3 * b * d^4) * x^2 - 12 * (b^4 * c^4 - a^4 * d^4) * x) / (b^4 * d^4)) - 1/24 * B * b^3 * c^2 * g^3 * i^2 * n * (6 * a^4 * \log(b * x + a) / b^4 - 6 * c^4 * \log(d * x + c) / d^4 + (2 * (b^3 * c * d^2 - a * b^2 * d^3) * x^3 - 3 * (b^3 * c^2 * d - a^2 * b * d^3) * x^2 + 6 * (b^3 * c^3 - a^3 * d^3) * x) / (b^3 * d^3)) - 1/4 * B * a * b^2 * c * d * g^3 * i^2 * n * (6 * a^4 * \log(b * x + a) / b^4 - 6 * c^4 * \log(d * x + c) / d^4 + (2 * (b^3 * c * d^2 - a * b^2 * d^3) * x^3 - 3 * (b^3 * c^2 * d - a^2 * b * d^3) * x^2 + 6 * (b^3 * c^3 - a^3 * d^3) * x) / (b^3 * d^3)) - 1/8 * B * a^2 * b * d^2 * g^3 * i^2 * n * (6 * a^4 * \log(b * x + a) / b^4 - 6 * c^4 * \log(d * x + c) / d^4 + (2 * (b^3 * c * d^2 - a * b^2 * d^3) * x^3 - 3 * (b^3 * c^2 * d - a^2 * b * d^3) * x^2 + 6 * (b^3 * c^3 - a^3 * d^3) * x) / (b^3 * d^3)) + 1/2 * B * a * b^2 * c^2 * g^3 * i^2 * n * (2 * a^3 * \log(b * x + a) / b^3 - 2 * c^3 * \log(d * x + c) / d^3 - ((b^2 * c * d - a * b * d^2) * x^2 - 2 * (b^2 * c^2 - a^2 * d^2) * x) / (b^2 * d^2)) + B * a^2 * b * c * d * g^3 * i^2 * n * (2 * a^3 * \log(b * x + a) / b^3 - 2 * c^3 * \log(d * x + c) / d^3 - ((b^2 * c * d - a * b * d^2) * x^2 - 2 * (b^2 * c^2 - a^2 * d^2) * x) / (b^2 * d^2)) + 1/6 * B * a^3 * d^2 * g^3 * i^2 * n * (2 * a^3 * \log(b * x + a) / b^3 - 2 * c^3 * \log(d * x + c) / d^3 - ((b^2 * c * d - a * b * d^2) * x^2 - 2 * (b^2 * c^2 - a^2 * d^2) * x) / (b^2 * d^2)) - 3/2 * B * a^2 * b * c^2 * g^3 * i^2 * n * (a^2 * \log(b * x + a) / b^2 - c^2 * \log(d * x + c) / d^2 + (b * c - a * d) * x / (b * d)) - B * a^3 * c * d * g^3 * i^2 * n * (a^2 * \log(b * x + a) / b^2 - c^2 * \log(d * x + c) / d^2 + (b * c - a * d) * x / (b * d)) + B * a^3 * c^2 * g^3 * i^2 * n * (a * \log(b * x + a) / b - c * \log(d * x + c) / d) + B * a^3 * c^2 * g^3 * i^2 * x * \log(e * (b * x / (d * x + c) + a / (d * x + c)))^n) + A * a^3 * c^2 * g^3 * i^2 * x
\end{aligned}$$

**Fricas [B]** time = 1.10175, size = 2202, normalized size = 4.98

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n)),x, algorithm="fricas")

[Out] 1/360\*(60\*A\*b^6\*d^6\*g^3\*i^2\*x^6 + 6\*(15\*B\*a^4\*b^2\*c^2\*d^4 - 6\*B\*a^5\*b\*c\*d^5 + B\*a^6\*d^6)\*g^3\*i^2\*n\*log(b\*x + a) + 6\*(B\*b^6\*c^6 - 6\*B\*a\*b^5\*c^5\*d + 15\*B\*a^2\*b^4\*c^4\*d^2 - 20\*B\*a^3\*b^3\*c^3\*d^3)\*g^3\*i^2\*n\*log(d\*x + c) - 12\*((B\*b^6\*c\*d^5 - B\*a\*b^5\*d^6)\*g^3\*i^2\*n - 6\*(2\*A\*b^6\*c\*d^5 + 3\*A\*a\*b^5\*d^6)\*g^3\*i^2\*x^5 - 3\*((7\*B\*b^6\*c^2\*d^4 + 6\*B\*a\*b^5\*c\*d^5 - 13\*B\*a^2\*b^4\*d^6)\*g^3\*i^2\*n - 30\*(A\*b^6\*c^2\*d^4 + 6\*A\*a\*b^5\*c\*d^5 + 3\*A\*a^2\*b^4\*d^6)\*g^3\*i^2)\*x^4 - 2\*((B\*b^6\*c^3\*d^3 + 39\*B\*a\*b^5\*c^2\*d^4 - 21\*B\*a^2\*b^4\*c\*d^5 - 19\*B\*a^3\*b^3\*d^6)\*g^3\*i^2\*n - 60\*(3\*A\*a\*b^5\*c^2\*d^4 + 6\*A\*a^2\*b^4\*c\*d^5 + A\*a^3\*b^3\*d^6)

$$\begin{aligned}
& *g^{3i^2} * x^3 + 3 * ((B * b^6 * c^4 * d^2 - 6 * B * a * b^5 * c^3 * d^3 - 30 * B * a^2 * b^4 * c^2 * d^4 \\
& + 34 * B * a^3 * b^3 * c * d^5 + B * a^4 * b^2 * d^6) * g^{3i^2 * n} + 60 * (3 * A * a^2 * b^4 * c^2 * d^4 \\
& + 2 * A * a^3 * b^3 * c * d^5) * g^{3i^2} * x^2 + 6 * (60 * A * a^3 * b^3 * c^2 * d^4 * g^{3i^2} - (B * b \\
& ^6 * c^5 * d - 6 * B * a * b^5 * c^4 * d^2 + 15 * B * a^2 * b^4 * c^3 * d^3 - 5 * B * a^3 * b^3 * c^2 * d^4 - \\
& 6 * B * a^4 * b^2 * c * d^5 + B * a^5 * b * d^6) * g^{3i^2 * n}) * x + 6 * (10 * B * b^6 * d^6 * g^{3i^2 * x^6} \\
& + 60 * B * a^3 * b^3 * c^2 * d^4 * g^{3i^2 * x} + 12 * (2 * B * b^6 * c * d^5 + 3 * B * a * b^5 * d^6) * g^{3i^2 * x^5} \\
& + 15 * (B * b^6 * c^2 * d^4 + 6 * B * a * b^5 * c * d^5 + 3 * B * a^2 * b^4 * d^6) * g^{3i^2 * x^4} \\
& + 20 * (3 * B * a * b^5 * c^2 * d^4 + 6 * B * a^2 * b^4 * c * d^5 + B * a^3 * b^3 * d^6) * g^{3i^2 * x^3} \\
& + 30 * (3 * B * a^2 * b^4 * c^2 * d^4 + 2 * B * a^3 * b^3 * c * d^5) * g^{3i^2 * x^2} * \log(e) + 6 * (10 * \\
& B * b^6 * d^6 * g^{3i^2 * n * x^6} + 60 * B * a^3 * b^3 * c^2 * d^4 * g^{3i^2 * n * x} + 12 * (2 * B * b^6 * c \\
& * d^5 + 3 * B * a * b^5 * d^6) * g^{3i^2 * n * x^5} + 15 * (B * b^6 * c^2 * d^4 + 6 * B * a * b^5 * c * d^5 + \\
& 3 * B * a^2 * b^4 * d^6) * g^{3i^2 * n * x^4} + 20 * (3 * B * a * b^5 * c^2 * d^4 + 6 * B * a^2 * b^4 * c * d^5 \\
& + B * a^3 * b^3 * d^6) * g^{3i^2 * n * x^3} + 30 * (3 * B * a^2 * b^4 * c^2 * d^4 + 2 * B * a^3 * b^3 * c * d \\
& ^5) * g^{3i^2 * n * x^2} * \log((b * x + a) / (d * x + c))) / (b^3 * d^4)
\end{aligned}$$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*\*3\*(d\*i\*x+c\*i)\*\*2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n)),x)

[Out] Timed out

**Giac [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n)),x, algorithm="giac")

[Out] Timed out

$$3.118 \quad \int (ag+bgx)^2(ci+dix)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx$$

**Optimal.** Leaf size=352

$$\frac{b^2 g^2 i^2 (c+dx)^5 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{5d^3} + \frac{g^2 i^2 (c+dx)^3 (bc-ad)^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{3d^3} - \frac{bg^2 i^2 (c+dx)^4 (bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{2d^3}$$

[Out]  $-(B*(b*c - a*d)^4*g^2*i^2*n*x)/(30*b^2*d^2) - (B*(b*c - a*d)^3*g^2*i^2*n*(c + d*x)^2)/(60*b*d^3) + (B*(b*c - a*d)^2*g^2*i^2*n*(c + d*x)^3)/(10*d^3) - (b*B*(b*c - a*d)*g^2*i^2*n*(c + d*x)^4)/(20*d^3) + ((b*c - a*d)^2*g^2*i^2*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*d^3) - (b*(b*c - a*d)*g^2*i^2*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d^3) + (b^2*g^2*i^2*(c + d*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(5*d^3) - (B*(b*c - a*d)^5*g^2*i^2*n*Log[(a + b*x)/(c + d*x)])/(30*b^3*d^3) - (B*(b*c - a*d)^5*g^2*i^2*n*Log[c + d*x])/(30*b^3*d^3)$

**Rubi [A]** time = 0.543196, antiderivative size = 310, normalized size of antiderivative = 0.88, number of steps used = 14, number of rules used = 4, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.093$ , Rules used = {2528, 2525, 12, 43}

$$\frac{d^2 g^2 i^2 (a+bx)^5 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{5b^3} + \frac{g^2 i^2 (a+bx)^3 (bc-ad)^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{3b^3} + \frac{dg^2 i^2 (a+bx)^4 (bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{2b^3}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[(a*g + b*g*x)^2*(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]), x]$

[Out]  $(B*(b*c - a*d)^4*g^2*i^2*n*x)/(30*b^2*d^2) - (B*(b*c - a*d)^3*g^2*i^2*n*(a + b*x)^2)/(60*b^3*d) - (B*(b*c - a*d)^2*g^2*i^2*n*(a + b*x)^3)/(10*b^3) - (B*d*(b*c - a*d)*g^2*i^2*n*(a + b*x)^4)/(20*b^3) + ((b*c - a*d)^2*g^2*i^2*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b^3) + (d*(b*c - a*d)*g^2*i^2*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*b^3) + (d^2*g^2*i^2*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(5*b^3) - (B*(b*c - a*d)^5*g^2*i^2*n*Log[c + d*x])/(30*b^3*d^3)$

**Rule 2528**

$\text{Int}[(a_. + \text{Log}[(c_.)*(RFx_)^(p_.)]*(b_.))^n*(RGx_), x\_Symbol] := \text{With}[\{u = \text{ExpandIntegrand}[(a + b*\text{Log}[c*RFx^p])^n, RGx, x]\}, \text{Int}[u, x] /; \text{SumQ}[u$



```
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && LeQ[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

### Rubi steps

$$\begin{aligned}
\int (118c + 118dx)^2(ag + bgx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx &= \int \left( \frac{(-bc + ad)^2 g^2 (118c + 118dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{d^2} \right) dx \\
&= \frac{(b^2 g^2) \int (118c + 118dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx}{13924 d^2} \\
&= \frac{13924 (bc - ad)^2 g^2 (c + dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3 d^3} \\
&= \frac{13924 (bc - ad)^2 g^2 (c + dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3 d^3} \\
&= \frac{13924 (bc - ad)^2 g^2 (c + dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3 d^3} \\
&= -\frac{6962 B (bc - ad)^4 g^2 n x}{15 b^2 d^2} - \frac{3481 B (bc - ad)^3 g^2 n (c + dx)^2}{15 b d^3} +
\end{aligned}$$

**Mathematica [A]** time = 0.26903, size = 374, normalized size = 1.06

$$g^2 i^2 \left( 12 d^5 (a + bx)^5 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right) + 30 d^4 (a + bx)^4 (bc - ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right) + 20 d^3 (a + bx)^3 (bc - ad)^2 \right)$$

Antiderivative was successfully verified.

[In] Integrate[(a\*g + b\*g\*x)^2\*(c+i + d\*i\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]),x]

[Out] (g^2\*i^2\*(20\*d^3\*(b\*c - a\*d)^2\*(a + b\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 30\*d^4\*(b\*c - a\*d)\*(a + b\*x)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 12\*d^5\*(a + b\*x)^5\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 10\*B\*(b\*c - a\*d)^3\*n\*(2\*b\*d\*(b\*c - a\*d)\*x - d^2\*(a + b\*x)^2 - 2\*(b\*c - a\*d)^2\*Log[c + d\*x]) - 5\*B\*(b\*c - a\*d)^2\*n\*(6\*b\*d\*(b\*c - a\*d)^2\*x + 3\*d^2\*(-(b\*c) + a\*d)\*(a + b\*x)^2 + 2\*d^3\*(a + b\*x)^3 - 6\*(b\*c - a\*d)^3\*Log[c + d\*x]) + B\*(b\*c - a\*d)\*n\*(12\*b\*d\*(b\*c - a\*d)^3\*x - 6\*d^2\*(b\*c - a\*d)^2\*(a + b\*x)^2 + 4\*d^3\*(b\*c - a\*d)\*(a + b\*x)^3 - 3\*d^4\*(a + b\*x)^4 - 12\*(b\*c - a\*d)^4\*Log[c + d\*x]))/(60\*b^3\*d^3)

**Maple [F]** time = 0.59, size = 0, normalized size = 0.

$$\int (bgx + ag)^2 (dix + ci)^2 \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n)),x)

[Out] int((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n)),x)

**Maxima [B]** time = 1.44025, size = 1804, normalized size = 5.12

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n)),x, a  
lgorithm="maxima")

[Out]  $1/5*B*b^2*d^2*g^2*i^2*x^5*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/5*A*b^2*d^2*g^2*i^2*x^5 + 1/2*B*b^2*c*d*g^2*i^2*x^4*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/2*B*a*b*d^2*g^2*i^2*x^4*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/2*A*b^2*c*d*g^2*i^2*x^4 + 1/2*A*a*b*d^2*g^2*i^2*x^4 + 1/3*B*b^2*c^2*g^2*i^2*x^3*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 4/3*B*a*b*c*d*g^2*i^2*x^3*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/3*B*a^2*d^2*g^2*i^2*x^3*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/3*A*b^2*c^2*g^2*i^2*x^3 + 4/3*A*a*b*c*d*g^2*i^2*x^3 + 1/3*A*a^2*d^2*g^2*i^2*x^3 + B*a*b*c^2*g^2*i^2*x^2*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + B*a^2*c*d*g^2*i^2*x^2*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*a*b*c^2*g^2*i^2*x^2 + A*a^2*c*d*g^2*i^2*x^2 + 1/60*B*b^2*d^2*g^2*i^2*n*(12*a^5*\log(b*x + a)/b^5 - 12*c^5*\log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4)) - 1/12*B*b^2*c*d*g^2*i^2*n*(6*a^4*\log(b*x + a)/b^4 - 6*c^4*\log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) - 1/12*B*a*b*d^2*g^2*i^2*n*(6*a^4*\log(b*x + a)/b^4 - 6*c^4*\log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + 1/6*B*b^2*c^2*g^2*i^2*n*(2*a^3*\log(b*x + a)/b^3 - 2*c^3*\log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) + 2/3*B*a*b*c*d*g^2*i^2*n*(2*a^3*\log(b*x +$

$$\begin{aligned} & a)/b^3 - 2*c^3*\log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - \\ & a^2*d^2)*x)/(b^2*d^2)) + 1/6*B*a^2*d^2*g^2*i^2*n*(2*a^3*\log(b*x + a)/b^3 - \\ & 2*c^3*\log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x \\ & )/(b^2*d^2)) - B*a*b*c^2*g^2*i^2*n*(a^2*\log(b*x + a)/b^2 - c^2*\log(d*x + c) \\ & /d^2 + (b*c - a*d)*x/(b*d)) - B*a^2*c*d*g^2*i^2*n*(a^2*\log(b*x + a)/b^2 - c \\ & ^2*\log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + B*a^2*c^2*g^2*i^2*n*(a*\log(b*x \\ & + a)/b - c*\log(d*x + c)/d) + B*a^2*c^2*g^2*i^2*x*\log(e*(b*x/(d*x + c) + a/ \\ & (d*x + c))^n) + A*a^2*c^2*g^2*i^2*x \end{aligned}$$

**Fricas [B]** time = 0.804151, size = 1573, normalized size = 4.47

$$12 Ab^5 d^5 g^2 i^2 x^5 + 2 (10 Ba^3 b^2 c^2 d^3 - 5 Ba^4 bcd^4 + Ba^5 d^5) g^2 i^2 n \log (bx + a) - 2 (Bb^5 c^5 - 5 Bab^4 c^4 d + 10 Ba^2 b^3 c^3 d^2) g^2 i^2 n \log (bx + a)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, a
lgorithm="fricas")
```

```
[Out] 1/60*(12*A*b^5*d^5*g^2*i^2*x^5 + 2*(10*B*a^3*b^2*c^2*d^3 - 5*B*a^4*b*c*d^4
+ B*a^5*d^5)*g^2*i^2*n*log(b*x + a) - 2*(B*b^5*c^5 - 5*B*a*b^4*c^4*d + 10*B
*a^2*b^3*c^3*d^2)*g^2*i^2*n*log(d*x + c) - 3*((B*b^5*c*d^4 - B*a*b^4*d^5)*g
^2*i^2*n - 10*(A*b^5*c*d^4 + A*a*b^4*d^5)*g^2*i^2)*x^4 - 2*(3*(B*b^5*c^2*d^
3 - B*a^2*b^3*d^5)*g^2*i^2*n - 10*(A*b^5*c^2*d^3 + 4*A*a*b^4*c*d^4 + A*a^2*
b^3*d^5)*g^2*i^2)*x^3 - ((B*b^5*c^3*d^2 + 15*B*a*b^4*c^2*d^3 - 15*B*a^2*b^3
*c*d^4 - B*a^3*b^2*d^5)*g^2*i^2*n - 60*(A*a*b^4*c^2*d^3 + A*a^2*b^3*c*d^4)*
g^2*i^2)*x^2 + 2*(30*A*a^2*b^3*c^2*d^3*g^2*i^2 + (B*b^5*c^4*d - 5*B*a*b^4*c
^3*d^2 + 5*B*a^3*b^2*c*d^4 - B*a^4*b*d^5)*g^2*i^2*n)*x + 2*(6*B*b^5*d^5*g^2
*i^2*x^5 + 30*B*a^2*b^3*c^2*d^3*g^2*i^2*x + 15*(B*b^5*c*d^4 + B*a*b^4*d^5)*
g^2*i^2*x^4 + 10*(B*b^5*c^2*d^3 + 4*B*a*b^4*c*d^4 + B*a^2*b^3*d^5)*g^2*i^2*
x^3 + 30*(B*a*b^4*c^2*d^3 + B*a^2*b^3*c*d^4)*g^2*i^2*x^2)*log(e) + 2*(6*B*b
^5*d^5*g^2*i^2*n*x^5 + 30*B*a^2*b^3*c^2*d^3*g^2*i^2*n*x + 15*(B*b^5*c*d^4 +
B*a*b^4*d^5)*g^2*i^2*n*x^4 + 10*(B*b^5*c^2*d^3 + 4*B*a*b^4*c*d^4 + B*a^2*b
^3*d^5)*g^2*i^2*n*x^3 + 30*(B*a*b^4*c^2*d^3 + B*a^2*b^3*c*d^4)*g^2*i^2*n*x^
2)*log((b*x + a)/(d*x + c)))/(b^3*d^3)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

---

**Giac [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac")
```

```
[Out] Timed out
```

$$3.119 \quad \int (ag + bgx)(ci + dix)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx$$

**Optimal.** Leaf size=250

$$\frac{gi^2(c+dx)^3(bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{3d^2} + \frac{bgi^2(c+dx)^4 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{4d^2} + \frac{Bgi^2n(bc-ad)^4 \log \left( \frac{a+bx}{c+dx} \right)}{12b^3d^2} + \dots$$

[Out] (B\*(b\*c - a\*d)^3\*g\*i^2\*n\*x)/(12\*b^2\*d) + (B\*(b\*c - a\*d)^2\*g\*i^2\*n\*(c + d\*x)^2)/(24\*b\*d^2) - (B\*(b\*c - a\*d)\*g\*i^2\*n\*(c + d\*x)^3)/(12\*d^2) - ((b\*c - a\*d)\*g\*i^2\*(c + d\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(3\*d^2) + (b\*g\*i^2\*(c + d\*x)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(4\*d^2) + (B\*(b\*c - a\*d)^4\*g\*i^2\*n\*Log[(a + b\*x)/(c + d\*x)])/(12\*b^3\*d^2) + (B\*(b\*c - a\*d)^4\*g\*i^2\*n\*Log[c + d\*x])/(12\*b^3\*d^2)

**Rubi [A]** time = 0.354676, antiderivative size = 210, normalized size of antiderivative = 0.84, number of steps used = 10, number of rules used = 4, integrand size = 41,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.098$ , Rules used = {2528, 2525, 12, 43}

$$\frac{gi^2(c+dx)^3(bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{3d^2} + \frac{bgi^2(c+dx)^4 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{4d^2} + \frac{Bgi^2n(bc-ad)^4 \log(a+bx)}{12b^3d^2} + \dots$$

Antiderivative was successfully verified.

[In] Int[(a\*g + b\*g\*x)\*(c\*i + d\*i\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]),x]

[Out] (B\*(b\*c - a\*d)^3\*g\*i^2\*n\*x)/(12\*b^2\*d) + (B\*(b\*c - a\*d)^2\*g\*i^2\*n\*(c + d\*x)^2)/(24\*b\*d^2) - (B\*(b\*c - a\*d)\*g\*i^2\*n\*(c + d\*x)^3)/(12\*d^2) + (B\*(b\*c - a\*d)^4\*g\*i^2\*n\*Log[a + b\*x])/(12\*b^3\*d^2) - ((b\*c - a\*d)\*g\*i^2\*(c + d\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(3\*d^2) + (b\*g\*i^2\*(c + d\*x)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(4\*d^2)

### Rule 2528

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*(RGx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

### Rule 2525

```

Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]

```

### Rule 12

```

Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]

```

### Rule 43

```

Int[((a_.) + (b_.)*(x_.))^(m_.)*((c_.) + (d_.)*(x_.))^(n_.), x_Symbol] := Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])

```

### Rubi steps

$$\begin{aligned}
\int (119c + 119dx)^2 (ag + bgx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx &= \int \left( \frac{(-bc + ad)g(119c + 119dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{d} \right) dx \\
&= \frac{(bg) \int (119c + 119dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx}{119d} + \frac{(-bc + ad)g(119c + 119dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{d} \\
&= -\frac{14161(bc - ad)g(c + dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3d^2} + \frac{14161(bc - ad)g(c + dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3d} \\
&= -\frac{14161(bc - ad)g(c + dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3d^2} + \frac{14161(bc - ad)g(c + dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3d} \\
&= -\frac{14161(bc - ad)g(c + dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3d^2} + \frac{14161(bc - ad)g(c + dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3d} \\
&= \frac{14161B(bc - ad)^3 gn x}{12b^2 d} + \frac{14161B(bc - ad)^2 gn (c + dx)^2}{24bd^2} - \frac{14161(bc - ad)g(c + dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3d^2}
\end{aligned}$$

**Mathematica [A]** time = 0.199186, size = 224, normalized size = 0.9

$$\frac{g^2 \left( 6b(c+dx)^4 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right) - 8(c+dx)^3(bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right) + \frac{4Bn(bc-ad)^2(2bdx(bc-ad)+2(bc-ad)^2 \log)}{b^3} \right)}{24d^2}$$

Antiderivative was successfully verified.

[In] Integrate[(a\*g + b\*g\*x)\*(c\*i + d\*i\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]),x]

[Out] (g\*i^2\*((4\*B\*(b\*c - a\*d)^2\*n\*(2\*b\*d\*(b\*c - a\*d)\*x + b^2\*(c + d\*x)^2 + 2\*(b\*c - a\*d)^2\*Log[a + b\*x]))/b^3 - (B\*(b\*c - a\*d)\*n\*(6\*b\*d\*(b\*c - a\*d)^2\*x + 3\*b^2\*(b\*c - a\*d)\*(c + d\*x)^2 + 2\*b^3\*(c + d\*x)^3 + 6\*(b\*c - a\*d)^3\*Log[a + b\*x]))/b^3 - 8\*(b\*c - a\*d)\*(c + d\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 6\*b\*(c + d\*x)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(24\*d^2)

**Maple [F]** time = 0.507, size = 0, normalized size = 0.

$$\int (bgx + ag)(dix + ci)^2 \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n)),x)

[Out] int((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n)),x)

**Maxima [B]** time = 1.33983, size = 999, normalized size = 4.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n)),x, algorithm="maxima")

[Out] 1/4\*B\*b\*d^2\*g\*i^2\*x^4\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n) + 1/4\*A\*b\*d^2\*g\*i^2\*x^4 + 2/3\*B\*b\*c\*d\*g\*i^2\*x^3\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n) +



$$\begin{aligned} & 1/3*B*a*d^2*g*i^2*x^3*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 2/3*A*b*c*d* \\ & g*i^2*x^3 + 1/3*A*a*d^2*g*i^2*x^3 + 1/2*B*b*c^2*g*i^2*x^2*\log(e*(b*x/(d*x + \\ & c) + a/(d*x + c))^n) + B*a*c*d*g*i^2*x^2*\log(e*(b*x/(d*x + c) + a/(d*x + c \\ & ))^n) + 1/2*A*b*c^2*g*i^2*x^2 + A*a*c*d*g*i^2*x^2 - 1/24*B*b*d^2*g*i^2*n*(6 \\ & *a^4*\log(b*x + a)/b^4 - 6*c^4*\log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3) \\ & *x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) \\ & + 1/3*B*b*c*d*g*i^2*n*(2*a^3*\log(b*x + a)/b^3 - 2*c^3*\log(d*x + c)/d^3 - (( \\ & b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) + 1/6*B*a*d^2* \\ & g*i^2*n*(2*a^3*\log(b*x + a)/b^3 - 2*c^3*\log(d*x + c)/d^3 - ((b^2*c*d - a*b* \\ & d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 1/2*B*b*c^2*g*i^2*n*(a^2* \\ & \log(b*x + a)/b^2 - c^2*\log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) - B*a*c*d*g*i \\ & ^2*n*(a^2*\log(b*x + a)/b^2 - c^2*\log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + \\ & B*a*c^2*g*i^2*n*(a*\log(b*x + a)/b - c*\log(d*x + c)/d) + B*a*c^2*g*i^2*x*\log \\ & (e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*a*c^2*g*i^2*x \end{aligned}$$

**Fricas [B]** time = 0.65275, size = 1107, normalized size = 4.43

$$6Ab^4d^4gi^2x^4 + 2(6Ba^2b^2c^2d^2 - 4Ba^3bcd^3 + Ba^4d^4)gi^2n \log(bx + a) + 2(Bb^4c^4 - 4Bab^3c^3d)gi^2n \log(dx + c) - 2((Bb$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n)),x, alg  
orithm="fricas")

[Out]  $1/24*(6*A*b^4*d^4*g*i^2*x^4 + 2*(6*B*a^2*b^2*c^2*d^2 - 4*B*a^3*b*c*d^3 + B* \\ a^4*d^4)*g*i^2*n*\log(b*x + a) + 2*(B*b^4*c^4 - 4*B*a*b^3*c^3*d)*g*i^2*n*\log \\ (d*x + c) - 2*((B*b^4*c*d^3 - B*a*b^3*d^4)*g*i^2*n - 4*(2*A*b^4*c*d^3 + A*a \\ *b^3*d^4)*g*i^2)*x^3 - ((5*B*b^4*c^2*d^2 - 4*B*a*b^3*c*d^3 - B*a^2*b^2*d^4) \\ *g*i^2*n - 12*(A*b^4*c^2*d^2 + 2*A*a*b^3*c*d^3)*g*i^2)*x^2 + 2*(12*A*a*b^3* \\ c^2*d^2*g*i^2 - (B*b^4*c^3*d + 2*B*a*b^3*c^2*d^2 - 4*B*a^2*b^2*c*d^3 + B*a^ \\ 3*b*d^4)*g*i^2*n)*x + 2*(3*B*b^4*d^4*g*i^2*x^4 + 12*B*a*b^3*c^2*d^2*g*i^2*x \\ + 4*(2*B*b^4*c*d^3 + B*a*b^3*d^4)*g*i^2*x^3 + 6*(B*b^4*c^2*d^2 + 2*B*a*b^3 \\ *c*d^3)*g*i^2*x^2)*\log(e) + 2*(3*B*b^4*d^4*g*i^2*n*x^4 + 12*B*a*b^3*c^2*d^2 \\ *g*i^2*n*x + 4*(2*B*b^4*c*d^3 + B*a*b^3*d^4)*g*i^2*n*x^3 + 6*(B*b^4*c^2*d^2 \\ + 2*B*a*b^3*c*d^3)*g*i^2*n*x^2)*\log((b*x + a)/(d*x + c)))/(b^3*d^2)$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

---

**Giac [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac")
```

```
[Out] Timed out
```

$$3.120 \quad \int (ci + dix)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx$$

**Optimal.** Leaf size=124

$$\frac{i^2(c+dx)^3 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{3d} - \frac{Bi^2nx(bc-ad)^2}{3b^2} - \frac{Bi^2n(bc-ad)^3 \log(a+bx)}{3b^3d} - \frac{Bi^2n(c+dx)^2(bc-ad)}{6bd}$$

[Out]  $-(B*(b*c - a*d)^2*i^2*n*x)/(3*b^2) - (B*(b*c - a*d)*i^2*n*(c + d*x)^2)/(6*b*d) - (B*(b*c - a*d)^3*i^2*n*Log[a + b*x])/(3*b^3*d) + (i^2*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*d)$

**Rubi [A]** time = 0.07449, antiderivative size = 124, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 33,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$ , Rules used = {2525, 12, 43}

$$\frac{i^2(c+dx)^3 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{3d} - \frac{Bi^2nx(bc-ad)^2}{3b^2} - \frac{Bi^2n(bc-ad)^3 \log(a+bx)}{3b^3d} - \frac{Bi^2n(c+dx)^2(bc-ad)}{6bd}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]), x]$

[Out]  $-(B*(b*c - a*d)^2*i^2*n*x)/(3*b^2) - (B*(b*c - a*d)*i^2*n*(c + d*x)^2)/(6*b*d) - (B*(b*c - a*d)^3*i^2*n*Log[a + b*x])/(3*b^3*d) + (i^2*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*d)$

### Rule 2525

$\text{Int}[(a_.) + \text{Log}[(c_.)*(\text{RFx}_.)^{(p_.)}*(b_.)^{(n_.)}*((d_.) + (e_.)*(x_.)^{(m_.)})], x\_Symbol] \rightarrow \text{Simp}[(d + e*x)^{(m+1)}*(a + b*\text{Log}[c*\text{RFx}^p])^n/(e*(m+1)), x] - \text{Dist}[(b*n*p)/(e*(m+1)), \text{Int}[\text{SimplifyIntegrand}[(d + e*x)^{(m+1)}*(a + b*\text{Log}[c*\text{RFx}^p])^{(n-1)}*D[\text{RFx}, x])/(\text{RFx}, x), x], x] /;$  FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

### Rule 12

$\text{Int}[(a_)*(u_), x\_Symbol] \rightarrow \text{Dist}[a, \text{Int}[u, x], x] /;$  FreeQ[a, x] && !MatchQ[u, (b\_)\*(v\_)] /; FreeQ[b, x]

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\begin{aligned} \int (120c + 120dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx &= \frac{4800(c+dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{d} - \frac{(Bn) \int \frac{1728000(bc-ad)(c+dx)^2}{a+bx} dx}{360d} \\ &= \frac{4800(c+dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{d} - \frac{(4800B(bc-ad)n) \int \frac{(c+dx)^2}{a+bx}}{d} \\ &= \frac{4800(c+dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{d} - \frac{(4800B(bc-ad)n) \int \left( \frac{d(bc-a)}{b^2} \right)}{d} \\ &= -\frac{4800B(bc-ad)^2 nx}{b^2} - \frac{2400B(bc-ad)n(c+dx)^2}{bd} - \frac{4800B(bc-ad)^3}{b^3 d} \end{aligned}$$

**Mathematica [A]** time = 0.0471789, size = 101, normalized size = 0.81

$$\frac{i^2 \left( (c+dx)^3 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right) - \frac{Bn(bc-ad)(2bdx(bc-ad)+2(bc-ad)^2 \log(a+bx)+b^2(c+dx)^2)}{2b^3} \right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] (i^2*(-(B*(b*c - a*d)*n*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b*c - a
*d)^2*Log[a + b*x]))/(2*b^3) + (c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x
))^n])))/(3*d)
```

**Maple [F]** time = 0.457, size = 0, normalized size = 0.

$$\int (dix + ci)^2 \left( A + B \ln \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)`

[Out] `int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)`

**Maxima [B]** time = 1.32109, size = 417, normalized size = 3.36

$$\frac{1}{3} B d^2 i^2 x^3 \log\left(e\left(\frac{b x}{d x+c}+\frac{a}{d x+c}\right)^n\right)+\frac{1}{3} A d^2 i^2 x^3+B c d i^2 x^2 \log\left(e\left(\frac{b x}{d x+c}+\frac{a}{d x+c}\right)^n\right)+A c d i^2 x^2+\frac{1}{6} B d^2 i^2 n\left(\frac{2 a^3 \log\left(\frac{b x}{d x+c}+\frac{a}{d x+c}\right)}{b^3}-\frac{2 c^3 \log(d x+c)}{d^3}-\left(\frac{b^2 c d-a b d^2}{b^2 d^2}\right) x^2-\frac{2\left(b^2 c^2-a^2 d^2\right) x}{b^2 d^2}\right)-B c d i^2 n\left(\frac{a^2 \log(b x+a)}{b^2}-\frac{c^2 \log(d x+c)}{d^2}+\frac{(b c-a d) x}{b d}\right)+B c^2 i^2 n\left(\frac{a \log(b x+a)}{b}-\frac{c \log(d x+c)}{d}\right)+B c^2 i^2 x \log\left(e\left(\frac{b x}{d x+c}+\frac{a}{d x+c}\right)^n\right)+A c^2 i^2 x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxima")`

[Out] `1/3*B*d^2*i^2*x^3*log(e*(b*x/(d*x+c)+a/(d*x+c))^n)+1/3*A*d^2*i^2*x^3+B*c*d*i^2*x^2*log(e*(b*x/(d*x+c)+a/(d*x+c))^n)+A*c*d*i^2*x^2+1/6*B*d^2*i^2*n*(2*a^3*log(b*x+a)/b^3-2*c^3*log(d*x+c)/d^3-((b^2*c*d-a*b*d^2)*x^2-2*(b^2*c^2-a^2*d^2)*x)/(b^2*d^2))-B*c*d*i^2*n*(a^2*log(b*x+a)/b^2-c^2*log(d*x+c)/d^2+(b*c-a*d)*x/(b*d))+B*c^2*i^2*n*(a*log(b*x+a)/b-c*log(d*x+c)/d)+B*c^2*i^2*x*log(e*(b*x/(d*x+c)+a/(d*x+c))^n)+A*c^2*i^2*x`

**Fricas [B]** time = 0.561858, size = 622, normalized size = 5.02

$$2 A b^3 d^3 i^2 x^3-2 B b^3 c^3 i^2 n \log(dx+c)+2\left(3 B a b^2 c^2 d-3 B a^2 b c d^2+B a^3 d^3\right) i^2 n \log(b x+a)+\left(6 A b^3 c d^2 i^2-\left(B b^3 c d^2-B b^3 c d^2-B b^3 c d^2\right) x^2+\left(6 A b^3 c d^2 i^2-\left(B b^3 c d^2-B b^3 c d^2\right) x^2+2\left(3 A b^3 c^2 d i^2-\left(2 B b^3 c^2 d-3 B a b^2 c d^2+B a^2 b d^3\right) i^2 n\right) x+2\left(B b^3 d^3 i^2 x^3+3 A b^3 c d^2 i^2 x\right)\right) i^2 n$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fricas")`

[Out] `1/6*(2*A*b^3*d^3*i^2*x^3-2*B*b^3*c^3*i^2*n*log(d*x+c)+2*(3*B*a*b^2*c^2*d-3*B*a^2*b*c*d^2+B*a^3*d^3)*i^2*n*log(b*x+a)+(6*A*b^3*c*d^2*i^2-(B*b^3*c*d^2-B*a*b^2*d^3)*i^2*n)*x^2+2*(3*A*b^3*c^2*d*i^2-(2*B*b^3*c^2*d-3*B*a*b^2*c*d^2+B*a^2*b*d^3)*i^2*n)*x+2*(B*b^3*d^3*i^2*x^3+3*A*b^3*c*d^2*i^2*x)`

$$\frac{B*b^3*c*d^2*i^2*x^2 + 3*B*b^3*c^2*d*i^2*x)*\log(e) + 2*(B*b^3*d^3*i^2*n*x^3 + 3*B*b^3*c*d^2*i^2*n*x^2 + 3*B*b^3*c^2*d*i^2*n*x)*\log((b*x + a)/(d*x + c))}{(b^3*d)}$$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*\*2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n)),x)

[Out] Timed out

**Giac [A]** time = 3.4415, size = 277, normalized size = 2.23

$$\frac{Bc^3n \log(dx + c)}{3d} - \frac{1}{3} (Ad^2 + Bd^2)x^3 + \frac{(Bbcdn - Bad^2n - 6Abcd - 6Bbcd)x^2}{6b} - \frac{1}{3} (Bd^2nx^3 + 3Bcdnx^2 + 3Bc^2nx) \log\left(\frac{b*x+a}{d*x+c}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n)),x, algorithm="giac")

[Out]  $\frac{1}{3}B*c^3*n*\log(d*x + c)/d - \frac{1}{3}*(A*d^2 + B*d^2)*x^3 + \frac{1}{6}*(B*b*c*d*n - B*a*d^2*n - 6*A*b*c*d - 6*B*b*c*d)*x^2/b - \frac{1}{3}*(B*d^2*n*x^3 + 3*B*c*d*n*x^2 + 3*B*c^2*n*x)*\log((b*x + a)/(d*x + c)) + \frac{1}{3}*(2*B*b^2*c^2*n - 3*B*a*b*c*d*n + B*a^2*d^2*n - 3*A*b^2*c^2 - 3*B*b^2*c^2)*x/b^2 - \frac{1}{3}*(3*B*a*b^2*c^2*n - 3*B*a^2*b*c*d*n + B*a^3*d^2*n)*\log(b*x + a)/b^3$

$$3.121 \quad \int \frac{(ci+dx)^2 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{ag+bgx} dx$$

**Optimal.** Leaf size=289

$$\frac{Bi^2n(bc-ad)^2 \text{PolyLog} \left( 2, \frac{b(c+dx)}{d(a+bx)} \right)}{b^3g} + \frac{di^2(a+bx)(bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{b^3g} - \frac{i^2(bc-ad)^2 \log \left( 1 - \frac{b(c+dx)}{d(a+bx)} \right) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{b^3g}$$

[Out]  $-(B*d*(b*c - a*d)*i^{2*n*x})/(2*b^2*g) + (d*(b*c - a*d)*i^{2*(a + b*x)}*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]))/(b^3*g) + (i^{2*(c + d*x)}^{2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]))}/(2*b*g) - (B*(b*c - a*d)^{2*i^{2*n}*Log[(a + b*x)/(c + d*x])})/(2*b^3*g) - (3*B*(b*c - a*d)^{2*i^{2*n}*Log[c + d*x]})/(2*b^3*g) - ((b*c - a*d)^{2*i^{2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]}*Log[1 - (b*(c + d*x))/(d*(a + b*x)])})/(b^3*g) + (B*(b*c - a*d)^{2*i^{2*n}*PolyLog[2, (b*(c + d*x))/(d*(a + b*x)])})/(b^3*g)$

**Rubi [A]** time = 0.489496, antiderivative size = 369, normalized size of antiderivative = 1.28, number of steps used = 18, number of rules used = 13, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.302$ , Rules used = {2528, 2486, 31, 2524, 2418, 2390, 12, 2301, 2394, 2393, 2391, 2525, 43}

$$\frac{Bi^2n(bc-ad)^2 \text{PolyLog} \left( 2, -\frac{d(a+bx)}{bc-ad} \right)}{b^3g} + \frac{i^2(bc-ad)^2 \log(ag+bgx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{b^3g} + \frac{Adi^2x(bc-ad)}{b^2g} + \frac{i^2(c+d)}{b^2g}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[\frac{(c*i + d*i*x)^{2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])}}{(a*g + b*g*x)}, x]$

[Out]  $(A*d*(b*c - a*d)*i^{2*x})/(b^2*g) - (B*d*(b*c - a*d)*i^{2*n*x})/(2*b^2*g) - (B*(b*c - a*d)^{2*i^{2*n}*Log[a + b*x]})/(2*b^3*g) - (B*(b*c - a*d)^{2*i^{2*n}*Log[g*(a + b*x)^2]})/(2*b^3*g) + (B*d*(b*c - a*d)*i^{2*(a + b*x)}*Log[e*((a + b*x)/(c + d*x))^n])/(b^3*g) + (i^{2*(c + d*x)}^{2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]))}/(2*b*g) - (B*(b*c - a*d)^{2*i^{2*n}*Log[c + d*x]})/(b^3*g) + ((b*c - a*d)^{2*i^{2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]}*Log[a*g + b*g*x]})/(b^3*g) + (B*(b*c - a*d)^{2*i^{2*n}*Log[(b*(c + d*x))/(b*c - a*d]}*Log[a*g + b*g*x]})/(b^3*g) + (B*(b*c - a*d)^{2*i^{2*n}*PolyLog[2, -((d*(a + b*x))/(b*c - a*d)])})/(b^3*g)$

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.)
^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q]^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(n_), x_Symbol] := Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x]]/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```



Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] := Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] := -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

Rule 2525

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*((d\_.) + (e\_.)\*(x\_)^(m\_.)), x\_Symbol] := Simp[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^n)/(e\*(m + 1)), x] - Dist[(b\*n\*p)/(e\*(m + 1)), Int[SimplifyIntegrand[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

Rule 43

Int[((a\_.) + (b\_.)\*(x\_)^(m\_.))\*((c\_.) + (d\_.)\*(x\_)^(n\_.)), x\_Symbol] := Int[ExpandIntegrand[(a + b\*x)^m\*(c + d\*x)^n, x], x] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b\*c - a\*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && LeQ[7\*m + 4\*n + 4, 0]) || LtQ[9\*m + 5\*(n + 1), 0] || GtQ[m + n + 2, 0])

Rubi steps

$$\begin{aligned}
\int \frac{(121c + 121dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{ag + bgx} dx &= \int \left( \frac{14641d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g} + \frac{121d(121c + 121dx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{bg} \right) dx \\
&= \frac{(14641(bc - ad)^2) \int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{ag+bgx} dx}{b^2} + \frac{(121d) \int (121c + 121dx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{bg} \\
&= \frac{14641Ad(bc - ad)x}{b^2g} + \frac{14641(c + dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{2bg} + \frac{14641Bd(bc - ad)(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^3g} + \frac{14641Bd(bc - ad)(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^3g} \\
&= \frac{14641Ad(bc - ad)x}{b^2g} + \frac{14641Bd(bc - ad)(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^3g} + \frac{14641Bd(bc - ad)(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^3g} \\
&= \frac{14641Ad(bc - ad)x}{b^2g} - \frac{14641Bd(bc - ad)nx}{2b^2g} - \frac{14641B(bc - ad)^2n \log(a + bx)}{2b^3g} \\
&= \frac{14641Ad(bc - ad)x}{b^2g} - \frac{14641Bd(bc - ad)nx}{2b^2g} - \frac{14641B(bc - ad)^2n \log(a + bx)}{2b^3g} \\
&= \frac{14641Ad(bc - ad)x}{b^2g} - \frac{14641Bd(bc - ad)nx}{2b^2g} - \frac{14641B(bc - ad)^2n \log(a + bx)}{2b^3g}
\end{aligned}$$

**Mathematica [A]** time = 0.185614, size = 264, normalized size = 0.91

$$i^2 \left( Bn(bc - ad)^2 \left( 2 \text{PolyLog} \left( 2, \frac{d(a+bx)}{ad-bc} \right) - \log(g(a + bx)) \left( \log(g(a + bx)) - 2 \log \left( \frac{b(c+dx)}{bc-ad} \right) \right) \right) + b^2(c + dx)^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) \right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a*g + b*g*x), x]
```

```
[Out] (i^2*(2*A*b*d*(b*c - a*d)*x - B*(b*c - a*d)*n*(b*d*x + (b*c - a*d)*Log[a + b*x]) + 2*B*d*(b*c - a*d)*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] + b^2*(c
```

$$+ d*x)^2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]) + 2*(b*c - a*d)^2*\text{Log}[g*(a + b*x)]*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]) - 2*B*(b*c - a*d)^2*n*\text{Log}[c + d*x] + B*(b*c - a*d)^2*n*(-(\text{Log}[g*(a + b*x)]*(\text{Log}[g*(a + b*x)] - 2*\text{Log}[(b*(c + d*x))/(b*c - a*d)])) + 2*\text{PolyLog}[2, (d*(a + b*x))/(-b*c + a*d)])))/(2*b^3*g)$$

**Maple [F]** time = 0.686, size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2}{bgx + ag} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*i\*x+c\*i)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g), x)

[Out] int((d\*i\*x+c\*i)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g), x)

**Maxima [B]** time = 3.19895, size = 783, normalized size = 2.71

$$2 Acdi^2 \left( \frac{x}{bg} - \frac{a \log(bx + a)}{b^2g} \right) + \frac{1}{2} Ad^2i^2 \left( \frac{2a^2 \log(bx + a)}{b^3g} + \frac{bx^2 - 2ax}{b^2g} \right) + \frac{Ac^2i^2 \log(bgx + ag)}{bg} - \frac{(3bc^2i^2n - 2acdi^2n)}{2b^2g}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g), x, algorithm="maxima")

[Out] 2\*A\*c\*d\*i^2\*(x/(b\*g) - a\*log(b\*x + a)/(b^2\*g)) + 1/2\*A\*d^2\*i^2\*(2\*a^2\*log(b\*x + a)/(b^3\*g) + (b\*x^2 - 2\*a\*x)/(b^2\*g)) + A\*c^2\*i^2\*log(b\*g\*x + a\*g)/(b\*g) - 1/2\*(3\*b\*c^2\*i^2\*n - 2\*a\*c\*d\*i^2\*n)\*B\*log(d\*x + c)/(b^2\*g) + (b^2\*c^2\*i^2\*n - 2\*a\*b\*c\*d\*i^2\*n + a^2\*d^2\*i^2\*n)\*(log(b\*x + a)\*log((b\*d\*x + a\*d)/(b\*c - a\*d) + 1) + dilog(-(b\*d\*x + a\*d)/(b\*c - a\*d)))\*B/(b^3\*g) + 1/2\*(B\*b^2\*d^2\*i^2\*x^2\*log(e) - (b^2\*c^2\*i^2\*n - 2\*a\*b\*c\*d\*i^2\*n + a^2\*d^2\*i^2\*n)\*B\*log(b\*x + a)^2 - ((i^2\*n - 4\*i^2\*log(e))\*b^2\*c\*d - (i^2\*n - 2\*i^2\*log(e))\*a\*b\*d^2)\*B\*x + (2\*b^2\*c^2\*i^2\*log(e) + 4\*(i^2\*n - i^2\*log(e))\*a\*b\*c\*d - (3\*i^2\*n - 2\*i^2\*log(e))\*a^2\*d^2)\*B\*log(b\*x + a) + (B\*b^2\*d^2\*i^2\*x^2 + 2\*(2\*b^2\*c\*d\*i^2 - a\*b\*d^2\*i^2)\*B\*x + 2\*(b^2\*c^2\*i^2 - 2\*a\*b\*c\*d\*i^2 + a^2\*d^2\*i^2)\*B\*log(b\*x + a))\*log((b\*x + a)^n) - (B\*b^2\*d^2\*i^2\*x^2 + 2\*(2\*b^2\*c\*d\*i^2 - a\*b\*d^2\*i^2)\*B\*x + 2\*(b^2\*c^2\*i^2 - 2\*a\*b\*c\*d\*i^2 + a^2\*d^2\*i^2)\*B\*log(b\*x

+ a))\*log((d\*x + c)^n))/(b^3\*g)

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{Ad^2i^2x^2 + 2Ac di^2x + Ac^2i^2 + (Bd^2i^2x^2 + 2Bcdi^2x + Bc^2i^2) \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right)}{bgx + ag}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g), x, algorithm="fricas")

[Out] integral((A\*d^2\*i^2\*x^2 + 2\*A\*c\*d\*i^2\*x + A\*c^2\*i^2 + (B\*d^2\*i^2\*x^2 + 2\*B\*c\*d\*i^2\*x + B\*c^2\*i^2)\*log(e\*((b\*x + a)/(d\*x + c))^n))/(b\*g\*x + a\*g), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*\*2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n))/(b\*g\*x+a\*g), x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2 \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)}{bgx + ag} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g), x, algorithm="giac")

```
[Out] integrate((d*i*x + c*i)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)/(b*g*x + a  
*g), x)
```

$$3.122 \quad \int \frac{(ci+dx)^2 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ag+bgx)^2} dx$$

**Optimal.** Leaf size=259

$$\frac{2Bdi^2n(bc-ad)\text{PolyLog}\left(2, \frac{b(c+dx)}{d(a+bx)}\right)}{b^3g^2} + \frac{d^2i^2(a+bx)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{b^3g^2} - \frac{i^2(c+dx)(bc-ad)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{b^2g^2(a+bx)}$$

[Out] -((B\*(b\*c - a\*d)\*i^2\*n\*(c + d\*x))/(b^2\*g^2\*(a + b\*x))) + (d^2\*i^2\*(a + b\*x)\* (A + B\*Log[ e\*((a + b\*x)/(c + d\*x))^n ]))/(b^3\*g^2) - ((b\*c - a\*d)\*i^2\*(c + d\*x)\*(A + B\*Log[ e\*((a + b\*x)/(c + d\*x))^n ]))/(b^2\*g^2\*(a + b\*x)) - (B\*d\*(b\*c - a\*d)\*i^2\*n\*Log[c + d\*x])/(b^3\*g^2) - (2\*d\*(b\*c - a\*d)\*i^2\*(A + B\*Log[ e\*((a + b\*x)/(c + d\*x))^n ])\*Log[1 - (b\*(c + d\*x))/(d\*(a + b\*x))])/(b^3\*g^2) + (2\*B\*d\*(b\*c - a\*d)\*i^2\*n\*PolyLog[2, (b\*(c + d\*x))/(d\*(a + b\*x))])/(b^3\*g^2)

**Rubi [A]** time = 0.522551, antiderivative size = 327, normalized size of antiderivative = 1.26, number of steps used = 17, number of rules used = 13, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.302$ , Rules used = {2528, 2486, 31, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{2Bdi^2n(bc-ad)\text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{b^3g^2} + \frac{2di^2(bc-ad)\log(a+bx)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{b^3g^2} - \frac{i^2(bc-ad)^2\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{b^3g^2(a+bx)}$$

Antiderivative was successfully verified.

[In] Int[((c\*i + d\*i\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(a\*g + b\*g\*x)^2, x]

[Out] (A\*d^2\*i^2\*x)/(b^2\*g^2) - (B\*(b\*c - a\*d)^2\*i^2\*n)/(b^3\*g^2\*(a + b\*x)) - (B\*d\*(b\*c - a\*d)\*i^2\*n\*Log[a + b\*x])/(b^3\*g^2) - (B\*d\*(b\*c - a\*d)\*i^2\*n\*Log[a + b\*x]^2)/(b^3\*g^2) + (B\*d^2\*i^2\*(a + b\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n])/(b^3\*g^2) - ((b\*c - a\*d)^2\*i^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(b^3\*g^2\*(a + b\*x)) + (2\*d\*(b\*c - a\*d)\*i^2\*Log[a + b\*x]\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(b^3\*g^2) + (2\*B\*d\*(b\*c - a\*d)\*i^2\*n\*Log[a + b\*x]\*Log[(b\*(c + d\*x))/(b\*c - a\*d)])/(b^3\*g^2) + (2\*B\*d\*(b\*c - a\*d)\*i^2\*n\*PolyLog[2, -((d\*(a + b\*x))/(b\*c - a\*d))])/(b^3\*g^2)

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.)
^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q]^r]^s - 1/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

### Rule 31

```
Int[((a_) + (b_.)*(x_))^(n_), x_Symbol] := Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
```

FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

### Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*(RFx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]

### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.)\*(x\_))^(q\_.), x\_Symbol] := Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] := Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n]))/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] := -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rubi steps



$$\begin{aligned}
\int \frac{(122c + 122dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ag + bgx)^2} dx &= \int \left( \frac{14884d^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g^2} + \frac{14884(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g^2(a + bx)^2} \right) dx \\
&= \frac{(14884d^2) \int \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx}{b^2g^2} + \frac{(29768d(bc - ad)) \int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{a + bx} dx}{b^2g^2} \\
&= \frac{14884Ad^2x}{b^2g^2} - \frac{14884(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3g^2(a + bx)} + \frac{29768d(bc - ad) \log(a + bx)}{b^3g^2} \\
&= \frac{14884Ad^2x}{b^2g^2} + \frac{14884Bd^2(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^3g^2} - \frac{14884(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3g^2} \\
&= \frac{14884Ad^2x}{b^2g^2} + \frac{14884Bd^2(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^3g^2} - \frac{14884(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3g^2} \\
&= \frac{14884Ad^2x}{b^2g^2} - \frac{14884B(bc - ad)^2n}{b^3g^2(a + bx)} - \frac{14884Bd(bc - ad)n \log(a + bx)}{b^3g^2} \\
&= \frac{14884Ad^2x}{b^2g^2} - \frac{14884B(bc - ad)^2n}{b^3g^2(a + bx)} - \frac{14884Bd(bc - ad)n \log(a + bx)}{b^3g^2} \\
&= \frac{14884Ad^2x}{b^2g^2} - \frac{14884B(bc - ad)^2n}{b^3g^2(a + bx)} - \frac{14884Bd(bc - ad)n \log(a + bx)}{b^3g^2}
\end{aligned}$$

**Mathematica [A]** time = 0.236218, size = 233, normalized size = 0.9

$$i^2 \left( Bdn(ad - bc) \left( \log(a + bx) \left( \log(a + bx) - 2 \log \left( \frac{b(c+dx)}{bc-ad} \right) \right) - 2 \text{PolyLog} \left( 2, \frac{d(a+bx)}{ad-bc} \right) \right) + 2d(bc - ad) \log(a + bx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) \right)$$

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(a\*g + b\*g\*x)^2,x]

```
[Out] (i^2*(A*b*d^2*x - (B*(b*c - a*d)^2*n)/(a + b*x) + B*d*(-(b*c) + a*d)*n*Log[
a + b*x] + B*d^2*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] - ((b*c - a*d)^2*
(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x) + 2*d*(b*c - a*d)*Log[a +
b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + B*d*(-(b*c) + a*d)*n*(Log[a
+ b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*
(a + b*x))/(-(b*c) + a*d)])))/(b^3*g^2)
```

**Maple [F]** time = 0.695, size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2}{(bgx + ag)^2} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x)
```

**Maxima [B]** time = 2.80036, size = 1607, normalized size = 6.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x, a
lgorithm="maxima")
```

```
[Out] -B*c^2*i^2*n*(1/(b^2*g^2*x + a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)*g^2
) - d*log(d*x + c)/((b^2*c - a*b*d)*g^2) - A*(a^2/(b^4*g^2*x + a*b^3*g^2)
- x/(b^2*g^2) + 2*a*log(b*x + a)/(b^3*g^2))*d^2*i^2 + 2*A*c*d*i^2*(a/(b^3*g
^2*x + a*b^2*g^2) + log(b*x + a)/(b^2*g^2)) - B*c^2*i^2*log(e*(b*x/(d*x + c
) + a/(d*x + c))^n)/(b^2*g^2*x + a*b*g^2) - A*c^2*i^2/(b^2*g^2*x + a*b*g^2)
- (b^2*c^2*d*i^2*n + a*b*c*d^2*i^2*n - a^2*d^3*i^2*n)*B*log(d*x + c)/(b^4*
c*g^2 - a*b^3*d*g^2) + ((b^3*c*d^2*i^2*log(e) - a*b^2*d^3*i^2*log(e))*B*x^2
+ (a*b^2*c*d^2*i^2*log(e) - a^2*b*d^3*i^2*log(e))*B*x - ((b^3*c^2*d*i^2*n
- 2*a*b^2*c*d^2*i^2*n + a^2*b*d^3*i^2*n)*B*x + (a*b^2*c^2*d*i^2*n - 2*a^2*b
*c*d^2*i^2*n + a^3*d^3*i^2*n)*B)*log(b*x + a)^2 + (2*(i^2*n + i^2*log(e))*a
*b^2*c^2*d - 3*(i^2*n + i^2*log(e))*a^2*b*c*d^2 + (i^2*n + i^2*log(e))*a^3*
d^3)*B + ((2*b^3*c^2*d*i^2*log(e) + (3*i^2*n - 4*i^2*log(e))*a*b^2*c*d^2 -
```

$$\begin{aligned}
& 2*(i^{2*n} - i^{2*\log(e)})*a^2*b*d^3*B*x + (2*a*b^2*c^2*d*i^2*\log(e) + (3*i^{2*n} \\
& - 4*i^{2*\log(e)})*a^2*b*c*d^2 - 2*(i^{2*n} - i^{2*\log(e)})*a^3*d^3*B)*\log(b*x \\
& + a) + ((b^3*c*d^2*i^2 - a*b^2*d^3*i^2)*B*x^2 + (a*b^2*c*d^2*i^2 - a^2*b*d^3 \\
& *i^2)*B*x + (2*a*b^2*c^2*d*i^2 - 3*a^2*b*c*d^2*i^2 + a^3*d^3*i^2)*B + 2*(( \\
& b^3*c^2*d*i^2 - 2*a*b^2*c*d^2*i^2 + a^2*b*d^3*i^2)*B*x + (a*b^2*c^2*d*i^2 - \\
& 2*a^2*b*c*d^2*i^2 + a^3*d^3*i^2)*B)*\log(b*x + a))*\log((b*x + a)^n) - ((b^3 \\
& *c*d^2*i^2 - a*b^2*d^3*i^2)*B*x^2 + (a*b^2*c*d^2*i^2 - a^2*b*d^3*i^2)*B*x + \\
& (2*a*b^2*c^2*d*i^2 - 3*a^2*b*c*d^2*i^2 + a^3*d^3*i^2)*B + 2*((b^3*c^2*d*i^2 \\
& - 2*a*b^2*c*d^2*i^2 + a^2*b*d^3*i^2)*B*x + (a*b^2*c^2*d*i^2 - 2*a^2*b*c*d \\
& ^2*i^2 + a^3*d^3*i^2)*B)*\log(b*x + a))*\log((d*x + c)^n))/(a*b^4*c*g^2 - a^2 \\
& *b^3*d*g^2 + (b^5*c*g^2 - a*b^4*d*g^2)*x) + 2*(b*c*d*i^2*n - a*d^2*i^2*n)* \\
& (\log(b*x + a)*\log((b*d*x + a*d)/(b*c - a*d) + 1) + \operatorname{dilog}(-(b*d*x + a*d)/(b*c \\
& - a*d)))*B/(b^3*g^2)
\end{aligned}$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{Ad^2i^2x^2 + 2Ac di^2x + Ac^2i^2 + (Bd^2i^2x^2 + 2Bcdi^2x + Bc^2i^2)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}{b^2g^2x^2 + 2abg^2x + a^2g^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x, algorithm="fricas")`

[Out] `integral((A*d^2*i^2*x^2 + 2*A*c*d*i^2*x + A*c^2*i^2 + (B*d^2*i^2*x^2 + 2*B*c*d*i^2*x + B*c^2*i^2)*log(e*((b*x + a)/(d*x + c))^n))/(b^2*g^2*x^2 + 2*a*b*g^2*x + a^2*g^2), x)`

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**2,x)`

[Out] Timed out

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2 \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)}{(bgx + ag)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x, algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)/(b*g*x + a*g)^2, x)
```

$$3.123 \quad \int \frac{(ci+dx)^2 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ag+bgx)^3} dx$$

**Optimal.** Leaf size=242

$$\frac{Bd^2i^2n \text{PolyLog} \left( 2, \frac{b(c+dx)}{d(a+bx)} \right)}{b^3g^3} - \frac{d^2i^2 \log \left( 1 - \frac{b(c+dx)}{d(a+bx)} \right) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{b^3g^3} - \frac{di^2(c+dx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{b^2g^3(a+bx)} - i^2 \log \left( \frac{b(c+dx)}{d(a+bx)} \right)$$

[Out]  $-\left(\frac{B*d*i^2*n*(c+d*x)}{b^2*g^3*(a+b*x)}\right) - \frac{(B*i^2*n*(c+d*x)^2)/(4*b*g^3*(a+b*x)^2) - (d*i^2*(c+d*x)*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(b^2*g^3*(a+b*x)) - (i^2*(c+d*x)^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(2*b*g^3*(a+b*x)^2) - (d^2*i^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n]) * Log[1 - (b*(c+d*x))/(d*(a+b*x))])/(b^3*g^3) + (B*d^2*i^2*n*PolyLog[2, (b*(c+d*x))/(d*(a+b*x))])/(b^3*g^3)}$

**Rubi [A]** time = 0.560004, antiderivative size = 354, normalized size of antiderivative = 1.46, number of steps used = 18, number of rules used = 11, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.256$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{Bd^2i^2n \text{PolyLog} \left( 2, -\frac{d(a+bx)}{bc-ad} \right)}{b^3g^3} + \frac{d^2i^2 \log(a+bx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{b^3g^3} - \frac{2di^2(bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{b^3g^3(a+bx)} - i^2 \log \left( -\frac{d(a+bx)}{bc-ad} \right)$$

Antiderivative was successfully verified.

[In]  $\text{Int}[\left(\frac{(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])}{(a*g + b*g*x)^3}, x\right)]$

[Out]  $-\left(\frac{B*(b*c - a*d)^2*i^2*n}{4*b^3*g^3*(a + b*x)^2}\right) - \frac{(3*B*d*(b*c - a*d)*i^2*n)/(2*b^3*g^3*(a + b*x)) - (3*B*d^2*i^2*n*Log[a + b*x])/(2*b^3*g^3) - (B*d^2*i^2*n*Log[a + b*x]^2)/(2*b^3*g^3) - ((b*c - a*d)^2*i^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(2*b^3*g^3*(a + b*x)^2) - (2*d*(b*c - a*d)*i^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(b^3*g^3*(a + b*x)) + (d^2*i^2*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(b^3*g^3) + (3*B*d^2*i^2*n*Log[c + d*x])/(2*b^3*g^3) + (B*d^2*i^2*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^3*g^3) + (B*d^2*i^2*n*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^3*g^3)}$

**Rule 2528**

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]
] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[
((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[
((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[
(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol] := With[
{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
```

qQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] :> Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :> Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n]))/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :> Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] :> -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rubi steps

$$\begin{aligned}
\int \frac{(123c + 123dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ag + bgx)^3} dx &= \int \left( \frac{15129(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2 g^3 (a + bx)^3} + \frac{30258d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2 g^3 (a + bx)^3} \right) dx \\
&= \frac{(15129d^2) \int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{a+bx} dx}{b^2 g^3} + \frac{(30258d(bc - ad)) \int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{(a+bx)^2} dx}{b^2 g^3} \\
&= -\frac{15129(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{2b^3 g^3 (a + bx)^2} - \frac{30258d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3 g^3 (a + bx)^2} \\
&= -\frac{15129(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{2b^3 g^3 (a + bx)^2} - \frac{30258d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3 g^3 (a + bx)^2} \\
&= -\frac{15129(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{2b^3 g^3 (a + bx)^2} - \frac{30258d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3 g^3 (a + bx)^2} \\
&= -\frac{15129B(bc - ad)^2 n}{4b^3 g^3 (a + bx)^2} - \frac{45387Bd(bc - ad)n}{2b^3 g^3 (a + bx)} - \frac{45387Bd^2 n \log(a + bx)}{2b^3 g^3} \\
&= -\frac{15129B(bc - ad)^2 n}{4b^3 g^3 (a + bx)^2} - \frac{45387Bd(bc - ad)n}{2b^3 g^3 (a + bx)} - \frac{45387Bd^2 n \log(a + bx)}{2b^3 g^3} \\
&= -\frac{15129B(bc - ad)^2 n}{4b^3 g^3 (a + bx)^2} - \frac{45387Bd(bc - ad)n}{2b^3 g^3 (a + bx)} - \frac{45387Bd^2 n \log(a + bx)}{2b^3 g^3}
\end{aligned}$$

**Mathematica [A]** time = 0.354789, size = 258, normalized size = 1.07

$$i^2 \left( -2Bd^2 n \left( \log(a + bx) \left( \log(a + bx) - 2 \log \left( \frac{b(c+dx)}{bc-ad} \right) \right) - 2 \text{PolyLog} \left( 2, \frac{d(a+bx)}{ad-bc} \right) \right) + 4d^2 \log(a + bx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right) \right)$$

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(a\*g + b\*g\*x)^3,x]



```
[Out] (i^2*(-((B*(b*c - a*d)^2*n)/(a + b*x)^2) + (6*B*d*(-(b*c) + a*d)*n)/(a + b*x) - 6*B*d^2*n*Log[a + b*x] - (2*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x)^2 + (8*d*(-(b*c) + a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x) + 4*d^2*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 6*B*d^2*n*Log[c + d*x] - 2*B*d^2*n*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/(4*b^3*g^3)
```

**Maple [F]** time = 0.671, size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2}{(bgx + ag)^3} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x)
```

**Maxima [F]** time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x, algorithm="maxima")
```

```
[Out] -1/2*B*c*d*i^2*n*((3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*d)*x)/((b^5*c - a*b^4*d)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)*g^3) + 2*(2*b*c*d - a*d^2)*log(b*x + a)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3) - 2*(2*b*c*d - a*d^2)*log(d*x + c)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3) + 1/4*B*c^2*i^2*n*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + 2*d^2*log(b*x + a)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) + 1/2*A*d^2*i^2*((4*a*b*x + 3*a^2)/((b^5*g^3*x^2 + 2*a*b^4*g^3*x + a^2*b^3*g^3) + 2*log(b*x + a)/(b^3*g^3)) + 1/2*B*d^2*i^2*((4*a*b*x + 3*a^2 + 2*(b^2*x^2 + 2*a*b*x + a^2)*log(b*x + a))*log((b*x + a)^n) - (4*a*b*x + 3*a^2 + 2*(b^2*x^2 + 2*a*b*x + a^2)*log(b
```

$x + a) \cdot \log((d \cdot x + c)^n) / (b^5 \cdot g^3 \cdot x^2 + 2 \cdot a \cdot b^4 \cdot g^3 \cdot x + a^2 \cdot b^3 \cdot g^3) + 2 \cdot \int \frac{1}{2} \cdot (2 \cdot b^3 \cdot d \cdot x^3 \cdot \log(e) + 2 \cdot b^3 \cdot c \cdot x^2 \cdot \log(e) - 3 \cdot a^2 \cdot b \cdot c \cdot n + 3 \cdot a^3 \cdot d \cdot n - 4 \cdot (a \cdot b^2 \cdot c \cdot n - a^2 \cdot b \cdot d \cdot n) \cdot x - 2 \cdot (a^2 \cdot b \cdot c \cdot n - a^3 \cdot d \cdot n + (b^3 \cdot c \cdot n - a \cdot b^2 \cdot d \cdot n) \cdot x^2 + 2 \cdot (a \cdot b^2 \cdot c \cdot n - a^2 \cdot b \cdot d \cdot n) \cdot x) \cdot \log(b \cdot x + a)) / (b^6 \cdot d \cdot g^3 \cdot x^4 + a^3 \cdot b^3 \cdot c \cdot g^3 + (b^6 \cdot c \cdot g^3 + 3 \cdot a \cdot b^5 \cdot d \cdot g^3) \cdot x^3 + 3 \cdot (a \cdot b^5 \cdot c \cdot g^3 + a^2 \cdot b^4 \cdot d \cdot g^3) \cdot x^2 + (3 \cdot a^2 \cdot b^4 \cdot c \cdot g^3 + a^3 \cdot b^3 \cdot d \cdot g^3) \cdot x), x) - (2 \cdot b \cdot x + a) \cdot B \cdot c \cdot d \cdot i^2 \cdot \log(e \cdot (b \cdot x / (d \cdot x + c) + a / (d \cdot x + c))^n) / (b^4 \cdot g^3 \cdot x^2 + 2 \cdot a \cdot b^3 \cdot g^3 \cdot x + a^2 \cdot b^2 \cdot g^3) - (2 \cdot b \cdot x + a) \cdot A \cdot c \cdot d \cdot i^2 / (b^4 \cdot g^3 \cdot x^2 + 2 \cdot a \cdot b^3 \cdot g^3 \cdot x + a^2 \cdot b^2 \cdot g^3) - 1/2 \cdot B \cdot c^2 \cdot i^2 \cdot \log(e \cdot (b \cdot x / (d \cdot x + c) + a / (d \cdot x + c))^n) / (b^3 \cdot g^3 \cdot x^2 + 2 \cdot a \cdot b^2 \cdot g^3 \cdot x + a^2 \cdot b \cdot g^3) - 1/2 \cdot A \cdot c^2 \cdot i^2 / (b^3 \cdot g^3 \cdot x^2 + 2 \cdot a \cdot b^2 \cdot g^3 \cdot x + a^2 \cdot b \cdot g^3)$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{A d^2 i^2 x^2 + 2 A c d i^2 x + A c^2 i^2 + (B d^2 i^2 x^2 + 2 B c d i^2 x + B c^2 i^2) \log \left( e \left( \frac{b x + a}{d x + c} \right)^n \right)}{b^3 g^3 x^3 + 3 a b^2 g^3 x^2 + 3 a^2 b g^3 x + a^3 g^3}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^3,x, algorithm="fricas")

[Out] integral((A\*d^2\*i^2\*x^2 + 2\*A\*c\*d\*i^2\*x + A\*c^2\*i^2 + (B\*d^2\*i^2\*x^2 + 2\*B\*c\*d\*i^2\*x + B\*c^2\*i^2)\*log(e\*((b\*x + a)/(d\*x + c))^n))/(b^3\*g^3\*x^3 + 3\*a\*b^2\*g^3\*x^2 + 3\*a^2\*b\*g^3\*x + a^3\*g^3), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*\*2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n))/(b\*g\*x+a\*g)\*\*3,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2 \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)}{(bgx + ag)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^3,x, algorithm="giac")

[Out] integrate((d\*i\*x + c\*i)^2\*(B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)/(b\*g\*x + a\*g)^3, x)

$$3.124 \quad \int \frac{(ci+dx)^2 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ag+bgx)^4} dx$$

**Optimal.** Leaf size=93

$$-\frac{i^2(c+dx)^3 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{3g^4(a+bx)^3(bc-ad)} - \frac{Bi^2n(c+dx)^3}{9g^4(a+bx)^3(bc-ad)}$$

[Out]  $-(B*i^2*n*(c+d*x)^3)/(9*(b*c-a*d)*g^4*(a+b*x)^3) - (i^2*(c+d*x)^3*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(3*(b*c-a*d)*g^4*(a+b*x)^3)$

**Rubi [B]** time = 0.515931, antiderivative size = 301, normalized size of antiderivative = 3.24, number of steps used = 14, number of rules used = 4, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.093$ , Rules used = {2528, 2525, 12, 44}

$$-\frac{d^2i^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{b^3g^4(a+bx)} - \frac{di^2(bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{b^3g^4(a+bx)^2} - \frac{i^2(bc-ad)^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{3b^3g^4(a+bx)^3} - \frac{Bd^3i^2n \log}{3b^3g^4(b}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[\frac{((c*i+d*x)^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))}{(a*g+b*g*x)^4}, x]$

[Out]  $-(B*(b*c-a*d)^2*i^2*n)/(9*b^3*g^4*(a+b*x)^3) - (B*d*(b*c-a*d)*i^2*n)/(3*b^3*g^4*(a+b*x)^2) - (B*d^2*i^2*n)/(3*b^3*g^4*(a+b*x)) - (B*d^3*i^2*n*Log[a+b*x])/(3*b^3*(b*c-a*d)*g^4) - ((b*c-a*d)^2*i^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(3*b^3*g^4*(a+b*x)^3) - (d*(b*c-a*d)*i^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(b^3*g^4*(a+b*x)^2) - (d^2*i^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(b^3*g^4*(a+b*x)) + (B*d^3*i^2*n*Log[c+d*x])/(3*b^3*(b*c-a*d)*g^4)$

### Rule 2528

$\text{Int}[\frac{((a_.) + \text{Log}[(c_.)*(Rfx_)^(p_.)]*(b_.))^n*(RGx_)}{x\_Symbol}] :> \text{With}[\{u = \text{ExpandIntegrand}[(a + b*\text{Log}[c*Rfx^p])^n, RGx, x]\}, \text{Int}[u, x] /; \text{SumQ}[u]] /; \text{FreeQ}[\{a, b, c, p\}, x] \&\& \text{RationalFunctionQ}[Rfx, x] \&\& \text{RationalFunctionQ}[RGx, x] \&\& \text{IGtQ}[n, 0]$

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{(124c + 124dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ag + bgx)^4} dx &= \int \left( \frac{15376(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2 g^4 (a + bx)^4} + \frac{30752d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2 g^4 (a + bx)^4} \right) dx \\
&= \frac{(15376d^2) \int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{(a+bx)^2} dx}{b^2 g^4} + \frac{(30752d(bc - ad)) \int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{(a+bx)^3} dx}{b^2 g^4} \\
&= -\frac{15376(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3b^3 g^4 (a + bx)^3} - \frac{15376d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3 g^4 (a + bx)^3} \\
&= -\frac{15376(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3b^3 g^4 (a + bx)^3} - \frac{15376d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3 g^4 (a + bx)^3} \\
&= -\frac{15376(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3b^3 g^4 (a + bx)^3} - \frac{15376d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3 g^4 (a + bx)^3} \\
&= -\frac{15376B(bc - ad)^2 n}{9b^3 g^4 (a + bx)^3} - \frac{15376Bd(bc - ad)n}{3b^3 g^4 (a + bx)^2} - \frac{15376Bd^2 n}{3b^3 g^4 (a + bx)} - \frac{15376Bd^3 n}{3b^3 g^4}
\end{aligned}$$

**Mathematica [B]** time = 0.337913, size = 329, normalized size = 3.54

$$i^2 \left( -9a^2 Abd^3 x - 3a^3 Ad^3 + 3B(bc - ad) (a^2 d^2 + abd(c + 3dx) + b^2 (c^2 + 3cdx + 3d^2 x^2)) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) - 9a^2 b B d^3 n x \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)$$

Antiderivative was successfully verified.

[In] Integrate[(((c\*i + d\*i\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(a\*g + b\*g\*x)^4, x]

[Out] -(i^2\*(3\*A\*b^3\*c^3 - 3\*a^3\*A\*d^3 + b^3\*B\*c^3\*n - a^3\*B\*d^3\*n + 9\*A\*b^3\*c^2\*d\*x - 9\*a^2\*A\*b\*d^3\*x + 3\*b^3\*B\*c^2\*d\*n\*x - 3\*a^2\*b\*B\*d^3\*n\*x + 9\*A\*b^3\*c\*d^2\*x^2 - 9\*a\*A\*b^2\*d^3\*x^2 + 3\*b^3\*B\*c\*d^2\*n\*x^2 - 3\*a\*b^2\*B\*d^3\*n\*x^2 + 3\*B\*d^3\*n\*(a + b\*x)^3\*Log[a + b\*x] + 3\*B\*(b\*c - a\*d)\*(a^2\*d^2 + a\*b\*d\*(c + 3\*d\*x) + b^2\*(c^2 + 3\*c\*d\*x + 3\*d^2\*x^2))\*Log[e\*((a + b\*x)/(c + d\*x))^n] - 3\*a^3\*B\*d^3\*n\*Log[c + d\*x] - 9\*a^2\*b\*B\*d^3\*n\*x\*Log[c + d\*x] - 9\*a\*b^2\*B\*d^3\*n\*x^2\*Log[c + d\*x] - 3\*b^3\*B\*d^3\*n\*x^3\*Log[c + d\*x]))/(9\*b^3\*(b\*c - a\*d)\*g^4\*(a + b\*x)^3)

---

**Maple [F]** time = 0.673, size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2}{(bgx + ag)^4} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*i\*x+c\*i)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^4,x)

[Out] int((d\*i\*x+c\*i)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^4,x)

---

**Maxima [B]** time = 1.61, size = 2084, normalized size = 22.41

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^4,x, algorithm="maxima")

[Out] 
$$\begin{aligned} & -1/18*B*d^2*i^2*n*((11*a^2*b^2*c^2 - 7*a^3*b*c*d + 2*a^4*d^2 + 6*(3*b^4*c^2 \\ & - 3*a*b^3*c*d + a^2*b^2*d^2)*x^2 + 3*(9*a*b^3*c^2 - 7*a^2*b^2*c*d + 2*a^3* \\ & b*d^2)*x)/((b^8*c^2 - 2*a*b^7*c*d + a^2*b^6*d^2)*g^4*x^3 + 3*(a*b^7*c^2 - 2 \\ & *a^2*b^6*c*d + a^3*b^5*d^2)*g^4*x^2 + 3*(a^2*b^6*c^2 - 2*a^3*b^5*c*d + a^4* \\ & b^4*d^2)*g^4*x + (a^3*b^5*c^2 - 2*a^4*b^4*c*d + a^5*b^3*d^2)*g^4) + 6*(3*b^ \\ & 2*c^2*d - 3*a*b*c*d^2 + a^2*d^3)*log(b*x + a)/((b^6*c^3 - 3*a*b^5*c^2*d + 3 \\ & *a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^4) - 6*(3*b^2*c^2*d - 3*a*b*c*d^2 + a^2*d^3 \\ & )*log(d*x + c)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g \\ & ^4) - 1/18*B*c^2*i^2*n*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^ \\ & 2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x \\ & ^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - \\ & 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b* \\ & d^2)*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 \\ & - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^ \\ & 2*c*d^2 - a^3*b*d^3)*g^4) - 1/18*B*c*d*i^2*n*((5*a*b^2*c^2 - 22*a^2*b*c*d \\ & + 5*a^3*d^2 - 6*(3*b^3*c*d - a*b^2*d^2)*x^2 + 3*(3*b^3*c^2 - 16*a*b^2*c*d + \\ & 5*a^2*b*d^2)*x)/((b^7*c^2 - 2*a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3*(a*b^6* \\ & c^2 - 2*a^2*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*c*d \\ & + a^4*b^3*d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4) - \end{aligned}$$

$$6*(3*b*c*d^2 - a*d^3)*\log(b*x + a)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4) + 6*(3*b*c*d^2 - a*d^3)*\log(d*x + c)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4) - 1/3*(3*b*x + a)*B*c*d*i^2*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) - 1/3*(3*b^2*x^2 + 3*a*b*x + a^2)*B*d^2*i^2*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^6*g^4*x^3 + 3*a*b^5*g^4*x^2 + 3*a^2*b^4*g^4*x + a^3*b^3*g^4) - 1/3*(3*b*x + a)*A*c*d*i^2/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) - 1/3*(3*b^2*x^2 + 3*a*b*x + a^2)*A*d^2*i^2/(b^6*g^4*x^3 + 3*a*b^5*g^4*x^2 + 3*a^2*b^4*g^4*x + a^3*b^3*g^4) - 1/3*B*c^2*i^2*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4) - 1/3*A*c^2*i^2/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4)$$

**Fricas [B]** time = 0.514387, size = 799, normalized size = 8.59

$$\frac{(Bb^3c^3 - Ba^3d^3)i^2n + 3(Ab^3c^3 - Aa^3d^3)i^2 + 3((Bb^3cd^2 - Bab^2d^3)i^2n + 3(Ab^3cd^2 - Aab^2d^3)i^2)x^2 + 3((Bb^3c^2d - Ba^2b^3c^2d^2) - Ba^2b^3c^2d^2)}{9((b^7c - a^7d)g^4x^3 + 3(a^6b^6c - a^2b^5d)g^4x^2 + 3(a^2b^5c - a^3b^4d)g^4x + (a^3b^4c - a^4b^3d)g^4)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^4,x, algorithm="fricas")

[Out] -1/9\*((B\*b^3\*c^3 - B\*a^3\*d^3)\*i^2\*n + 3\*(A\*b^3\*c^3 - A\*a^3\*d^3)\*i^2 + 3\*((B\*b^3\*c\*d^2 - B\*a\*b^2\*d^3)\*i^2\*n + 3\*(A\*b^3\*c\*d^2 - A\*a\*b^2\*d^3)\*i^2)\*x^2 + 3\*((B\*b^3\*c^2\*d - B\*a^2\*b\*d^3)\*i^2\*n + 3\*(A\*b^3\*c^2\*d - A\*a^2\*b\*d^3)\*i^2)\*x + 3\*(3\*(B\*b^3\*c\*d^2 - B\*a\*b^2\*d^3)\*i^2\*x^2 + 3\*(B\*b^3\*c^2\*d - B\*a^2\*b\*d^3)\*i^2\*x + (B\*b^3\*c^3 - B\*a^3\*d^3)\*i^2)\*log(e) + 3\*(B\*b^3\*d^3\*i^2\*n\*x^3 + 3\*B\*b^3\*c\*d^2\*i^2\*n\*x^2 + 3\*B\*b^3\*c^2\*d\*i^2\*n\*x + B\*b^3\*c^3\*i^2\*n)\*log((b\*x + a)/(d\*x + c)))/((b^7\*c - a\*b^6\*d)\*g^4\*x^3 + 3\*(a\*b^6\*c - a^2\*b^5\*d)\*g^4\*x^2 + 3\*(a^2\*b^5\*c - a^3\*b^4\*d)\*g^4\*x + (a^3\*b^4\*c - a^4\*b^3\*d)\*g^4)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*\*2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)\*\*4,x)



[Out] Timed out

**Giac [B]** time = 1.22472, size = 552, normalized size = 5.94

$$\frac{Bd^3n \log(bx + a)}{3(b^4cg^4 - ab^3dg^4)} - \frac{Bd^3n \log(dx + c)}{3(b^4cg^4 - ab^3dg^4)} + \frac{(3Bb^2d^2nx^2 + 3Bb^2cdnx + 3Babd^2nx + Bb^2c^2n + Babcdn + Ba^2d^2n) \log\left(\frac{bx+a}{dx+c}\right)}{3(b^6g^4x^3 + 3ab^5g^4x^2 + 3a^2b^4g^4x + a^3b^3g^4)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^4,x, algorithm="giac")

[Out]  $\frac{1}{3}Bd^3n \log(bx + a)/(b^4c^2g^4 - a^2b^3d^2g^4) - \frac{1}{3}Bd^3n \log(dx + c)/(b^4c^2g^4 - a^2b^3d^2g^4) + \frac{1}{3} \frac{(3Bb^2d^2nx^2 + 3Bb^2cdnx + 3Babd^2nx + Bb^2c^2n + Babcdn + Ba^2d^2n) \log\left(\frac{bx+a}{dx+c}\right)}{(b^6g^4x^3 + 3a^2b^4g^4x + a^3b^3g^4)} + \frac{1}{9} \frac{(3Bb^2d^2nx^2 + 3Bb^2cdnx + 3Babd^2nx + 9A^2b^2d^2x^2 + 9Bb^2d^2x^2 + Bb^2c^2n + B^2a^2d^2n + 9A^2b^2cdx + 9Bb^2cdx + 9A^2abd^2x + 9Babd^2x + 3A^2b^2c^2 + 3Bb^2c^2 + 3A^2abc^2d + 3Babc^2d + 3A^2a^2d^2 + 3B^2a^2d^2)}{(b^6g^4x^3 + 3a^2b^4g^4x + a^3b^3g^4)}$

$$3.125 \quad \int \frac{(ci+dx)^2 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ag+bgx)^5} dx$$

**Optimal.** Leaf size=189

$$\frac{bi^2(c+dx)^4 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{4g^5(a+bx)^4(bc-ad)^2} + \frac{di^2(c+dx)^3 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{3g^5(a+bx)^3(bc-ad)^2} - \frac{bBi^2n(c+dx)^4}{16g^5(a+bx)^4(bc-ad)^2} + \frac{Bdi^2n(c+dx)^4}{9g^5(a+bx)^3(bc-ad)^2}$$

[Out]  $(B*d*i^{2*n}*(c+d*x)^3)/(9*(b*c-a*d)^2*g^5*(a+b*x)^3) - (b*B*i^{2*n}*(c+d*x)^4)/(16*(b*c-a*d)^2*g^5*(a+b*x)^4) + (d*i^{2*n}*(c+d*x)^3*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(3*(b*c-a*d)^2*g^5*(a+b*x)^3) - (b*i^{2*n}*(c+d*x)^4*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(4*(b*c-a*d)^2*g^5*(a+b*x)^4)$

**Rubi [A]** time = 0.60018, antiderivative size = 340, normalized size of antiderivative = 1.8, number of steps used = 14, number of rules used = 4, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.093$ , Rules used = {2528, 2525, 12, 44}

$$\frac{d^2i^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{2b^3g^5(a+bx)^2} - \frac{2di^2(bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{3b^3g^5(a+bx)^3} - \frac{i^2(bc-ad)^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{4b^3g^5(a+bx)^4} + \frac{Bdi^2n(c+dx)^4}{12b^3g^5(a+bx)^3}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[\frac{((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))}{(a*g + b*g*x)^5}, x]$

[Out]  $-(B*(b*c-a*d)^2*i^{2*n})/(16*b^3*g^5*(a+b*x)^4) - (5*B*d*(b*c-a*d)*i^{2*n})/(36*b^3*g^5*(a+b*x)^3) - (B*d^2*i^{2*n})/(24*b^3*g^5*(a+b*x)^2) + (B*d^3*i^{2*n})/(12*b^3*(b*c-a*d)*g^5*(a+b*x)) + (B*d^4*i^{2*n}*Log[a+b*x])/(12*b^3*(b*c-a*d)^2*g^5) - ((b*c-a*d)^2*i^{2*n}*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(4*b^3*g^5*(a+b*x)^4) - (2*d*(b*c-a*d)*i^{2*n}*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(3*b^3*g^5*(a+b*x)^3) - (d^2*i^{2*n}*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(2*b^3*g^5*(a+b*x)^2) - (B*d^4*i^{2*n}*Log[c+d*x])/(12*b^3*(b*c-a*d)^2*g^5)$

**Rule 2528**

$\text{Int}[(a_. + \text{Log}[(c_.)*(RFx_)^(p_.)]*(b_.))^n*(RGx_), x\_Symbol] := \text{With}[\{u = \text{ExpandIntegrand}[(a + b*\text{Log}[c*RFx^p])^n, RGx, x]\}, \text{Int}[u, x] /; \text{SumQ}[u$

```
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

### Rubi steps

$$\begin{aligned}
\int \frac{(125c + 125dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ag + bgx)^5} dx &= \int \left( \frac{15625(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2 g^5 (a + bx)^5} + \frac{31250d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2 g^5 (a + bx)^4} \right) dx \\
&= \frac{(15625d^2) \int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{(a+bx)^3} dx}{b^2 g^5} + \frac{(31250d(bc - ad)) \int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{(a+bx)^4} dx}{b^2 g^5} \\
&= -\frac{15625(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{4b^3 g^5 (a + bx)^4} - \frac{31250d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3b^3 g^5 (a + bx)^3} \\
&= -\frac{15625(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{4b^3 g^5 (a + bx)^4} - \frac{31250d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3b^3 g^5 (a + bx)^3} \\
&= -\frac{15625(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{4b^3 g^5 (a + bx)^4} - \frac{31250d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3b^3 g^5 (a + bx)^3} \\
&= -\frac{15625B(bc - ad)^2 n}{16b^3 g^5 (a + bx)^4} - \frac{78125Bd(bc - ad)n}{36b^3 g^5 (a + bx)^3} - \frac{15625Bd^2 n}{24b^3 g^5 (a + bx)^2} + \frac{Bd^2 i^2 n}{12b^3 g^5 (a + bx)}
\end{aligned}$$

**Mathematica [B]** time = 0.432689, size = 474, normalized size = 2.51

$$-\frac{d^2 i^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{2b^3 g^5 (a + bx)^2} - \frac{2d i^2 (bc - ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{3b^3 g^5 (a + bx)^3} - \frac{i^2 (bc - ad)^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{4b^3 g^5 (a + bx)^4} - \frac{Bd^2 i^2 n}{12b^3 g^5 (a + bx)}$$

Antiderivative was successfully verified.

[In] Integrate[(((c\*i + d\*i\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(a\*g + b\*g\*x)^5, x]

[Out] -((b\*c - a\*d)^2\*i^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(4\*b^3\*g^5\*(a + b\*x)^4) - (2\*d\*(b\*c - a\*d)\*i^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(3\*b^3\*g^5\*(a + b\*x)^3) - (d^2\*i^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(2\*b^3\*g^5\*(a + b\*x)^2) - (B\*d^2\*i^2\*n\*((a + b\*x)^(-2) - (2\*d)/((b\*c - a\*d)\*(a + b\*x)) - (2\*d^2\*Log[a + b\*x])/(b\*c - a\*d)^2 + (2\*d^2\*Log[c + d\*x])/(b\*c - a\*d)^2))/(4\*b^3\*g^5) - (B\*d\*i^2\*n\*((2\*(b\*c - a\*d))/(a + b\*x)^3 - (3\*d)/(a + b\*x)^2 + (6\*d^2)/((b\*c - a\*d)\*(a + b\*x)) + (6\*d^3\*Log[a + b\*x])/(b\*c - a\*d)^2 - (6\*d^3\*Log[c + d\*x])/(b\*c - a\*d)^2))/(9\*b^3\*g^5) - (B\*i^2\*n\*((3\*(b\*c

$$- a*d)^2)/(a + b*x)^4 - (4*d*(b*c - a*d))/(a + b*x)^3 + (6*d^2)/(a + b*x)^2 - (12*d^3)/((b*c - a*d)*(a + b*x)) - (12*d^4*\text{Log}[a + b*x])/((b*c - a*d)^2 + (12*d^4*\text{Log}[c + d*x])/((b*c - a*d)^2))/(48*b^3*g^5)$$

**Maple [F]** time = 0.688, size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2}{(bgx + ag)^5} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*i\*x+c\*i)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^5,x)

[Out] int((d\*i\*x+c\*i)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^5,x)

**Maxima [B]** time = 1.95532, size = 3033, normalized size = 16.05

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^5,x, algorithm="maxima")

[Out]  $\frac{1}{48}B*c^2*i^2*n*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 25*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2 + 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 1/144*B*d^2*i^2*n*((13*a^2*b^3*c^3 - 75*a^3*b^2*c^2*d + 33*a^4*b*c*d^2 - 7*a^5*d^3 - 12*(6*b^5*c^2*d - 4*a*b^4*c*d^2 + a^2*b^3*d^3)*x^3 + 6*(6*b^5*c^3 - 46*a*b^4*c^2*d + 29*a^2*b^3*c*d^2 - 7*a^3*b^2*d^3)*x^2 + 4*(10*a*b^4*c^3 - 63*a^2*b^3*c^2*d + 33*a^3*b^2*c*d^2 - 7*a^4*b*d^3)*x)/((b^10*c^3 - 3*a*b^9*c^2*d + 3*a^2*b^8*c*d^2 - a^3*b^7*d^3)*g^5*x^4 + 4*(a*b^9*c^3 - 3*a^2*b^8*c$

$$\begin{aligned}
& c^2d + 3a^3b^7cd^2 - a^4b^6d^3)g^5x^3 + 6(a^2b^8c^3 - 3a^3b^7 \\
& *c^2d + 3a^4b^6cd^2 - a^5b^5d^3)g^5x^2 + 4(a^3b^7c^3 - 3a^4b^6 \\
& *c^2d + 3a^5b^5cd^2 - a^6b^4d^3)g^5x + (a^4b^6c^3 - 3a^5b^5c \\
& ^2d + 3a^6b^4cd^2 - a^7b^3d^3)g^5) - 12(6b^2c^2d^2 - 4a*bcd^3 \\
& + a^2d^4)*\log(b*x + a)/((b^7c^4 - 4a*b^6c^3d + 6a^2b^5c^2d^2 - 4 \\
& *a^3b^4cd^3 + a^4b^3d^4)g^5) + 12(6b^2c^2d^2 - 4a*bcd^3 + a^2d \\
& ^4)*\log(dx + c)/((b^7c^4 - 4a*b^6c^3d + 6a^2b^5c^2d^2 - 4a^3b^4 \\
& *cd^3 + a^4b^3d^4)g^5) - 1/72*B*c*d*i^2*n*((7a*b^3c^3 - 33a^2b^2c \\
& ^2d + 75a^3b*cd^2 - 13a^4d^3 + 12(4b^4cd^2 - a*b^3d^3)*x^3 - 6( \\
& 4b^4c^2d - 29a*b^3cd^2 + 7a^2b^2d^3)*x^2 + 4(4b^4c^3 - 21a*b^3 \\
& *c^2d + 57a^2b^2cd^2 - 13a^3b*d^3)*x)/((b^9c^3 - 3a*b^8c^2d + 3a \\
& ^2b^7cd^2 - a^3b^6d^3)g^5x^4 + 4(a*b^8c^3 - 3a^2b^7c^2d + 3a \\
& ^3b^6cd^2 - a^4b^5d^3)g^5x^3 + 6(a^2b^7c^3 - 3a^3b^6c^2d + 3a \\
& ^4b^5cd^2 - a^5b^4d^3)g^5x^2 + 4(a^3b^6c^3 - 3a^4b^5c^2d + 3 \\
& *a^5b^4cd^2 - a^6b^3d^3)g^5x + (a^4b^5c^3 - 3a^5b^4c^2d + 3a^6 \\
& b^3cd^2 - a^7b^2d^3)g^5) + 12(4b*cd^3 - a*d^4)*\log(b*x + a)/((b^6 \\
& *c^4 - 4a*b^5c^3d + 6a^2b^4c^2d^2 - 4a^3b^3cd^3 + a^4b^2d^4)g \\
& ^5) - 12(4b*cd^3 - a*d^4)*\log(dx + c)/((b^6c^4 - 4a*b^5c^3d + 6a^2 \\
& *b^4c^2d^2 - 4a^3b^3cd^3 + a^4b^2d^4)g^5) - 1/6(4b*x + a)*B*c*d \\
& *i^2*\log(e*(b*x/(dx + c) + a/(dx + c))^n)/(b^6g^5x^4 + 4a*b^5g^5x^3 \\
& + 6a^2b^4g^5x^2 + 4a^3b^3g^5x + a^4b^2g^5) - 1/12(6b^2x^2 + 4a \\
& *b*x + a^2)*B*d^2*i^2*\log(e*(b*x/(dx + c) + a/(dx + c))^n)/(b^7g^5x^4 \\
& + 4a*b^6g^5x^3 + 6a^2b^5g^5x^2 + 4a^3b^4g^5x + a^4b^3g^5) - 1/ \\
& 6(4b*x + a)*A*c*d*i^2/(b^6g^5x^4 + 4a*b^5g^5x^3 + 6a^2b^4g^5x^2 \\
& + 4a^3b^3g^5x + a^4b^2g^5) - 1/12(6b^2x^2 + 4a*b*x + a^2)*A*d^2*i \\
& ^2/(b^7g^5x^4 + 4a*b^6g^5x^3 + 6a^2b^5g^5x^2 + 4a^3b^4g^5x + a \\
& ^4b^3g^5) - 1/4B*c^2*i^2*\log(e*(b*x/(dx + c) + a/(dx + c))^n)/(b^5g^5 \\
& *x^4 + 4a*b^4g^5x^3 + 6a^2b^3g^5x^2 + 4a^3b^2g^5x + a^4b*g^5) - \\
& 1/4A*c^2*i^2/(b^5g^5x^4 + 4a*b^4g^5x^3 + 6a^2b^3g^5x^2 + 4a^3b \\
& ^2g^5x + a^4b*g^5)
\end{aligned}$$

**Fricas [B]** time = 0.558484, size = 1446, normalized size = 7.65

$$12(Bb^4cd^3 - Bab^3d^4)i^2nx^3 - (9Bb^4c^4 - 16Bab^3c^3d + 7Ba^4d^4)i^2n - 12(3Ab^4c^4 - 4Aab^3c^3d + Aa^4d^4)i^2 - 6((Bb^4c^2d^2 -$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^5,x, algorithm="fricas")

```
[Out] 1/144*(12*(B*b^4*c*d^3 - B*a*b^3*d^4)*i^2*n*x^3 - (9*B*b^4*c^4 - 16*B*a*b^3*c^3*d + 7*B*a^4*d^4)*i^2*n - 12*(3*A*b^4*c^4 - 4*A*a*b^3*c^3*d + A*a^4*d^4)*i^2 - 6*((B*b^4*c^2*d^2 - 8*B*a*b^3*c*d^3 + 7*B*a^2*b^2*d^4)*i^2*n + 12*(A*b^4*c^2*d^2 - 2*A*a*b^3*c*d^3 + A*a^2*b^2*d^4)*i^2)*x^2 - 4*((5*B*b^4*c^3*d - 12*B*a*b^3*c^2*d^2 + 7*B*a^3*b*d^4)*i^2*n + 12*(2*A*b^4*c^3*d - 3*A*a*b^3*c^2*d^2 + A*a^3*b*d^4)*i^2)*x - 12*(6*(B*b^4*c^2*d^2 - 2*B*a*b^3*c*d^3 + B*a^2*b^2*d^4)*i^2*x^2 + 4*(2*B*b^4*c^3*d - 3*B*a*b^3*c^2*d^2 + B*a^3*b*d^4)*i^2*x + (3*B*b^4*c^4 - 4*B*a*b^3*c^3*d + B*a^4*d^4)*i^2)*log(e) + 12*(B*b^4*d^4*i^2*n*x^4 + 4*B*a*b^3*d^4*i^2*n*x^3 - 6*(B*b^4*c^2*d^2 - 2*B*a*b^3*c*d^3)*i^2*n*x^2 - 4*(2*B*b^4*c^3*d - 3*B*a*b^3*c^2*d^2)*i^2*n*x - (3*B*b^4*c^4 - 4*B*a*b^3*c^3*d)*i^2*n)*log((b*x + a)/(d*x + c)))/((b^9*c^2 - 2*a*b^8*c*d + a^2*b^7*d^2)*g^5*x^4 + 4*(a*b^8*c^2 - 2*a^2*b^7*c*d + a^3*b^6*d^2)*g^5*x^3 + 6*(a^2*b^7*c^2 - 2*a^3*b^6*c*d + a^4*b^5*d^2)*g^5*x^2 + 4*(a^3*b^6*c^2 - 2*a^4*b^5*c*d + a^5*b^4*d^2)*g^5*x + (a^4*b^5*c^2 - 2*a^5*b^4*c*d + a^6*b^3*d^2)*g^5)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**5,x)
```

```
[Out] Timed out
```

**Giac [B]** time = 1.31058, size = 942, normalized size = 4.98

$$-\frac{Bd^4n \log(bx + a)}{12(b^5c^2g^5 - 2ab^4cdg^5 + a^2b^3d^2g^5)} + \frac{Bd^4n \log(dx + c)}{12(b^5c^2g^5 - 2ab^4cdg^5 + a^2b^3d^2g^5)} + \frac{(6Bb^2d^2nx^2 + 8Bb^2cdnx + 4Babd^2nx + 6a^2b^2d^2g^5)}{12(b^7g^5x^4 + 4ab^6g^5x^3 + 6a^2b^5d^2g^5)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^5,x, algorithm="giac")
```

```
[Out] -1/12*B*d^4*n*log(b*x + a)/(b^5*c^2*g^5 - 2*a*b^4*c*d*g^5 + a^2*b^3*d^2*g^5) + 1/12*B*d^4*n*log(d*x + c)/(b^5*c^2*g^5 - 2*a*b^4*c*d*g^5 + a^2*b^3*d^2*g^5) + 1/12*(6*B*b^2*d^2*n*x^2 + 8*B*b^2*c*d*n*x + 4*B*a*b*d^2*n*x + 3*B*b^
```

$$\begin{aligned}
& 2c^{2n} + 2Bab^3cd^n + Ba^2d^{2n}) \log((bx + a)/(dx + c)) / (b^7g^5x^4 + 4a^6b^6g^5x^3 + 6a^2b^5g^5x^2 + 4a^3b^4g^5x + a^4b^3g^5) - \\
& 1/144(12Bb^3d^3n^2x^3 - 6Bb^3cd^2n^2x^2 + 42Bab^2d^3n^2x^2 - 20 \\
& Bb^3c^2d^2n^2x + 28Bab^2cd^2n^2x + 28Ba^2bd^3n^2x - 72Ab^3cd^2x^2 - 72Bb^3cd^2x^2 + 72Aab^2d^3x^2 + 72Bab^2d^3x^2 - 9B \\
& b^3c^3n + 7Bab^2c^2d^2n + 7Ba^2b^2cd^2n + 7Ba^3d^3n - 96Ab^3c^2d^2x - 96Bb^3c^2d^2x + 48Aab^2cd^2x + 48Bab^2cd^2x + 4 \\
& 8Aa^2bd^3x + 48Ba^2bd^3x - 36Ab^3c^3 - 36Bb^3c^3 + 12Aab^2c^2d + 12Bab^2c^2d + 12Aa^2b^2cd^2 + 12Ba^2b^2cd^2 + 12Aa^3 \\
& 3d^3 + 12Ba^3d^3) / (b^8c^5g^5x^4 - ab^7d^5g^5x^4 + 4a^6b^7c^5g^5x^3 - 4a^2b^6d^5g^5x^3 + 6a^2b^6c^5g^5x^2 - 6a^3b^5d^5g^5x^2 + 4a^3b^5c^5g^5x - 4a^4b^4d^5g^5x + a^4b^4c^5g^5 - a^5b^3d^5g^5)
\end{aligned}$$



$$3.126 \quad \int \frac{(ci+dx)^2 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ag+bgx)^6} dx$$

**Optimal.** Leaf size=293

$$\frac{b^2 i^2 (c+dx)^5 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{5g^6 (a+bx)^5 (bc-ad)^3} - \frac{d^2 i^2 (c+dx)^3 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{3g^6 (a+bx)^3 (bc-ad)^3} + \frac{bd i^2 (c+dx)^4 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{2g^6 (a+bx)^4 (bc-ad)^3}$$

[Out]  $-(B*d^2*i^2*n*(c+d*x)^3)/(9*(b*c-a*d)^3*g^6*(a+b*x)^3) + (b*B*d*i^2*n*(c+d*x)^4)/(8*(b*c-a*d)^3*g^6*(a+b*x)^4) - (b^2*B*i^2*n*(c+d*x)^5)/(25*(b*c-a*d)^3*g^6*(a+b*x)^5) - (d^2*i^2*(c+d*x)^3*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(3*(b*c-a*d)^3*g^6*(a+b*x)^3) + (b*d*i^2*(c+d*x)^4*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(2*(b*c-a*d)^3*g^6*(a+b*x)^4) - (b^2*i^2*(c+d*x)^5*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(5*(b*c-a*d)^3*g^6*(a+b*x)^5)$

**Rubi [A]** time = 0.720867, antiderivative size = 375, normalized size of antiderivative = 1.28, number of steps used = 14, number of rules used = 4, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.093$ , Rules used = {2528, 2525, 12, 44}

$$\frac{d^2 i^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{3b^3 g^6 (a+bx)^3} - \frac{d i^2 (bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{2b^3 g^6 (a+bx)^4} - \frac{i^2 (bc-ad)^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{5b^3 g^6 (a+bx)^5} - \frac{\dots}{30b^3 g^6 (a+bx)^6}$$

Antiderivative was successfully verified.

[In] Int[((c\*i + d\*i\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(a\*g + b\*g\*x)^6,x]

[Out]  $-(B*(b*c-a*d)^2*i^2*n)/(25*b^3*g^6*(a+b*x)^5) - (3*B*d*(b*c-a*d)*i^2*n)/(40*b^3*g^6*(a+b*x)^4) - (B*d^2*i^2*n)/(90*b^3*g^6*(a+b*x)^3) + (B*d^3*i^2*n)/(60*b^3*(b*c-a*d)*g^6*(a+b*x)^2) - (B*d^4*i^2*n)/(30*b^3*(b*c-a*d)^2*g^6*(a+b*x)) - (B*d^5*i^2*n*Log[a+b*x])/(30*b^3*(b*c-a*d)^3*g^6) - (((b*c-a*d)^2*i^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(5*b^3*g^6*(a+b*x)^5) - (d*(b*c-a*d)*i^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(2*b^3*g^6*(a+b*x)^4) - (d^2*i^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(3*b^3*g^6*(a+b*x)^3) + (B*d^5*i^2*n*Log[c+d*x])/(30*b^3*(b*c-a*d)^3*g^6)$

Rule 2528

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{(126c + 126dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ag + bgx)^6} dx &= \int \left( \frac{15876(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2 g^6 (a + bx)^6} + \frac{31752d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2 g^6 (a + bx)^6} \right) dx \\
&= \frac{(15876d^2) \int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{(a+bx)^4} dx}{b^2 g^6} + \frac{(31752d(bc - ad)) \int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{(a+bx)^5} dx}{b^2 g^6} \\
&= -\frac{15876(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{5b^3 g^6 (a + bx)^5} - \frac{7938d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3 g^6 (a + bx)^5} \\
&= -\frac{15876(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{5b^3 g^6 (a + bx)^5} - \frac{7938d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3 g^6 (a + bx)^5} \\
&= -\frac{15876(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{5b^3 g^6 (a + bx)^5} - \frac{7938d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3 g^6 (a + bx)^5} \\
&= -\frac{15876B(bc - ad)^2 n}{25b^3 g^6 (a + bx)^5} - \frac{11907Bd(bc - ad)n}{10b^3 g^6 (a + bx)^4} - \frac{882Bd^2 n}{5b^3 g^6 (a + bx)^3} + \frac{7938d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3 g^6 (a + bx)^5}
\end{aligned}$$

**Mathematica [A]** time = 1.05588, size = 357, normalized size = 1.22

$$i^2 \left( -\frac{360a^2 Ad^2}{(a+bx)^5} - \frac{60B(a^2 d^2 + abd(3c+5dx) + b^2(6c^2 + 15cdx + 10d^2 x^2)) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{(a+bx)^5} - \frac{72a^2 Bd^2 n}{(a+bx)^5} - \frac{360Ab^2 c^2}{(a+bx)^5} - \frac{900Abcd}{(a+bx)^4} + \frac{720aAbcd}{(a+bx)^5} - \frac{600Ad^2}{(a+bx)^3} + \frac{7938d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3 g^6 (a + bx)^5} \right)$$

180

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(a\*g + b\*g\*x)^6, x]

[Out] (i^2\*((-360\*A\*b^2\*c^2)/(a + b\*x)^5 + (720\*a\*A\*b\*c\*d)/(a + b\*x)^5 - (360\*a^2\*A\*d^2)/(a + b\*x)^5 - (72\*b^2\*B\*c^2\*n)/(a + b\*x)^5 + (144\*a\*b\*B\*c\*d\*n)/(a + b\*x)^5 - (72\*a^2\*B\*d^2\*n)/(a + b\*x)^5 - (900\*A\*b\*c\*d)/(a + b\*x)^4 + (900\*a\*A\*d^2)/(a + b\*x)^4 - (135\*b\*B\*c\*d\*n)/(a + b\*x)^4 + (135\*a\*B\*d^2\*n)/(a + b\*x)^4 - (600\*A\*d^2)/(a + b\*x)^3 - (20\*B\*d^2\*n)/(a + b\*x)^3 + (30\*B\*d^3\*n)/((b\*c - a\*d)\*(a + b\*x)^2) - (60\*B\*d^4\*n)/((b\*c - a\*d)^2\*(a + b\*x)) - (60\*B\*d^5\*n\*Log[a + b\*x])/(b\*c - a\*d)^3 - (60\*B\*(a^2\*d^2 + a\*b\*d\*(3\*c + 5\*d\*x) + b^2\*d^3)/(a + b\*x)^5))

$2*(6*c^2 + 15*c*d*x + 10*d^2*x^2)*\text{Log}[e*((a + b*x)/(c + d*x))^n]/(a + b*x)^5 + (60*B*d^5*n*\text{Log}[c + d*x])/(b*c - a*d)^3)/(1800*b^3*g^6)$

**Maple [F]** time = 0.771, size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2}{(bgx + ag)^6} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^6,x)`

[Out] `int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^6,x)`

**Maxima [B]** time = 2.28833, size = 4128, normalized size = 14.09

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^6,x, algorithm="maxima")`

[Out] 
$$\begin{aligned} & -1/300*B*c^2*i^2*n*((60*b^4*d^4*x^4 + 12*b^4*c^4 - 63*a*b^3*c^3*d + 137*a^2*b^2*c^2*d^2 - 163*a^3*b*c*d^3 + 137*a^4*d^4 - 30*(b^4*c*d^3 - 9*a*b^3*d^4) \\ & *x^3 + 10*(2*b^4*c^2*d^2 - 13*a*b^3*c*d^3 + 47*a^2*b^2*d^4)*x^2 - 5*(3*b^4*c^3*d - 17*a*b^3*c^2*d^2 + 43*a^2*b^2*c*d^3 - 77*a^3*b*d^4)*x)/(b^{10}*c^4 - \\ & 4*a*b^9*c^3*d + 6*a^2*b^8*c^2*d^2 - 4*a^3*b^7*c*d^3 + a^4*b^6*d^4)*g^6*x^5 \\ & + 5*(a*b^9*c^4 - 4*a^2*b^8*c^3*d + 6*a^3*b^7*c^2*d^2 - 4*a^4*b^6*c*d^3 + a^5*b^5*d^4)*g^6*x^4 + 10*(a^2*b^8*c^4 - 4*a^3*b^7*c^3*d + 6*a^4*b^6*c^2*d^2 \\ & - 4*a^5*b^5*c*d^3 + a^6*b^4*d^4)*g^6*x^3 + 10*(a^3*b^7*c^4 - 4*a^4*b^6*c^3*d + 6*a^5*b^5*c^2*d^2 - 4*a^6*b^4*c*d^3 + a^7*b^3*d^4)*g^6*x^2 + 5*(a^4*b^6*c^4 \\ & - 4*a^5*b^5*c^3*d + 6*a^6*b^4*c^2*d^2 - 4*a^7*b^3*c*d^3 + a^8*b^2*d^4)*g^6*x + (a^5*b^5*c^4 - 4*a^6*b^4*c^3*d + 6*a^7*b^3*c^2*d^2 - 4*a^8*b^2*c*d^3 \\ & + a^9*b*d^4)*g^6 + 60*d^5*log(b*x + a)/((b^6*c^5 - 5*a*b^5*c^4*d + 10*a^2*b^4*c^3*d^2 - 10*a^3*b^3*c^2*d^3 + 5*a^4*b^2*c*d^4 - a^5*b*d^5)*g^6) - \\ & 60*d^5*log(d*x + c)/((b^6*c^5 - 5*a*b^5*c^4*d + 10*a^2*b^4*c^3*d^2 - 10*a^3*b^3*c^2*d^3 + 5*a^4*b^2*c*d^4 - a^5*b*d^5)*g^6) - 1/1800*B*d^2*i^2*n*((47 \\ & *a^2*b^4*c^4 - 278*a^3*b^3*c^3*d + 822*a^4*b^2*c^2*d^2 - 278*a^5*b*c*d^3 + \end{aligned}$$

$$\begin{aligned}
& 47a^6d^4 + 60(10b^6c^2d^2 - 5a^5b^5cd^3 + a^2b^4d^4)x^4 - 30(10 \\
& *b^6c^3d - 95a^5b^5c^2d^2 + 46a^2b^4cd^3 - 9a^3b^3d^4)x^3 + 10* \\
& (20b^6c^4 - 140a^5b^5c^3d + 537a^2b^4c^2d^2 - 248a^3b^3cd^3 + 4 \\
& 7a^4b^2d^4)x^2 + 5(35a^5b^5c^4 - 218a^2b^4c^3d + 702a^3b^3c^2d \\
& ^2 - 278a^4b^2cd^3 + 47a^5b^2d^4)x)/((b^{12}c^4 - 4a^5b^{11}c^3d + 6* \\
& a^2b^{10}c^2d^2 - 4a^3b^9cd^3 + a^4b^8d^4)g^6x^5 + 5(a^5b^{11}c^4 - \\
& 4a^2b^{10}c^3d + 6a^3b^9c^2d^2 - 4a^4b^8cd^3 + a^5b^7d^4)g^6* \\
& x^4 + 10(a^2b^{10}c^4 - 4a^3b^9c^3d + 6a^4b^8c^2d^2 - 4a^5b^7c^2 \\
& d^3 + a^6b^6d^4)g^6x^3 + 10(a^3b^9c^4 - 4a^4b^8c^3d + 6a^5b^7c \\
& ^2d^2 - 4a^6b^6cd^3 + a^7b^5d^4)g^6x^2 + 5(a^4b^8c^4 - 4a^5b^7 \\
& ^7c^3d + 6a^6b^6c^2d^2 - 4a^7b^5cd^3 + a^8b^4d^4)g^6x + (a^5b^ \\
& ^7c^4 - 4a^6b^6c^3d + 6a^7b^5c^2d^2 - 4a^8b^4cd^3 + a^9b^3d^ \\
& ^4)g^6) + 60(10b^2c^2d^3 - 5a^5b^5cd^4 + a^2d^5)\log(bx + a)/((b^8c^ \\
& ^5 - 5a^5b^7c^4d + 10a^2b^6c^3d^2 - 10a^3b^5c^2d^3 + 5a^4b^4cd \\
& ^4 - a^5b^3d^5)g^6) - 60(10b^2c^2d^3 - 5a^5b^5cd^4 + a^2d^5)\log(d \\
& *x + c)/((b^8c^5 - 5a^5b^7c^4d + 10a^2b^6c^3d^2 - 10a^3b^5c^2d^3 \\
& + 5a^4b^4cd^4 - a^5b^3d^5)g^6)) - 1/600B^5c^2d^2i^2n*((27a^5b^4c^4 \\
& - 148a^2b^3c^3d + 352a^3b^2c^2d^2 - 548a^4b^2cd^3 + 77a^5d^4 - \\
& 60(5b^5cd^3 - ab^4d^4)x^4 + 30(5b^5c^2d^2 - 46a^5b^4cd^3 + 9a^ \\
& ^2b^3d^4)x^3 - 10(10b^5c^3d - 67a^5b^4c^2d^2 + 248a^2b^3cd^3 - \\
& 47a^3b^2d^4)x^2 + 5(15b^5c^4 - 88a^5b^4c^3d + 232a^2b^3c^2d^2 \\
& - 428a^3b^2cd^3 + 77a^4b^2d^4)x)/((b^{11}c^4 - 4a^5b^{10}c^3d + 6a^2 \\
& ^5b^9c^2d^2 - 4a^3b^8cd^3 + a^4b^7d^4)g^6x^5 + 5(a^5b^{10}c^4 - 4a^ \\
& ^2b^9c^3d + 6a^3b^8c^2d^2 - 4a^4b^7cd^3 + a^5b^6d^4)g^6x^4 + \\
& 10(a^2b^9c^4 - 4a^3b^8c^3d + 6a^4b^7c^2d^2 - 4a^5b^6cd^3 + \\
& a^6b^5d^4)g^6x^3 + 10(a^3b^8c^4 - 4a^4b^7c^3d + 6a^5b^6c^2d^ \\
& ^2 - 4a^6b^5cd^3 + a^7b^4d^4)g^6x^2 + 5(a^4b^7c^4 - 4a^5b^6c^3 \\
& *d + 6a^6b^5c^2d^2 - 4a^7b^4cd^3 + a^8b^3d^4)g^6x + (a^5b^6c^ \\
& ^4 - 4a^6b^5c^3d + 6a^7b^4c^2d^2 - 4a^8b^3cd^3 + a^9b^2d^4)g^ \\
& ^6) - 60(5b^5cd^4 - ad^5)\log(bx + a)/((b^7c^5 - 5a^5b^6c^4d + 10a^2 \\
& ^5b^5c^3d^2 - 10a^3b^4c^2d^3 + 5a^4b^3cd^4 - a^5b^2d^5)g^6) + 6 \\
& 0(5b^5cd^4 - ad^5)\log(dx + c)/((b^7c^5 - 5a^5b^6c^4d + 10a^2b^5c^ \\
& ^3d^2 - 10a^3b^4c^2d^3 + 5a^4b^3cd^4 - a^5b^2d^5)g^6)) - 1/10*( \\
& 5b^5x + a)B^5c^2d^2i^2\log(e*(bx/(dx + c) + a/(dx + c))^n)/(b^7g^6x^5 + \\
& 5a^5b^6g^6x^4 + 10a^2b^5g^6x^3 + 10a^3b^4g^6x^2 + 5a^4b^3g^6x \\
& + a^5b^2g^6) - 1/30(10b^2x^2 + 5a^5b^5x + a^2)B^5d^2i^2\log(e*(bx/(d \\
& *x + c) + a/(dx + c))^n)/(b^8g^6x^5 + 5a^5b^7g^6x^4 + 10a^2b^6g^6x \\
& ^3 + 10a^3b^5g^6x^2 + 5a^4b^4g^6x + a^5b^3g^6) - 1/10(5b^5x + a) \\
& *A^5c^2d^2i^2/(b^7g^6x^5 + 5a^5b^6g^6x^4 + 10a^2b^5g^6x^3 + 10a^3b^4 \\
& ^5g^6x^2 + 5a^4b^3g^6x + a^5b^2g^6) - 1/30(10b^2x^2 + 5a^5b^5x + a^ \\
& ^2)*A^5d^2i^2/(b^8g^6x^5 + 5a^5b^7g^6x^4 + 10a^2b^6g^6x^3 + 10a^3b^ \\
& ^5g^6x^2 + 5a^4b^4g^6x + a^5b^3g^6) - 1/5B^5c^2i^2\log(e*(bx/(dx \\
& + c) + a/(dx + c))^n)/(b^6g^6x^5 + 5a^5b^5g^6x^4 + 10a^2b^4g^6x^3 \\
& + 10a^3b^3g^6x^2 + 5a^4b^2g^6x + a^5b^2g^6) - 1/5A^5c^2i^2/(b^6g^ \\
& ^6x^5 + 5a^5b^5g^6x^4 + 10a^2b^4g^6x^3 + 10a^3b^3g^6x^2 + 5a^4b^2
\end{aligned}$$

$$b^2 * g^6 * x + a^5 * b * g^6)$$

**Fricas [B]** time = 0.634855, size = 2213, normalized size = 7.55

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^6,x, algorithm="fricas")

[Out] 
$$\begin{aligned} & -1/1800*(60*(B*b^5*c*d^4 - B*a*b^4*d^5)*i^2*n*x^4 - 30*(B*b^5*c^2*d^3 - 10* \\ & B*a*b^4*c*d^4 + 9*B*a^2*b^3*d^5)*i^2*n*x^3 + (72*B*b^5*c^5 - 225*B*a*b^4*c^4*d \\ & + 200*B*a^2*b^3*c^3*d^2 - 47*B*a^5*d^5)*i^2*n + 60*(6*A*b^5*c^5 - 15*A* \\ & a*b^4*c^4*d + 10*A*a^2*b^3*c^3*d^2 - A*a^5*d^5)*i^2 + 10*((2*B*b^5*c^3*d^2 \\ & - 15*B*a*b^4*c^2*d^3 + 60*B*a^2*b^3*c*d^4 - 47*B*a^3*b^2*d^5)*i^2*n + 60*(A \\ & *b^5*c^3*d^2 - 3*A*a*b^4*c^2*d^3 + 3*A*a^2*b^3*c*d^4 - A*a^3*b^2*d^5)*i^2)* \\ & x^2 + 5*((27*B*b^5*c^4*d - 100*B*a*b^4*c^3*d^2 + 120*B*a^2*b^3*c^2*d^3 - 47 \\ & *B*a^4*b*d^5)*i^2*n + 60*(3*A*b^5*c^4*d - 8*A*a*b^4*c^3*d^2 + 6*A*a^2*b^3*c \\ & ^2*d^3 - A*a^4*b*d^5)*i^2)*x + 60*(10*(B*b^5*c^3*d^2 - 3*B*a*b^4*c^2*d^3 + \\ & 3*B*a^2*b^3*c*d^4 - B*a^3*b^2*d^5)*i^2*x^2 + 5*(3*B*b^5*c^4*d - 8*B*a*b^4*c \\ & ^3*d^2 + 6*B*a^2*b^3*c^2*d^3 - B*a^4*b*d^5)*i^2*x + (6*B*b^5*c^5 - 15*B*a*b \\ & ^4*c^4*d + 10*B*a^2*b^3*c^3*d^2 - B*a^5*d^5)*i^2)*\log(e) + 60*(B*b^5*d^5*i^2 \\ & *n*x^5 + 5*B*a*b^4*d^5*i^2*n*x^4 + 10*B*a^2*b^3*d^5*i^2*n*x^3 + 10*(B*b^5*c \\ & ^3*d^2 - 3*B*a*b^4*c^2*d^3 + 3*B*a^2*b^3*c*d^4)*i^2*n*x^2 + 5*(3*B*b^5*c^4 \\ & *d - 8*B*a*b^4*c^3*d^2 + 6*B*a^2*b^3*c^2*d^3)*i^2*n*x + (6*B*b^5*c^5 - 15*B \\ & *a*b^4*c^4*d + 10*B*a^2*b^3*c^3*d^2)*i^2*n)*\log((b*x + a)/(d*x + c)))/((b^1 \\ & 1*c^3 - 3*a*b^10*c^2*d + 3*a^2*b^9*c*d^2 - a^3*b^8*d^3)*g^6*x^5 + 5*(a*b^10 \\ & *c^3 - 3*a^2*b^9*c^2*d + 3*a^3*b^8*c*d^2 - a^4*b^7*d^3)*g^6*x^4 + 10*(a^2*b \\ & ^9*c^3 - 3*a^3*b^8*c^2*d + 3*a^4*b^7*c*d^2 - a^5*b^6*d^3)*g^6*x^3 + 10*(a^3 \\ & *b^8*c^3 - 3*a^4*b^7*c^2*d + 3*a^5*b^6*c*d^2 - a^6*b^5*d^3)*g^6*x^2 + 5*(a^4 \\ & *b^7*c^3 - 3*a^5*b^6*c^2*d + 3*a^6*b^5*c*d^2 - a^7*b^4*d^3)*g^6*x + (a^5*b \\ & ^6*c^3 - 3*a^6*b^5*c^2*d + 3*a^7*b^4*c*d^2 - a^8*b^3*d^3)*g^6) \end{aligned}$$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**6,x)
```

```
[Out] Timed out
```

**Giac [B]** time = 1.33954, size = 1443, normalized size = 4.92

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^6,x, algorithm="giac")
```

```
[Out] 1/30*B*d^5*n*log(b*x + a)/(b^6*c^3*g^6 - 3*a*b^5*c^2*d*g^6 + 3*a^2*b^4*c*d^2*g^6 - a^3*b^3*d^3*g^6) - 1/30*B*d^5*n*log(d*x + c)/(b^6*c^3*g^6 - 3*a*b^5*c^2*d*g^6 + 3*a^2*b^4*c*d^2*g^6 - a^3*b^3*d^3*g^6) + 1/30*(10*B*b^2*d^2*n*x^2 + 15*B*b^2*c*d*n*x + 5*B*a*b*d^2*n*x + 6*B*b^2*c^2*n + 3*B*a*b*c*d*n + B*a^2*d^2*n)*log((b*x + a)/(d*x + c))/(b^8*g^6*x^5 + 5*a*b^7*g^6*x^4 + 10*a^2*b^6*g^6*x^3 + 10*a^3*b^5*g^6*x^2 + 5*a^4*b^4*g^6*x + a^5*b^3*g^6) + 1/1800*(60*B*b^4*d^4*n*x^4 - 30*B*b^4*c*d^3*n*x^3 + 270*B*a*b^3*d^4*n*x^3 + 20*B*b^4*c^2*d^2*n*x^2 - 130*B*a*b^3*c*d^3*n*x^2 + 470*B*a^2*b^2*d^4*n*x^2 + 135*B*b^4*c^3*d*n*x - 365*B*a*b^3*c^2*d^2*n*x + 235*B*a^2*b^2*c*d^3*n*x + 235*B*a^3*b*d^4*n*x + 600*A*b^4*c^2*d^2*x^2 + 600*B*b^4*c^2*d^2*x^2 - 1200*A*a*b^3*c*d^3*x^2 - 1200*B*a*b^3*c*d^3*x^2 + 600*A*a^2*b^2*d^4*x^2 + 600*B*a^2*b^2*d^4*x^2 + 72*B*b^4*c^4*n - 153*B*a*b^3*c^3*d*n + 47*B*a^2*b^2*c^2*d^2*n + 47*B*a^3*b*c*d^3*n + 47*B*a^4*d^4*n + 900*A*b^4*c^3*d*x + 900*B*b^4*c^3*d*x - 1500*A*a*b^3*c^2*d^2*x - 1500*B*a*b^3*c^2*d^2*x + 300*A*a^2*b^2*c*d^3*x + 300*B*a^2*b^2*c*d^3*x + 300*A*a^3*b*d^4*x + 300*B*a^3*b*d^4*x + 360*A*b^4*c^4 + 360*B*b^4*c^4 - 540*A*a*b^3*c^3*d - 540*B*a*b^3*c^3*d + 60*A*a^2*b^2*c^2*d^2 + 60*B*a^2*b^2*c^2*d^2 + 60*A*a^3*b*c*d^3 + 60*B*a^3*b*c*d^3 + 60*A*a^4*d^4 + 60*B*a^4*d^4)/(b^10*c^2*g^6*x^5 - 2*a*b^9*c*d*g^6*x^5 + a^2*b^8*d^2*g^6*x^5 + 5*a*b^9*c^2*g^6*x^4 - 10*a^2*b^8*c*d*g^6*x^4 + 5*a^3*b^7*d^2*g^6*x^4 + 10*a^2*b^8*c^2*g^6*x^3 - 20*a^3*b^7*c*d*g^6*x^3 + 10*a^4*b^6*d^2*g^6*x^3 + 10*a^3*b^7*c^2*g^6*x^2 - 20*a^4*b^6*c*d*g^6*x^2 + 10*a^5*b^5*d^2*g^6*x^2 + 5*a^4*b^6*c^2*g^6*x - 10*a^5*b^5*c*d*g^6*x + 5*a^6*b^4*d^2*g^6*x + a^5*b^5*c^2*g^6 - 2*a^6*b^4*c*d*g^6 + a^7*b^3*d^2*g^6)
```

$$3.127 \quad \int (ag+bgx)^3 (ci+dix)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx$$

**Optimal.** Leaf size=477

$$\frac{b^2 g^3 i^3 (c+dx)^6 (bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{2d^4} + \frac{b^3 g^3 i^3 (c+dx)^7 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{7d^4} - \frac{g^3 i^3 (c+dx)^4 (bc-ad)^3 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{4d^4}$$

[Out] (B\*(b\*c - a\*d)^6\*g^3\*i^3\*n\*x)/(140\*b^3\*d^3) + (B\*(b\*c - a\*d)^5\*g^3\*i^3\*n\*(c + d\*x)^2)/(280\*b^2\*d^4) + (B\*(b\*c - a\*d)^4\*g^3\*i^3\*n\*(c + d\*x)^3)/(420\*b\*d^4) - (17\*B\*(b\*c - a\*d)^3\*g^3\*i^3\*n\*(c + d\*x)^4)/(280\*d^4) + (b\*B\*(b\*c - a\*d)^2\*g^3\*i^3\*n\*(c + d\*x)^5)/(14\*d^4) - (b^2\*B\*(b\*c - a\*d)\*g^3\*i^3\*n\*(c + d\*x)^6)/(42\*d^4) - ((b\*c - a\*d)^3\*g^3\*i^3\*(c + d\*x)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(4\*d^4) + (3\*b\*(b\*c - a\*d)^2\*g^3\*i^3\*(c + d\*x)^5\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(5\*d^4) - (b^2\*(b\*c - a\*d)\*g^3\*i^3\*(c + d\*x)^6\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(2\*d^4) + (b^3\*g^3\*i^3\*(c + d\*x)^7\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(7\*d^4) + (B\*(b\*c - a\*d)^7\*g^3\*i^3\*n\*Log[(a + b\*x)/(c + d\*x)])/(140\*b^4\*d^4) + (B\*(b\*c - a\*d)^7\*g^3\*i^3\*n\*Log[c + d\*x])/(140\*b^4\*d^4)

**Rubi [A]** time = 0.991502, antiderivative size = 435, normalized size of antiderivative = 0.91, number of steps used = 18, number of rules used = 4, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.093$ , Rules used = {2528, 2525, 12, 43}

$$\frac{d^2 g^3 i^3 (a+bx)^6 (bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{2b^4} + \frac{d^3 g^3 i^3 (a+bx)^7 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{7b^4} + \frac{g^3 i^3 (a+bx)^4 (bc-ad)^3 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{4b^4}$$

Antiderivative was successfully verified.

[In] Int[(a\*g + b\*g\*x)^3\*(c\*i + d\*i\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]), x]

[Out] -(B\*(b\*c - a\*d)^6\*g^3\*i^3\*n\*x)/(140\*b^3\*d^3) + (B\*(b\*c - a\*d)^5\*g^3\*i^3\*n\*(a + b\*x)^2)/(280\*b^4\*d^2) - (B\*(b\*c - a\*d)^4\*g^3\*i^3\*n\*(a + b\*x)^3)/(420\*b^4\*d) - (17\*B\*(b\*c - a\*d)^3\*g^3\*i^3\*n\*(a + b\*x)^4)/(280\*b^4) - (B\*d\*(b\*c - a\*d)^2\*g^3\*i^3\*n\*(a + b\*x)^5)/(14\*b^4) - (B\*d^2\*(b\*c - a\*d)\*g^3\*i^3\*n\*(a + b\*x)^6)/(42\*b^4) + ((b\*c - a\*d)^3\*g^3\*i^3\*(a + b\*x)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(4\*b^4) + (3\*d\*(b\*c - a\*d)^2\*g^3\*i^3\*(a + b\*x)^5\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(5\*b^4) + (d^2\*(b\*c - a\*d)\*g^3\*i^3\*(a + b\*x)^6\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(2\*b^4) + (d^3\*g^3\*i^3\*(a + b\*x)^7\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(7\*b^4) + (B\*(b\*c - a\*d)^7\*g^3\*i^3\*n\*Log[(a + b\*x)/(c + d\*x)])/(140\*b^4\*d^4) + (B\*(b\*c - a\*d)^7\*g^3\*i^3\*n\*Log[a + b\*x])/(140\*b^4\*d^4)



$$\int \frac{(A + B \log[e * ((a + b * x) / (c + d * x))^n]) / (7 * b^4) + (B * (b * c - a * d)^7 * g^3 * i^{3 * n} * \log[c + d * x]) / (140 * b^4 * d^4)}{dx}$$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[(((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && LeQ[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

### Rubi steps

$$\begin{aligned}
\int (127c + 127dx)^3 (ag + bgx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx &= \int \left( \frac{(-bc + ad)^3 g^3 (127c + 127dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{d^3} \right) dx \\
&= \frac{(b^3 g^3) \int (127c + 127dx)^6 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx}{2048383 d^3} \\
&= -\frac{2048383 (bc - ad)^3 g^3 (c + dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{4 d^4} \\
&= -\frac{2048383 (bc - ad)^3 g^3 (c + dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{4 d^4} \\
&= -\frac{2048383 (bc - ad)^3 g^3 (c + dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{4 d^4} \\
&= \frac{2048383 B (bc - ad)^6 g^3 n x}{140 b^3 d^3} + \frac{2048383 B (bc - ad)^5 g^3 n (c + a)}{280 b^2 d^4}
\end{aligned}$$

**Mathematica [A]** time = 0.587502, size = 631, normalized size = 1.32

$$g^3 i^3 \left( 120 d^7 (a + bx)^7 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right) + 420 d^6 (a + bx)^6 (bc - ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right) + 504 d^5 (a + bx)^5 (bc - ad) \right)$$

Antiderivative was successfully verified.

[In] Integrate[(a\*g + b\*g\*x)^3\*(c\*i + d\*i\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]),x]

[Out] (g^3\*i^3\*(210\*d^4\*(b\*c - a\*d)^3\*(a + b\*x)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 504\*d^5\*(b\*c - a\*d)^2\*(a + b\*x)^5\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 420\*d^6\*(b\*c - a\*d)\*(a + b\*x)^6\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 120\*d^7\*(a + b\*x)^7\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 35\*B\*(b\*c - a\*d)^4\*n\*(6\*b\*d\*(b\*c - a\*d)^2\*x + 3\*d^2\*(-(b\*c) + a\*d)\*(a + b\*x)^2 + 2\*d^3\*(a + b\*x)^3 - 6\*(b\*c - a\*d)^3\*Log[c + d\*x]) + 42\*B\*(b\*c - a\*d)^3\*n\*(12\*b\*d\*(b\*c - a\*d)^3\*x - 6\*d^2\*(b\*c - a\*d)^2\*(a + b\*x)^2 + 4\*d^3\*(b\*c - a\*d)\*(a + b\*x)^3 - 3\*d^4\*(a + b\*x)^4 - 12\*(b\*c - a\*d)^4\*Log[c + d\*x]) - 7\*B\*(b\*c - a\*d)^2\*n\*(60\*b\*d\*(b\*c - a\*d)^4\*x + 30\*d^2\*(-(b\*c) + a\*d)^3\*(a + b\*x)^2 + 20\*d^3\*(b\*c - a\*d)^2\*(a + b\*x)^3 + 15\*d^4\*(-(b\*c) + a\*d)\*(a + b\*x)^4 + 12

```
*d^5*(a + b*x)^5 - 60*(b*c - a*d)^5*Log[c + d*x]) + 2*B*(b*c - a*d)*n*(60*b
*d*(b*c - a*d)^5*x - 30*d^2*(b*c - a*d)^4*(a + b*x)^2 + 20*d^3*(b*c - a*d)^
3*(a + b*x)^3 - 15*d^4*(b*c - a*d)^2*(a + b*x)^4 + 12*d^5*(b*c - a*d)*(a +
b*x)^5 - 10*d^6*(a + b*x)^6 - 60*(b*c - a*d)^6*Log[c + d*x]))/(840*b^4*d^4
)
```

**Maple [F]** time = 0.678, size = 0, normalized size = 0.

$$\int (bgx + ag)^3 (dix + ci)^3 \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

**Maxima [B]** time = 1.60214, size = 3916, normalized size = 8.21

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, a
lgorithm="maxima")
```

```
[Out] 1/7*B*b^3*d^3*g^3*i^3*x^7*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/7*A*b^
3*d^3*g^3*i^3*x^7 + 1/2*B*b^3*c*d^2*g^3*i^3*x^6*log(e*(b*x/(d*x + c) + a/(d
*x + c))^n) + 1/2*B*a*b^2*d^3*g^3*i^3*x^6*log(e*(b*x/(d*x + c) + a/(d*x + c
))^n) + 1/2*A*b^3*c*d^2*g^3*i^3*x^6 + 1/2*A*a*b^2*d^3*g^3*i^3*x^6 + 3/5*B*b
^3*c^2*d*g^3*i^3*x^5*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 9/5*B*a*b^2*c
*d^2*g^3*i^3*x^5*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/5*B*a^2*b*d^3*g
^3*i^3*x^5*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/5*A*b^3*c^2*d*g^3*i^3
*x^5 + 9/5*A*a*b^2*c*d^2*g^3*i^3*x^5 + 3/5*A*a^2*b*d^3*g^3*i^3*x^5 + 1/4*B*
b^3*c^3*g^3*i^3*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 9/4*B*a*b^2*c^
2*d*g^3*i^3*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 9/4*B*a^2*b*c*d^2*
g^3*i^3*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/4*B*a^3*d^3*g^3*i^3*
x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/4*A*b^3*c^3*g^3*i^3*x^4 + 9/
4*A*a*b^2*c^2*d*g^3*i^3*x^4 + 9/4*A*a^2*b*c*d^2*g^3*i^3*x^4 + 1/4*A*a^3*d^3
```

$$\begin{aligned}
& *g^3i^3x^4 + B*a*b^2*c^3*g^3i^3x^3*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3*B*a^2*b*c^2*d*g^3i^3x^3*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + B \\
& *a^3*c*d^2*g^3i^3x^3*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*a*b^2*c^3 \\
& *g^3i^3x^3 + 3*A*a^2*b*c^2*d*g^3i^3x^3 + A*a^3*c*d^2*g^3i^3x^3 + 3/2* \\
& B*a^2*b*c^3*g^3i^3x^2*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/2*B*a^3* \\
& c^2*d*g^3i^3x^2*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/2*A*a^2*b*c^3* \\
& g^3i^3x^2 + 3/2*A*a^3*c^2*d*g^3i^3x^2 + 1/420*B*b^3*d^3*g^3i^3n*(60*a \\
& ^7*\log(b*x + a)/b^7 - 60*c^7*\log(d*x + c)/d^7 - (10*(b^6*c*d^5 - a*b^5*d^6) \\
& *x^6 - 12*(b^6*c^2*d^4 - a^2*b^4*d^6)*x^5 + 15*(b^6*c^3*d^3 - a^3*b^3*d^6)* \\
& x^4 - 20*(b^6*c^4*d^2 - a^4*b^2*d^6)*x^3 + 30*(b^6*c^5*d - a^5*b*d^6)*x^2 - \\
& 60*(b^6*c^6 - a^6*d^6)*x)/(b^6*d^6) - 1/120*B*b^3*c*d^2*g^3i^3n*(60*a^6 \\
& *\log(b*x + a)/b^6 - 60*c^6*\log(d*x + c)/d^6 + (12*(b^5*c*d^4 - a*b^4*d^5)*x \\
& ^5 - 15*(b^5*c^2*d^3 - a^2*b^3*d^5)*x^4 + 20*(b^5*c^3*d^2 - a^3*b^2*d^5)*x^3 \\
& - 30*(b^5*c^4*d - a^4*b*d^5)*x^2 + 60*(b^5*c^5 - a^5*d^5)*x)/(b^5*d^5) - \\
& 1/120*B*a*b^2*d^3*g^3i^3n*(60*a^6*\log(b*x + a)/b^6 - 60*c^6*\log(d*x + c) \\
& /d^6 + (12*(b^5*c*d^4 - a*b^4*d^5)*x^5 - 15*(b^5*c^2*d^3 - a^2*b^3*d^5)*x^4 \\
& + 20*(b^5*c^3*d^2 - a^3*b^2*d^5)*x^3 - 30*(b^5*c^4*d - a^4*b*d^5)*x^2 + 60 \\
& *(b^5*c^5 - a^5*d^5)*x)/(b^5*d^5) + 1/20*B*b^3*c^2*d*g^3i^3n*(12*a^5*\log \\
& (b*x + a)/b^5 - 12*c^5*\log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - \\
& 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4 \\
& *c^4 - a^4*d^4)*x)/(b^4*d^4) + 3/20*B*a*b^2*c*d^2*g^3i^3n*(12*a^5*\log(b* \\
& x + a)/b^5 - 12*c^5*\log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*( \\
& b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 \\
& - a^4*d^4)*x)/(b^4*d^4) + 1/20*B*a^2*b*d^3*g^3i^3n*(12*a^5*\log(b*x + a) \\
& )/b^5 - 12*c^5*\log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c \\
& ^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a \\
& ^4*d^4)*x)/(b^4*d^4) - 1/24*B*b^3*c^3*g^3i^3n*(6*a^4*\log(b*x + a)/b^4 - \\
& 6*c^4*\log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^ \\
& 2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3) - 3/8*B*a*b^2*c^2*d*g^3i \\
& ^3n*(6*a^4*\log(b*x + a)/b^4 - 6*c^4*\log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a* \\
& b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^ \\
& 3*d^3) - 3/8*B*a^2*b*c*d^2*g^3i^3n*(6*a^4*\log(b*x + a)/b^4 - 6*c^4*\log(d \\
& *x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^ \\
& 2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3) - 1/24*B*a^3*d^3*g^3i^3n*(6*a^4*1 \\
& \log(b*x + a)/b^4 - 6*c^4*\log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - \\
& 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3) + 1/2* \\
& B*a*b^2*c^3*g^3i^3n*(2*a^3*\log(b*x + a)/b^3 - 2*c^3*\log(d*x + c)/d^3 - (( \\
& b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2) + 3/2*B*a^2*b* \\
& c^2*d*g^3i^3n*(2*a^3*\log(b*x + a)/b^3 - 2*c^3*\log(d*x + c)/d^3 - ((b^2*c* \\
& d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2) + 1/2*B*a^3*c*d^2*g^ \\
& 3i^3n*(2*a^3*\log(b*x + a)/b^3 - 2*c^3*\log(d*x + c)/d^3 - ((b^2*c*d - a*b* \\
& d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2) - 3/2*B*a^2*b*c^3*g^3i^3n* \\
& (a^2*\log(b*x + a)/b^2 - c^2*\log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) - 3/2*B \\
& *a^3*c^2*d*g^3i^3n*(a^2*\log(b*x + a)/b^2 - c^2*\log(d*x + c)/d^2 + (b*c - \\
& a*d)*x/(b*d)) + B*a^3*c^3*g^3i^3n*(a*\log(b*x + a)/b - c*\log(d*x + c)/d) +
\end{aligned}$$

$$B*a^3*c^3*g^3*i^3*x*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*a^3*c^3*g^3*i^3*x$$

**Fricas [B]** time = 1.83033, size = 2716, normalized size = 5.69

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(d\*i\*x+c\*i)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n)),x, algorithm="fricas")

[Out] 
$$\frac{1}{840} \cdot (120 \cdot A \cdot b^7 \cdot d^7 \cdot g^3 \cdot i^3 \cdot x^7 + 6 \cdot (35 \cdot B \cdot a^4 \cdot b^3 \cdot c^3 \cdot d^4 - 21 \cdot B \cdot a^5 \cdot b^2 \cdot c^2 \cdot d^5 + 7 \cdot B \cdot a^6 \cdot b \cdot c \cdot d^6 - B \cdot a^7 \cdot d^7) \cdot g^3 \cdot i^3 \cdot n \cdot \log(b \cdot x + a) + 6 \cdot (B \cdot b^7 \cdot c^7 - 7 \cdot B \cdot a \cdot b^6 \cdot c^6 \cdot d + 21 \cdot B \cdot a^2 \cdot b^5 \cdot c^5 \cdot d^2 - 35 \cdot B \cdot a^3 \cdot b^4 \cdot c^4 \cdot d^3) \cdot g^3 \cdot i^3 \cdot n \cdot \log(d \cdot x + c) - 20 \cdot ((B \cdot b^7 \cdot c \cdot d^6 - B \cdot a \cdot b^6 \cdot d^7) \cdot g^3 \cdot i^3 \cdot n - 21 \cdot (A \cdot b^7 \cdot c \cdot d^6 + A \cdot a \cdot b^6 \cdot d^7) \cdot g^3 \cdot i^3) \cdot x^6 - 12 \cdot (5 \cdot (B \cdot b^7 \cdot c^2 \cdot d^5 - B \cdot a^2 \cdot b^5 \cdot d^7) \cdot g^3 \cdot i^3 \cdot n - 42 \cdot (A \cdot b^7 \cdot c^2 \cdot d^5 + 3 \cdot A \cdot a \cdot b^6 \cdot c \cdot d^6 + A \cdot a^2 \cdot b^5 \cdot d^7) \cdot g^3 \cdot i^3) \cdot x^5 - 3 \cdot ((17 \cdot B \cdot b^7 \cdot c^3 \cdot d^4 + 49 \cdot B \cdot a \cdot b^6 \cdot c^2 \cdot d^5 - 49 \cdot B \cdot a^2 \cdot b^5 \cdot c \cdot d^6 - 17 \cdot B \cdot a^3 \cdot b^4 \cdot d^7) \cdot g^3 \cdot i^3 \cdot n - 70 \cdot (A \cdot b^7 \cdot c^3 \cdot d^4 + 9 \cdot A \cdot a \cdot b^6 \cdot c^2 \cdot d^5 + 9 \cdot A \cdot a^2 \cdot b^5 \cdot c \cdot d^6 + A \cdot a^3 \cdot b^4 \cdot d^7) \cdot g^3 \cdot i^3) \cdot x^4 - 2 \cdot ((B \cdot b^7 \cdot c^4 \cdot d^3 + 98 \cdot B \cdot a \cdot b^6 \cdot c^3 \cdot d^4 - 98 \cdot B \cdot a^2 \cdot b^5 \cdot c^2 \cdot d^5 + 3 \cdot A \cdot a^2 \cdot b^5 \cdot c^2 \cdot d^5 + A \cdot a^3 \cdot b^4 \cdot c \cdot d^6) \cdot g^3 \cdot i^3) \cdot x^3 + 3 \cdot ((B \cdot b^7 \cdot c^5 \cdot d^2 - 7 \cdot B \cdot a \cdot b^6 \cdot c^4 \cdot d^3 - 84 \cdot B \cdot a^2 \cdot b^5 \cdot c^3 \cdot d^4 + 84 \cdot B \cdot a^3 \cdot b^4 \cdot c^2 \cdot d^5 + 7 \cdot B \cdot a^4 \cdot b^3 \cdot c \cdot d^6 - B \cdot a^5 \cdot b^2 \cdot d^7) \cdot g^3 \cdot i^3 \cdot n + 420 \cdot (A \cdot a^2 \cdot b^5 \cdot c^3 \cdot d^4 + A \cdot a^3 \cdot b^4 \cdot c^2 \cdot d^5) \cdot g^3 \cdot i^3) \cdot x^2 + 6 \cdot (140 \cdot A \cdot a^3 \cdot b^4 \cdot c^3 \cdot d^4 \cdot g^3 \cdot i^3 - (B \cdot b^7 \cdot c^6 \cdot d - 7 \cdot B \cdot a \cdot b^6 \cdot c^5 \cdot d^2 + 21 \cdot B \cdot a^2 \cdot b^5 \cdot c^4 \cdot d^3 - 21 \cdot B \cdot a^4 \cdot b^3 \cdot c^2 \cdot d^5 + 7 \cdot B \cdot a^5 \cdot b^2 \cdot c \cdot d^6 - B \cdot a^6 \cdot b \cdot d^7) \cdot g^3 \cdot i^3 \cdot n) \cdot x + 6 \cdot (20 \cdot B \cdot b^7 \cdot d^7 \cdot g^3 \cdot i^3 \cdot x^7 + 140 \cdot B \cdot a^3 \cdot b^4 \cdot c^3 \cdot d^4 \cdot g^3 \cdot i^3 \cdot x + 70 \cdot (B \cdot b^7 \cdot c \cdot d^6 + B \cdot a \cdot b^6 \cdot d^7) \cdot g^3 \cdot i^3 \cdot x^6 + 84 \cdot (B \cdot b^7 \cdot c^2 \cdot d^5 + 3 \cdot B \cdot a \cdot b^6 \cdot c \cdot d^6 + B \cdot a^2 \cdot b^5 \cdot d^7) \cdot g^3 \cdot i^3 \cdot x^5 + 35 \cdot (B \cdot b^7 \cdot c^3 \cdot d^4 + 9 \cdot B \cdot a \cdot b^6 \cdot c^2 \cdot d^5 + 9 \cdot B \cdot a^2 \cdot b^5 \cdot c \cdot d^6 + B \cdot a^3 \cdot b^4 \cdot d^7) \cdot g^3 \cdot i^3 \cdot x^4 + 140 \cdot (B \cdot a \cdot b^6 \cdot c^3 \cdot d^4 + 3 \cdot B \cdot a^2 \cdot b^5 \cdot c^2 \cdot d^5 + B \cdot a^3 \cdot b^4 \cdot c \cdot d^6) \cdot g^3 \cdot i^3 \cdot x^3 + 210 \cdot (B \cdot a^2 \cdot b^5 \cdot c^3 \cdot d^4 + B \cdot a^3 \cdot b^4 \cdot c^2 \cdot d^5) \cdot g^3 \cdot i^3 \cdot x^2) \cdot \log(e) + 6 \cdot (20 \cdot B \cdot b^7 \cdot d^7 \cdot g^3 \cdot i^3 \cdot n \cdot x^7 + 140 \cdot B \cdot a^3 \cdot b^4 \cdot c^3 \cdot d^4 \cdot g^3 \cdot i^3 \cdot n \cdot x + 70 \cdot (B \cdot b^7 \cdot c \cdot d^6 + B \cdot a \cdot b^6 \cdot d^7) \cdot g^3 \cdot i^3 \cdot n \cdot x^6 + 84 \cdot (B \cdot b^7 \cdot c^2 \cdot d^5 + 3 \cdot B \cdot a \cdot b^6 \cdot c \cdot d^6 + B \cdot a^2 \cdot b^5 \cdot d^7) \cdot g^3 \cdot i^3 \cdot n \cdot x^5 + 35 \cdot (B \cdot b^7 \cdot c^3 \cdot d^4 + 9 \cdot B \cdot a \cdot b^6 \cdot c^2 \cdot d^5 + 9 \cdot B \cdot a^2 \cdot b^5 \cdot c \cdot d^6 + B \cdot a^3 \cdot b^4 \cdot d^7) \cdot g^3 \cdot i^3 \cdot n \cdot x^4 + 140 \cdot (B \cdot a \cdot b^6 \cdot c^3 \cdot d^4 + 3 \cdot B \cdot a^2 \cdot b^5 \cdot c^2 \cdot d^5 + B \cdot a^3 \cdot b^4 \cdot c \cdot d^6) \cdot g^3 \cdot i^3 \cdot n \cdot x^3 + 210 \cdot (B \cdot a^2 \cdot b^5 \cdot c^3 \cdot d^4 + B \cdot a^3 \cdot b^4 \cdot c^2 \cdot d^5) \cdot g^3 \cdot i^3 \cdot n \cdot x^2) \cdot \log((b \cdot x + a)/(d \cdot x + c)))/(b^4 \cdot d^4)$$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

---

**Giac [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac")
```

```
[Out] Timed out
```

$$3.128 \quad \int (ag+bgx)^2(ci+dix)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx$$

**Optimal.** Leaf size=387

$$\frac{b^2 g^2 i^3 (c+dx)^6 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{6d^3} + \frac{g^2 i^3 (c+dx)^4 (bc-ad)^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{4d^3} - \frac{2bg^2 i^3 (c+dx)^5 (bc-ad)}{5d^3}$$

[Out]  $-(B*(b*c - a*d)^5*g^2*i^3*n*x)/(60*b^3*d^2) - (B*(b*c - a*d)^4*g^2*i^3*n*(c + d*x)^2)/(120*b^2*d^3) - (B*(b*c - a*d)^3*g^2*i^3*n*(c + d*x)^3)/(180*b*d^3) + (7*B*(b*c - a*d)^2*g^2*i^3*n*(c + d*x)^4)/(120*d^3) - (b*B*(b*c - a*d)*g^2*i^3*n*(c + d*x)^5)/(30*d^3) + ((b*c - a*d)^2*g^2*i^3*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*d^3) - (2*b*(b*c - a*d)*g^2*i^3*(c + d*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(5*d^3) + (b^2*g^2*i^3*(c + d*x)^6*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*d^3) - (B*(b*c - a*d)^6*g^2*i^3*n*Log[(a + b*x)/(c + d*x)])/(60*b^4*d^3) - (B*(b*c - a*d)^6*g^2*i^3*n*Log[c + d*x])/(60*b^4*d^3)$

**Rubi [A]** time = 0.699664, antiderivative size = 345, normalized size of antiderivative = 0.89, number of steps used = 14, number of rules used = 4, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.093$ , Rules used = {2528, 2525, 12, 43}

$$\frac{b^2 g^2 i^3 (c+dx)^6 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{6d^3} + \frac{g^2 i^3 (c+dx)^4 (bc-ad)^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{4d^3} - \frac{2bg^2 i^3 (c+dx)^5 (bc-ad)}{5d^3}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[(a*g + b*g*x)^2*(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]), x]$

[Out]  $-(B*(b*c - a*d)^5*g^2*i^3*n*x)/(60*b^3*d^2) - (B*(b*c - a*d)^4*g^2*i^3*n*(c + d*x)^2)/(120*b^2*d^3) - (B*(b*c - a*d)^3*g^2*i^3*n*(c + d*x)^3)/(180*b*d^3) + (7*B*(b*c - a*d)^2*g^2*i^3*n*(c + d*x)^4)/(120*d^3) - (b*B*(b*c - a*d)*g^2*i^3*n*(c + d*x)^5)/(30*d^3) - (B*(b*c - a*d)^6*g^2*i^3*n*Log[a + b*x])/(60*b^4*d^3) + ((b*c - a*d)^2*g^2*i^3*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*d^3) - (2*b*(b*c - a*d)*g^2*i^3*(c + d*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(5*d^3) + (b^2*g^2*i^3*(c + d*x)^6*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*d^3)$

**Rule 2528**

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[ {u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x] }, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

### Rubi steps



$$\begin{aligned}
\int (128c + 128dx)^3 (ag + bgx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx &= \int \left( \frac{(-bc + ad)^2 g^2 (128c + 128dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{d^2} \right) dx \\
&= \frac{(b^2 g^2) \int (128c + 128dx)^5 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx}{16384 d^2} \\
&= \frac{524288 (bc - ad)^2 g^2 (c + dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{d^3} \\
&= \frac{524288 (bc - ad)^2 g^2 (c + dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{d^3} \\
&= \frac{524288 (bc - ad)^2 g^2 (c + dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{d^3} \\
&= -\frac{524288 B (bc - ad)^5 g^2 n x}{15 b^3 d^2} - \frac{262144 B (bc - ad)^4 g^2 n (c + dx)}{15 b^2 d^3}
\end{aligned}$$

**Mathematica [A]** time = 0.345287, size = 441, normalized size = 1.14

$$\frac{g^2 i^3 \left( 60 b^6 (c + dx)^6 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right) - 144 b^5 (c + dx)^5 (bc - ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right) + 90 b^4 (c + dx)^4 (bc - ad) \right)}{d^3}$$

Antiderivative was successfully verified.

[In] Integrate[(a\*g + b\*g\*x)^2\*(c+i + d\*i\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]),x]

[Out] (g^2\*i^3\*(-15\*B\*(b\*c - a\*d)^3\*n\*(6\*b\*d\*(b\*c - a\*d)^2\*x + 3\*b^2\*(b\*c - a\*d)\*(c + d\*x)^2 + 2\*b^3\*(c + d\*x)^3 + 6\*(b\*c - a\*d)^3\*Log[a + b\*x]) + 12\*B\*(b\*c - a\*d)^2\*n\*(12\*b\*d\*(b\*c - a\*d)^3\*x + 6\*b^2\*(b\*c - a\*d)^2\*(c + d\*x)^2 + 4\*b^3\*(b\*c - a\*d)\*(c + d\*x)^3 + 3\*b^4\*(c + d\*x)^4 + 12\*(b\*c - a\*d)^4\*Log[a + b\*x]) - B\*(b\*c - a\*d)\*n\*(60\*b\*d\*(b\*c - a\*d)^4\*x + 30\*b^2\*(b\*c - a\*d)^3\*(c + d\*x)^2 + 20\*b^3\*(b\*c - a\*d)^2\*(c + d\*x)^3 + 15\*b^4\*(b\*c - a\*d)\*(c + d\*x)^4 + 12\*b^5\*(c + d\*x)^5 + 60\*(b\*c - a\*d)^5\*Log[a + b\*x]) + 90\*b^4\*(b\*c - a\*d)^2\*(c + d\*x)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 144\*b^5\*(b\*c - a\*d)\*(c + d\*x)^5\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 60\*b^6\*(c + d\*x)^6\*(A

+ B\*Log[e\*((a + b\*x)/(c + d\*x))^n]]/(360\*b^4\*d^3)

**Maple [F]** time = 0.688, size = 0, normalized size = 0.

$$\int (bgx + ag)^2 (dix + ci)^3 \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)^3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n)),x)

[Out] int((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)^3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n)),x)

**Maxima [B]** time = 1.53378, size = 2670, normalized size = 6.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n)),x, a  
lgorithm="maxima")

[Out] 1/6\*B\*b^2\*d^3\*g^2\*i^3\*x^6\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n) + 1/6\*A\*b^2\*d^3\*g^2\*i^3\*x^6 + 3/5\*B\*b^2\*c\*d^2\*g^2\*i^3\*x^5\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n) + 2/5\*B\*a\*b\*d^3\*g^2\*i^3\*x^5\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n) + 3/5\*A\*b^2\*c\*d^2\*g^2\*i^3\*x^5 + 2/5\*A\*a\*b\*d^3\*g^2\*i^3\*x^5 + 3/4\*B\*b^2\*c^2\*d\*g^2\*i^3\*x^4\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n) + 3/2\*B\*a\*b\*c\*d^2\*g^2\*i^3\*x^4\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n) + 1/4\*B\*a^2\*d^3\*g^2\*i^3\*x^4\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n) + 3/4\*A\*b^2\*c^2\*d\*g^2\*i^3\*x^4 + 3/2\*A\*a\*b\*c\*d^2\*g^2\*i^3\*x^4 + 1/4\*A\*a^2\*d^3\*g^2\*i^3\*x^4 + 1/3\*B\*b^2\*c^3\*g^2\*i^3\*x^3\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n) + 2\*B\*a\*b\*c^2\*d\*g^2\*i^3\*x^3\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n) + B\*a^2\*c\*d^2\*g^2\*i^3\*x^3\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n) + 1/3\*A\*b^2\*c^3\*g^2\*i^3\*x^3 + 2\*A\*a\*b\*c^2\*d\*g^2\*i^3\*x^3 + A\*a^2\*c\*d^2\*g^2\*i^3\*x^3 + B\*a\*b\*c^3\*g^2\*i^3\*x^2\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n) + 3/2\*B\*a^2\*c^2\*d\*g^2\*i^3\*x^2\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n) + A\*a\*b\*c^3\*g^2\*i^3\*x^2 + 3/2\*A\*a^2\*c^2\*d\*g^2\*i^3\*x^2 - 1/360\*B\*b^2\*d^3\*g^2\*i^3\*n\*(60\*a^6\*log(b\*x + a)/b^6 - 60\*c^6\*log(d\*x + c)/d^6 + (12\*(b^5\*c\*d^4 - a\*b^4\*d^5)\*x^5 - 15\*(b^5\*c^2\*d^3 - a^2\*b^3\*d^5)\*x^4 + 20\*(b^5\*c^3\*d^2 - a^3\*b^2\*d^5)\*x^3 - 30\*(b^5\*c^4\*d - a^4\*b\*d^5)\*x^2 + 60\*(b^5\*c^5 - a^5\*d^5)\*x - 60\*(b^5\*c^6 - a^6\*d^6))

$$\begin{aligned}
& 5*c^5 - a^5*d^5)*x)/(b^5*d^5)) + 1/20*B*b^2*c*d^2*g^2*i^3*n*(12*a^5*log(b*x \\
& + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b \\
& ^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 \\
& - a^4*d^4)*x)/(b^4*d^4)) + 1/30*B*a*b*d^3*g^2*i^3*n*(12*a^5*log(b*x + a)/b \\
& ^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2* \\
& d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4* \\
& d^4)*x)/(b^4*d^4)) - 1/8*B*b^2*c^2*d*g^2*i^3*n*(6*a^4*log(b*x + a)/b^4 - 6* \\
& c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2* \\
& b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) - 1/4*B*a*b*c*d^2*g^2*i^3* \\
& n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2* \\
& d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^ \\
& 3)) - 1/24*B*a^2*d^3*g^2*i^3*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c) \\
& /d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*( \\
& b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + 1/6*B*b^2*c^3*g^2*i^3*n*(2*a^3*log(b*x + \\
& a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - \\
& a^2*d^2)*x)/(b^2*d^2)) + B*a*b*c^2*d*g^2*i^3*n*(2*a^3*log(b*x + a)/b^3 - 2* \\
& c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/ \\
& (b^2*d^2)) + 1/2*B*a^2*c*d^2*g^2*i^3*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log( \\
& d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2 \\
& )) - B*a*b*c^3*g^2*i^3*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b* \\
& c - a*d)*x/(b*d)) - 3/2*B*a^2*c^2*d*g^2*i^3*n*(a^2*log(b*x + a)/b^2 - c^2*log \\
& (d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + B*a^2*c^3*g^2*i^3*n*(a*log(b*x + a) \\
& )/b - c*log(d*x + c)/d) + B*a^2*c^3*g^2*i^3*x*log(e*(b*x/(d*x + c) + a/(d*x \\
& + c))^n) + A*a^2*c^3*g^2*i^3*x
\end{aligned}$$

**Fricas [B]** time = 1.15396, size = 2202, normalized size = 5.69

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n)),x, a  
lgorithm="fricas")

[Out] 1/360\*(60\*A\*b^6\*d^6\*g^2\*i^3\*x^6 + 6\*(20\*B\*a^3\*b^3\*c^3\*d^3 - 15\*B\*a^4\*b^2\*c^2\*d^4 + 6\*B\*a^5\*b\*c\*d^5 - B\*a^6\*d^6)\*g^2\*i^3\*n\*log(b\*x + a) - 6\*(B\*b^6\*c^6\*d^5 - 6\*B\*a\*b^5\*c^5\*d + 15\*B\*a^2\*b^4\*c^4\*d^2)\*g^2\*i^3\*n\*log(d\*x + c) - 12\*((B\*b^6\*c^6\*d^5 - B\*a\*b^5\*d^6)\*g^2\*i^3\*n - 6\*(3\*A\*b^6\*c\*d^5 + 2\*A\*a\*b^5\*d^6)\*g^2\*i^3)\*x^5 - 3\*((13\*B\*b^6\*c^2\*d^4 - 6\*B\*a\*b^5\*c\*d^5 - 7\*B\*a^2\*b^4\*d^6)\*g^2\*i^3\*n - 30\*(3\*A\*b^6\*c^2\*d^4 + 6\*A\*a\*b^5\*c\*d^5 + A\*a^2\*b^4\*d^6)\*g^2\*i^3)\*x^4 - 2\*((19\*B\*b^6\*c^3\*d^3 + 21\*B\*a\*b^5\*c^2\*d^4 - 39\*B\*a^2\*b^4\*c\*d^5 - B\*a^3\*b^3\*d^6)\*g^2\*i^3\*n - 60\*(A\*b^6\*c^3\*d^3 + 6\*A\*a\*b^5\*c^2\*d^4 + 3\*A\*a^2\*b^4\*c\*d^5)

$$\begin{aligned} & *g^{2i^3} * x^3 - 3 * ((B * b^6 * c^4 * d^2 + 34 * B * a * b^5 * c^3 * d^3 - 30 * B * a^2 * b^4 * c^2 * d^4 - 6 * B * a^3 * b^3 * c * d^5 + B * a^4 * b^2 * d^6) * g^{2i^3 * n} - 60 * (2 * A * a * b^5 * c^3 * d^3 + 3 * A * a^2 * b^4 * c^2 * d^4) * g^{2i^3} * x^2 + 6 * (60 * A * a^2 * b^4 * c^3 * d^3 * g^{2i^3} + (B * b^6 * c^5 * d - 6 * B * a * b^5 * c^4 * d^2 - 5 * B * a^2 * b^4 * c^3 * d^3 + 15 * B * a^3 * b^3 * c^2 * d^4 - 6 * B * a^4 * b^2 * c * d^5 + B * a^5 * b * d^6) * g^{2i^3 * n}) * x + 6 * (10 * B * b^6 * d^6 * g^{2i^3 * x^6} + 60 * B * a^2 * b^4 * c^3 * d^3 * g^{2i^3 * x} + 12 * (3 * B * b^6 * c * d^5 + 2 * B * a * b^5 * d^6) * g^{2i^3 * x^5} + 15 * (3 * B * b^6 * c^2 * d^4 + 6 * B * a * b^5 * c * d^5 + B * a^2 * b^4 * d^6) * g^{2i^3 * x^4} + 20 * (B * b^6 * c^3 * d^3 + 6 * B * a * b^5 * c^2 * d^4 + 3 * B * a^2 * b^4 * c * d^5) * g^{2i^3 * x^3} + 30 * (2 * B * a * b^5 * c^3 * d^3 + 3 * B * a^2 * b^4 * c^2 * d^4) * g^{2i^3 * x^2}) * \log(e) + 6 * (10 * B * b^6 * d^6 * g^{2i^3 * n * x^6} + 60 * B * a^2 * b^4 * c^3 * d^3 * g^{2i^3 * n * x} + 12 * (3 * B * b^6 * c * d^5 + 2 * B * a * b^5 * d^6) * g^{2i^3 * n * x^5} + 15 * (3 * B * b^6 * c^2 * d^4 + 6 * B * a * b^5 * c * d^5 + B * a^2 * b^4 * d^6) * g^{2i^3 * n * x^4} + 20 * (B * b^6 * c^3 * d^3 + 6 * B * a * b^5 * c^2 * d^4 + 3 * B * a^2 * b^4 * c * d^5) * g^{2i^3 * n * x^3} + 30 * (2 * B * a * b^5 * c^3 * d^3 + 3 * B * a^2 * b^4 * c^2 * d^4) * g^{2i^3 * n * x^2}) * \log((b * x + a) / (d * x + c)) / (b^4 * d^3) \end{aligned}$$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*\*2\*(d\*i\*x+c\*i)\*\*3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n)),x)

[Out] Timed out

**Giac [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n)),x, algorithm="giac")

[Out] Timed out

$$3.129 \quad \int (ag + bgx)(ci + dix)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx$$

**Optimal.** Leaf size=283

$$\frac{gi^3(c+dx)^4(bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{4d^2} + \frac{bgi^3(c+dx)^5 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{5d^2} + \frac{Bgi^3n(c+dx)^2(bc-ad)^3}{40b^2d^2} + \dots$$

[Out] (B\*(b\*c - a\*d)^4\*g\*i^3\*n\*x)/(20\*b^3\*d) + (B\*(b\*c - a\*d)^3\*g\*i^3\*n\*(c + d\*x)^2)/(40\*b^2\*d^2) + (B\*(b\*c - a\*d)^2\*g\*i^3\*n\*(c + d\*x)^3)/(60\*b\*d^2) - (B\*(b\*c - a\*d)\*g\*i^3\*n\*(c + d\*x)^4)/(20\*d^2) - ((b\*c - a\*d)\*g\*i^3\*(c + d\*x)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(4\*d^2) + (b\*g\*i^3\*(c + d\*x)^5\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(5\*d^2) + (B\*(b\*c - a\*d)^5\*g\*i^3\*n\*Log[(a + b\*x)/(c + d\*x)])/(20\*b^4\*d^2) + (B\*(b\*c - a\*d)^5\*g\*i^3\*n\*Log[c + d\*x])/(20\*b^4\*d^2)

**Rubi [A]** time = 0.381663, antiderivative size = 243, normalized size of antiderivative = 0.86, number of steps used = 10, number of rules used = 4, integrand size = 41,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.098$ , Rules used = {2528, 2525, 12, 43}

$$\frac{gi^3(c+dx)^4(bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{4d^2} + \frac{bgi^3(c+dx)^5 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{5d^2} + \frac{Bgi^3n(c+dx)^2(bc-ad)^3}{40b^2d^2} + \dots$$

Antiderivative was successfully verified.

[In] Int[(a\*g + b\*g\*x)\*(c\*i + d\*i\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]),x]

[Out] (B\*(b\*c - a\*d)^4\*g\*i^3\*n\*x)/(20\*b^3\*d) + (B\*(b\*c - a\*d)^3\*g\*i^3\*n\*(c + d\*x)^2)/(40\*b^2\*d^2) + (B\*(b\*c - a\*d)^2\*g\*i^3\*n\*(c + d\*x)^3)/(60\*b\*d^2) - (B\*(b\*c - a\*d)\*g\*i^3\*n\*(c + d\*x)^4)/(20\*d^2) + (B\*(b\*c - a\*d)^5\*g\*i^3\*n\*Log[a + b\*x])/(20\*b^4\*d^2) - ((b\*c - a\*d)\*g\*i^3\*(c + d\*x)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(4\*d^2) + (b\*g\*i^3\*(c + d\*x)^5\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(5\*d^2)

### Rule 2528

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*(RGx\_), x\_Symbol] :> With[{u = ExpandIntegrand[(a + b\*Log[c\*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x]

onQ[RGx, x] && IGtQ[n, 0]

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_) /; FreeQ[b, x]]
```

### Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && LeQ[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

### Rubi steps

$$\begin{aligned}
\int (129c + 129dx)^3 (ag + bgx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx &= \int \left( \frac{(-bc + ad)g(129c + 129dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{d} \right) dx \\
&= \frac{(bg) \int (129c + 129dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx}{129d} + \dots \\
&= -\frac{2146689(bc - ad)g(c + dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{4d^2} + \dots \\
&= -\frac{2146689(bc - ad)g(c + dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{4d^2} + \dots \\
&= -\frac{2146689(bc - ad)g(c + dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{4d^2} + \dots \\
&= \frac{2146689B(bc - ad)^4 gnx}{20b^3d} + \frac{2146689B(bc - ad)^3 gn(c + dx)}{40b^2d^2}
\end{aligned}$$

**Mathematica [A]** time = 0.214849, size = 269, normalized size = 0.95

$$\frac{gi^3 \left( 24b(c + dx)^5 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right) - 30(c + dx)^4 (bc - ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right) + \frac{5Bn(bc-ad)^2(3b^2(c+dx)^2(bc-ad)+6b^2c^2)}{120d^2} \right)}{120d^2}$$

Antiderivative was successfully verified.

[In] Integrate[(a\*g + b\*g\*x)\*(c\*i + d\*i\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]),x]

[Out] (g\*i^3\*((5\*B\*(b\*c - a\*d)^2\*n\*(6\*b\*d\*(b\*c - a\*d)^2\*x + 3\*b^2\*(b\*c - a\*d)\*(c + d\*x)^2 + 2\*b^3\*(c + d\*x)^3 + 6\*(b\*c - a\*d)^3\*Log[a + b\*x]))/b^4 - (2\*B\*(b\*c - a\*d)\*n\*(12\*b\*d\*(b\*c - a\*d)^3\*x + 6\*b^2\*(b\*c - a\*d)^2\*(c + d\*x)^2 + 4\*b^3\*(b\*c - a\*d)\*(c + d\*x)^3 + 3\*b^4\*(c + d\*x)^4 + 12\*(b\*c - a\*d)^4\*Log[a + b\*x]))/b^4 - 30\*(b\*c - a\*d)\*(c + d\*x)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 24\*b\*(c + d\*x)^5\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(120\*d^2)

**Maple [F]** time = 0.536, size = 0, normalized size = 0.

$$\int (bgx + ag)(dix + ci)^3 \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)^3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n)),x)

[Out] int((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)^3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n)),x)

**Maxima [B]** time = 1.50127, size = 1509, normalized size = 5.33

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n)),x, algorithm="maxima")

[Out]  $\frac{1}{5}B*b*d^3*g*i^3*x^5*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + \frac{1}{5}A*b*d^3*g*i^3*x^5 + \frac{3}{4}B*b*c*d^2*g*i^3*x^4*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + \frac{1}{4}B*a*d^3*g*i^3*x^4*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + \frac{3}{4}A*b*c*d^2*g*i^3*x^4 + \frac{1}{4}A*a*d^3*g*i^3*x^4 + B*b*c^2*d*g*i^3*x^3*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + B*a*c*d^2*g*i^3*x^3*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*b*c^2*d*g*i^3*x^3 + A*a*c*d^2*g*i^3*x^3 + \frac{1}{2}B*b*c^3*g*i^3*x^2*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + \frac{3}{2}B*a*c^2*d*g*i^3*x^2*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + \frac{1}{2}A*b*c^3*g*i^3*x^2 + \frac{3}{2}A*a*c^2*d*g*i^3*x^2 + \frac{1}{60}B*b*d^3*g*i^3*n*(12*a^5*\log(b*x + a)/b^5 - 12*c^5*\log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4)) - \frac{1}{8}B*b*c*d^2*g*i^3*n*(6*a^4*\log(b*x + a)/b^4 - 6*c^4*\log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) - \frac{1}{24}B*a*d^3*g*i^3*n*(6*a^4*\log(b*x + a)/b^4 - 6*c^4*\log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + \frac{1}{2}B*b*c^2*d*g*i^3*n*(2*a^3*\log(b*x + a)/b^3 - 2*c^3*\log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) + \frac{1}{2}B*a*c*d^2*g*i^3*n*(2*a^3*\log(b*x + a)/b^3 - 2*c^3*\log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - \frac{1}{2}B*b*c^3*g*i^3*n*(a^2*\log(b*x + a)/b^2 - c^2*\log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) - \frac{3}{2}B*a*c^2*d*g*i^3*n*(a^2*\log(b*x + a)/b^2 - c^2*\log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + B*a*c^3*g*i^3*n*(a$



$\log(bx + a)/b - c \log(dx + c)/d + B a^3 c^3 g^3 i^3 x \log(e \cdot (bx/(dx + c) + a/(dx + c))^n) + A a^3 c^3 g^3 i^3 x$

**Fricas [B]** time = 0.796294, size = 1501, normalized size = 5.3

$24 A b^5 d^5 g^3 i^3 x^5 + 6 (10 B a^2 b^3 c^3 d^2 - 10 B a^3 b^2 c^2 d^3 + 5 B a^4 b c d^4 - B a^5 d^5) g^3 i^3 n \log(bx + a) + 6 (B b^5 c^5 - 5 B a b^4 c^4 d) g^3 i^3 n \log(dx + c)$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n)),x, algorithm="fricas")

[Out]  $\frac{1}{120} (24 A b^5 d^5 g^3 i^3 x^5 + 6 (10 B a^2 b^3 c^3 d^2 - 10 B a^3 b^2 c^2 d^3 + 5 B a^4 b c d^4 - B a^5 d^5) g^3 i^3 n \log(bx + a) + 6 (B b^5 c^5 - 5 B a b^4 c^4 d) g^3 i^3 n \log(dx + c) - 6 ((B b^5 c^3 d^4 - B a b^4 d^5) g^3 i^3 n - 5 (3 A b^5 c^3 d^4 + A a b^4 d^5) g^3 i^3) x^4 - 2 ((11 B b^5 c^2 d^3 - 10 B a b^4 c^2 d^4 - B a^2 b^3 d^5) g^3 i^3 n - 60 (A b^5 c^2 d^3 + A a b^4 c^2 d^4) g^3 i^3) x^3 - 3 ((9 B b^5 c^3 d^2 - 5 B a b^4 c^2 d^3 - 5 B a^2 b^3 c^2 d^4 + B a^3 b^2 d^5) g^3 i^3 n - 20 (A b^5 c^3 d^2 + 3 A a b^4 c^2 d^3) g^3 i^3) x^2 + 6 (20 A a b^4 c^3 d^2 g^3 i^3 - (B b^5 c^4 d + 5 B a b^4 c^3 d^2 - 10 B a^2 b^3 c^2 d^3 + 5 B a^3 b^2 c^2 d^4 - B a^4 b d^5) g^3 i^3 n) x + 6 (4 B b^5 d^5 g^3 i^3 x^5 + 20 B a b^4 c^3 d^2 g^3 i^3 x + 5 (3 B b^5 c^3 d^4 + B a b^4 d^5) g^3 i^3 x^4 + 20 (B b^5 c^2 d^3 + B a b^4 c^2 d^4) g^3 i^3 x^3 + 10 (B b^5 c^3 d^2 + 3 B a b^4 c^2 d^3) g^3 i^3 x^2) \log(e) + 6 (4 B b^5 d^5 g^3 i^3 n x^5 + 20 B a b^4 c^3 d^2 g^3 i^3 n x + 5 (3 B b^5 c^3 d^4 + B a b^4 d^5) g^3 i^3 n x^4 + 20 (B b^5 c^2 d^3 + B a b^4 c^2 d^4) g^3 i^3 n x^3 + 10 (B b^5 c^3 d^2 + 3 B a b^4 c^2 d^3) g^3 i^3 n x^2) \log((bx + a)/(dx + c))) / (b^4 d^2)$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)\*\*3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n)),x)

[Out] Timed out

---

**Giac [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac")
```

```
[Out] Timed out
```

$$3.130 \quad \int (ci + dix)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx$$

**Optimal.** Leaf size=156

$$\frac{i^3(c+dx)^4 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{4d} - \frac{Bi^3nx(bc-ad)^3}{4b^3} - \frac{Bi^3n(c+dx)^2(bc-ad)^2}{8b^2d} - \frac{Bi^3n(bc-ad)^4 \log(a+bx)}{4b^4d} - \frac{Bi^3n(c+dx)^4 \log(a+bx)}{4b^4d}$$

[Out]  $-(B*(b*c - a*d)^3*i^3*n*x)/(4*b^3) - (B*(b*c - a*d)^2*i^3*n*(c + d*x)^2)/(8*b^2*d) - (B*(b*c - a*d)*i^3*n*(c + d*x)^3)/(12*b*d) - (B*(b*c - a*d)^4*i^3*n*Log[a + b*x])/(4*b^4*d) + (i^3*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*d)$

**Rubi [A]** time = 0.0859817, antiderivative size = 156, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 33,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$ , Rules used = {2525, 12, 43}

$$\frac{i^3(c+dx)^4 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{4d} - \frac{Bi^3nx(bc-ad)^3}{4b^3} - \frac{Bi^3n(c+dx)^2(bc-ad)^2}{8b^2d} - \frac{Bi^3n(bc-ad)^4 \log(a+bx)}{4b^4d} - \frac{Bi^3n(c+dx)^4 \log(a+bx)}{4b^4d}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]$

[Out]  $-(B*(b*c - a*d)^3*i^3*n*x)/(4*b^3) - (B*(b*c - a*d)^2*i^3*n*(c + d*x)^2)/(8*b^2*d) - (B*(b*c - a*d)*i^3*n*(c + d*x)^3)/(12*b*d) - (B*(b*c - a*d)^4*i^3*n*Log[a + b*x])/(4*b^4*d) + (i^3*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*d)$

### Rule 2525

$\text{Int}[(a_. + \text{Log}[(c_.)*(RfX_)^(p_.)]*(b_.))^n*(d_. + (e_.)*(x_.))^(m_.), x\_Symbol] \rightarrow \text{Simp}[(d + e*x)^(m + 1)*(a + b*\text{Log}[c*RfX^p])^n]/(e*(m + 1)), x] - \text{Dist}[(b*n*p)/(e*(m + 1)), \text{Int}[\text{SimplifyIntegrand}[(d + e*x)^(m + 1)*(a + b*\text{Log}[c*RfX^p])^(n - 1)*D[RfX, x])/RfX, x], x] /;$  FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RfX, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

### Rubi steps

$$\begin{aligned} \int (130c + 130dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx &= \frac{549250(c+dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{d} - \frac{(Bn) \int \frac{285610000(bc-ad)(c+dx)}{a+bx}}{520d} \\ &= \frac{549250(c+dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{d} - \frac{(549250B(bc-ad)n) \int \frac{c}{a+bx}}{d} \\ &= \frac{549250(c+dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{d} - \frac{(549250B(bc-ad)n) \int \left( \frac{c}{a+bx} \right)}{d} \\ &= -\frac{549250B(bc-ad)^3 nx}{b^3} - \frac{274625B(bc-ad)^2 n(c+dx)^2}{b^2 d} - \frac{549250B(bc-ad)n \int \frac{c}{a+bx}}{d} \end{aligned}$$

**Mathematica [A]** time = 0.0730872, size = 124, normalized size = 0.79

$$\frac{i^3 \left( (c+dx)^4 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right) - \frac{Bn(bc-ad)(3b^2(c+dx)^2(bc-ad)+6bdx(bc-ad)^2+6(bc-ad)^3 \log(a+bx)+2b^3(c+dx)^3)}{6b^4} \right)}{4d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] (i^3*(-(B*(b*c - a*d)*n*(6*b*d*(b*c - a*d)^2*x + 3*b^2*(b*c - a*d)*(c + d*x)
)^2 + 2*b^3*(c + d*x)^3 + 6*(b*c - a*d)^3*Log[a + b*x]))/(6*b^4) + (c + d*x
)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*d)
```

**Maple [F]** time = 0.498, size = 0, normalized size = 0.

$$\int (dix + ci)^3 \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)`

[Out] `int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)`

**Maxima [B]** time = 1.40797, size = 647, normalized size = 4.15

$$\frac{1}{4} B d^3 i^3 x^4 \log \left( e \left( \frac{bx}{dx+c} + \frac{a}{dx+c} \right)^n \right) + \frac{1}{4} A d^3 i^3 x^4 + B c d^2 i^3 x^3 \log \left( e \left( \frac{bx}{dx+c} + \frac{a}{dx+c} \right)^n \right) + A c d^2 i^3 x^3 + \frac{3}{2} B c^2 d i^3 x^2 \log \left( e \left( \frac{bx}{dx+c} + \frac{a}{dx+c} \right)^n \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxima")`

[Out] `1/4*B*d^3*i^3*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/4*A*d^3*i^3*x^4 + B*c*d^2*i^3*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*c*d^2*i^3*x^3 + 3/2*B*c^2*d*i^3*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/2*A*c^2*d*i^3*x^2 - 1/24*B*d^3*i^3*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + 1/2*B*c*d^2*i^3*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 3/2*B*c^2*d*i^3*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + B*c^3*i^3*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + B*c^3*i^3*x*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*c^3*i^3*x`

**Fricas [B]** time = 0.635179, size = 883, normalized size = 5.66

$$6 A b^4 d^4 i^3 x^4 - 6 B b^4 c^4 i^3 n \log(dx + c) + 6 (4 B a b^3 c^3 d - 6 B a^2 b^2 c^2 d^2 + 4 B a^3 b c d^3 - B a^4 d^4) i^3 n \log(bx + a) + 2 (12 A b^4 c d^4 - 6 A b^4 c^2 d^3 + 6 A b^4 c^3 d^2 - 6 A b^4 c^4 d) i^3 n$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n)),x, algorithm="fricas")

[Out]  $\frac{1}{24}*(6*A*b^4*d^4*i^3*x^4 - 6*B*b^4*c^4*i^3*n*\log(d*x + c) + 6*(4*B*a*b^3*c^3*d - 6*B*a^2*b^2*c^2*d^2 + 4*B*a^3*b*c*d^3 - B*a^4*d^4)*i^3*n*\log(b*x + a) + 2*(12*A*b^4*c*d^3*i^3 - (B*b^4*c*d^3 - B*a*b^3*d^4)*i^3*n)*x^3 + 3*(12*A*b^4*c^2*d^2*i^3 - (3*B*b^4*c^2*d^2 - 4*B*a*b^3*c*d^3 + B*a^2*b^2*d^4)*i^3*n)*x^2 + 6*(4*A*b^4*c^3*d*i^3 - (3*B*b^4*c^3*d - 6*B*a*b^3*c^2*d^2 + 4*B*a^2*b^2*c*d^3 - B*a^3*b*d^4)*i^3*n)*x + 6*(B*b^4*d^4*i^3*x^4 + 4*B*b^4*c*d^3*i^3*x^3 + 6*B*b^4*c^2*d^2*i^3*x^2 + 4*B*b^4*c^3*d*i^3*x)*\log(e) + 6*(B*b^4*d^4*i^3*n*x^4 + 4*B*b^4*c*d^3*i^3*n*x^3 + 6*B*b^4*c^2*d^2*i^3*n*x^2 + 4*B*b^4*c^3*d*i^3*n*x)*\log((b*x + a)/(d*x + c)))/(b^4*d)$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*\*3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c)\*\*n))),x)

[Out] Timed out

**Giac [B]** time = 1.36517, size = 680, normalized size = 4.36

$$-\frac{1}{4}(Ad^3i + Bd^3i)x^4 + \frac{(Bbcd^2in - Bad^3in - 12Abcd^2i - 12Bbcd^2i)x^3}{12b} - \frac{1}{4}(Ba^3inx^4 + 4Bcd^2inx^3 + 6Bc^2dinx^2 + 4Bc^3in$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n)),x, algorithm="giac")

[Out]  $-1/4*(A*d^3*i + B*d^3*i)*x^4 + 1/12*(B*b*c*d^2*i*n - B*a*d^3*i*n - 12*A*b*c*d^2*i - 12*B*b*c*d^2*i)*x^3/b - 1/4*(B*d^3*i*n*x^4 + 4*B*c*d^2*i*n*x^3 + 6*B*c^2*d*i*n*x^2 + 4*B*c^3*i*n*x)*\log((b*x + a)/(d*x + c)) + 1/8*(3*B*b^2*c^2*d*i*n - 4*B*a*b*c*d^2*i*n + B*a^2*d^3*i*n - 12*A*b^2*c^2*d*i - 12*B*b^2*c^2*d*i)*x^2/b^2 + 1/4*(3*B*b^3*c^3*i*n - 6*B*a*b^2*c^2*d*i*n + 4*B*a^2*b*c$

$$\begin{aligned}
& *d^{2i}n - B*a^3*d^3*i*n - 4*A*b^3*c^3*i - 4*B*b^3*c^3*i)*x/b^3 + 1/8*(B*b^4*c^4*i*n - 4*B*a*b^3*c^3*d*i*n + 6*B*a^2*b^2*c^2*d^2*i*n - 4*B*a^3*b*c*d^3*i*n + B*a^4*d^4*i*n)*\log(\text{abs}(b*d*x^2 + b*c*x + a*d*x + a*c))/(b^4*d) - 1/8 \\
& *(B*b^5*c^5*i*n + 3*B*a*b^4*c^4*d*i*n - 10*B*a^2*b^3*c^3*d^2*i*n + 10*B*a^3*b^2*c^2*d^3*i*n - 5*B*a^4*b*c*d^4*i*n + B*a^5*d^5*i*n)*\log(\text{abs}((2*b*d*x + b*c + a*d - \text{abs}(-b*c + a*d))/(2*b*d*x + b*c + a*d + \text{abs}(-b*c + a*d))))/(b^4*d*\text{abs}(-b*c + a*d))
\end{aligned}$$

$$3.131 \quad \int \frac{(ci+dx)^3 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{ag+bgx} dx$$

**Optimal.** Leaf size=373

$$\frac{Bi^3n(bc-ad)^3 \text{PolyLog} \left( 2, \frac{b(c+dx)}{d(a+bx)} \right)}{b^4g} + \frac{i^3(c+dx)^2(bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{2b^2g} + \frac{di^3(a+bx)(bc-ad)^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^4g}$$

[Out]  $(-5*B*d*(b*c - a*d)^2*i^3*n*x)/(6*b^3*g) - (B*(b*c - a*d)*i^3*n*(c + d*x)^2)/(6*b^2*g) + (d*(b*c - a*d)^2*i^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^4*g) + ((b*c - a*d)*i^3*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*b^2*g) + (i^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b*g) - (5*B*(b*c - a*d)^3*i^3*n*Log[(a + b*x)/(c + d*x)])/(6*b^4*g) - (11*B*(b*c - a*d)^3*i^3*n*Log[c + d*x])/(6*b^4*g) - ((b*c - a*d)^3*i^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^4*g) + (B*(b*c - a*d)^3*i^3*n*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g)$

**Rubi [A]** time = 0.600166, antiderivative size = 455, normalized size of antiderivative = 1.22, number of steps used = 22, number of rules used = 13, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.302$ , Rules used = {2528, 2486, 31, 2524, 2418, 2390, 12, 2301, 2394, 2393, 2391, 2525, 43}

$$\frac{Bi^3n(bc-ad)^3 \text{PolyLog} \left( 2, -\frac{d(a+bx)}{bc-ad} \right)}{b^4g} + \frac{i^3(c+dx)^2(bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{2b^2g} + \frac{i^3(bc-ad)^3 \log(ag+bgx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^4g}$$

Antiderivative was successfully verified.

[In] Int[((c\*i + d\*i\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(a\*g + b\*g\*x), x]

[Out]  $(A*d*(b*c - a*d)^2*i^3*x)/(b^3*g) - (5*B*d*(b*c - a*d)^2*i^3*n*x)/(6*b^3*g) - (B*(b*c - a*d)*i^3*n*(c + d*x)^2)/(6*b^2*g) - (5*B*(b*c - a*d)^3*i^3*n*Log[a + b*x])/(6*b^4*g) - (B*(b*c - a*d)^3*i^3*n*Log[g*(a + b*x)]^2)/(2*b^4*g) + (B*d*(b*c - a*d)^2*i^3*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(b^4*g) + ((b*c - a*d)*i^3*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*b^2*g) + (i^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b*g) - (B*(b*c - a*d)^3*i^3*n*Log[c + d*x])/(b^4*g) + ((b*c - a*d)^3*i^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[a*g + b*g*x])/(b^4*g) + (B*(b*c - a*d)$



$$^3i^3n \text{Log}[(b*(c + d*x))/(b*c - a*d)] * \text{Log}[a*g + b*g*x]/(b^4*g) + (B*(b*c - a*d)^3i^3n * \text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]/(b^4*g)$$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x] }, Int[u, x] /; SumQ[u]
] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s - 1/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

### Rule 31

```
Int[((a_) + (b_.)*(x_))^(n_), x_Symbol] := Simp[Log[RemoveContent[a + b*x, x]]/b, x] /; FreeQ[{a, b}, x]
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

Rule 12

Int[(a\_)\*(u\_), x\_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b\_)\*(v\_)] /; FreeQ[b, x]

Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] := Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] := -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

Rule 2525

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*((d\_.) + (e\_.)\*(x\_))^(m\_.), x\_Symbol] := Simp[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^n)/(e\*(m + 1)), x] - Dist[(b\*n\*p)/(e\*(m + 1)), Int[SimplifyIntegrand[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

Rule 43

Int[((a\_.) + (b\_.)\*(x\_))^(m\_.)\*((c\_.) + (d\_.)\*(x\_))^(n\_.), x\_Symbol] := Int[ExpandIntegrand[(a + b\*x)^m\*(c + d\*x)^n, x], x] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b\*c - a\*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && LeQ[7\*m + 4\*n + 4, 0]) || LtQ[9\*m + 5\*(n + 1), 0] || GtQ[m + n + 2, 0])

Rubi steps

$$\begin{aligned}
\int \frac{(131c + 131dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{ag + bgx} dx &= \int \left( \frac{2248091d(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3g} + \frac{17161d(bc - ad)(131c + 131dx)^2}{b^3g} \right) dx \\
&= \frac{(2248091(bc - ad)^3) \int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{ag+bgx} dx}{b^3} + \frac{(131d) \int (131c + 131dx)^2}{b^3g} \\
&= \frac{2248091Ad(bc - ad)^2x}{b^3g} + \frac{2248091(bc - ad)(c + dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{2b^2g} \\
&= \frac{2248091Ad(bc - ad)^2x}{b^3g} + \frac{2248091Bd(bc - ad)^2(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^4g} \\
&= \frac{2248091Ad(bc - ad)^2x}{b^3g} + \frac{2248091Bd(bc - ad)^2(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^4g} \\
&= \frac{2248091Ad(bc - ad)^2x}{b^3g} - \frac{11240455Bd(bc - ad)^2nx}{6b^3g} - \frac{2248091B(bc - ad)^2}{6b^2} \\
&= \frac{2248091Ad(bc - ad)^2x}{b^3g} - \frac{11240455Bd(bc - ad)^2nx}{6b^3g} - \frac{2248091B(bc - ad)^2}{6b^2} \\
&= \frac{2248091Ad(bc - ad)^2x}{b^3g} - \frac{11240455Bd(bc - ad)^2nx}{6b^3g} - \frac{2248091B(bc - ad)^2}{6b^2}
\end{aligned}$$

**Mathematica [A]** time = 0.272942, size = 368, normalized size = 0.99

$$\frac{i^3 \left( -3Bn(bc - ad)^3 \left( \log(g(a + bx)) \left( \log(g(a + bx)) - 2 \log \left( \frac{b(c+dx)}{bc-ad} \right) \right) - 2 \text{PolyLog} \left( 2, \frac{d(a+bx)}{ad-bc} \right) \right) + 3b^2(c + dx)^2(bc - ad) \right)}{b^3g}$$

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(a\*g + b\*g\*x), x]

```
[Out] (i^3*(6*A*b*d*(b*c - a*d)^2*x - 3*B*(b*c - a*d)^2*n*(b*d*x + (b*c - a*d)*Log[a + b*x]) - B*(b*c - a*d)*n*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b*c - a*d)^2*Log[a + b*x]) + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] + 3*b^2*(b*c - a*d)*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 2*b^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 6*(b*c - a*d)^3*Log[g*(a + b*x)]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 6*B*(b*c - a*d)^3*n*Log[c + d*x] - 3*B*(b*c - a*d)^3*n*(Log[g*(a + b*x)]*(Log[g*(a + b*x)] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/((-b*c) + a*d)])))/(6*b^4*g)
```

**Maple [F]** time = 0.678, size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3}{bgx + ag} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x)
```

```
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x)
```

**Maxima [B]** time = 2.64474, size = 1262, normalized size = 3.38

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x, algorithm="maxima")
```

```
[Out] 3*A*c^2*d*i^3*(x/(b*g) - a*log(b*x + a)/(b^2*g)) - 1/6*A*d^3*i^3*(6*a^3*log(b*x + a)/(b^4*g) - (2*b^2*x^3 - 3*a*b*x^2 + 6*a^2*x)/(b^3*g)) + 3/2*A*c*d^2*i^3*(2*a^2*log(b*x + a)/(b^3*g) + (b*x^2 - 2*a*x)/(b^2*g)) + A*c^3*i^3*log(b*g*x + a*g)/(b*g) - 1/6*(11*b^2*c^3*i^3*n - 15*a*b*c^2*d*i^3*n + 6*a^2*c*d^2*i^3*n)*B*log(d*x + c)/(b^3*g) + (b^3*c^3*i^3*n - 3*a*b^2*c^2*d*i^3*n + 3*a^2*b*c*d^2*i^3*n - a^3*d^3*i^3*n)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B/(b^4*g) + 1/6*(2*B*b^3*d^3*i^3*x^3*log(e) - ((i^3*n - 9*i^3*log(e))*b^3*c*d^2 - (i^3*n - 3*i^3*log(e))*a*b^2*d^3)*B*x^2 - 3*(b^3*c^3*i^3*n - 3*a*b^2*c^2*d*i^3*n + 3*a^2*b*c*d^2
```

$$\begin{aligned} &^2i^3n - a^3d^3i^3n) * B * \log(b*x + a)^2 - ((7i^3n - 18i^3 * \log(e)) * b^3 \\ &* c^2 * d - 6(2i^3n - 3i^3 * \log(e)) * a * b^2 * c * d^2 + (5i^3n - 6i^3 * \log(e)) * \\ &a^2 * b * d^3) * B * x + (6b^3 * c^3 * i^3 * \log(e) + 18(i^3n - i^3 * \log(e)) * a * b^2 * c^2 * \\ &d - 9(3i^3n - 2i^3 * \log(e)) * a^2 * b * c * d^2 + (11i^3n - 6i^3 * \log(e)) * a^3 * \\ &d^3) * B * \log(b*x + a) + (2 * B * b^3 * d^3 * i^3 * x^3 + 3 * (3 * b^3 * c * d^2 * i^3 - a * b^2 * d^3 \\ &* i^3) * B * x^2 + 6 * (3 * b^3 * c^2 * d * i^3 - 3 * a * b^2 * c * d^2 * i^3 + a^2 * b * d^3 * i^3) * B * x + \\ &6 * (b^3 * c^3 * i^3 - 3 * a * b^2 * c^2 * d * i^3 + 3 * a^2 * b * c * d^2 * i^3 - a^3 * d^3 * i^3) * B * \log \\ &(b*x + a)) * \log((b*x + a)^n) - (2 * B * b^3 * d^3 * i^3 * x^3 + 3 * (3 * b^3 * c * d^2 * i^3 - \\ &a * b^2 * d^3 * i^3) * B * x^2 + 6 * (3 * b^3 * c^2 * d * i^3 - 3 * a * b^2 * c * d^2 * i^3 + a^2 * b * d^3 * i \\ &^3) * B * x + 6 * (b^3 * c^3 * i^3 - 3 * a * b^2 * c^2 * d * i^3 + 3 * a^2 * b * c * d^2 * i^3 - a^3 * d^3 * \\ &i^3) * B * \log(b*x + a)) * \log((d*x + c)^n)) / (b^4 * g) \end{aligned}$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{Ad^3i^3x^3 + 3Acd^2i^3x^2 + 3Ac^2di^3x + Ac^3i^3 + (Bd^3i^3x^3 + 3Bcd^2i^3x^2 + 3Bc^2di^3x + Bc^3i^3) \log\left(e^{\left(\frac{bx+a}{dx+c}\right)^n}\right)}{bgx + ag}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g),x, algorithm="fricas")

[Out] integral((A\*d^3\*i^3\*x^3 + 3\*A\*c\*d^2\*i^3\*x^2 + 3\*A\*c^2\*d\*i^3\*x + A\*c^3\*i^3 + (B\*d^3\*i^3\*x^3 + 3\*B\*c\*d^2\*i^3\*x^2 + 3\*B\*c^2\*d\*i^3\*x + B\*c^3\*i^3)\*log(e\*((b\*x + a)/(d\*x + c))^n))/(b\*g\*x + a\*g), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*\*3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n))/(b\*g\*x+a\*g),x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx + ci)^3 \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)}{bgx + ag} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g),x, algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)/(b*g*x + a*g), x)
```

$$3.132 \quad \int \frac{(ci+dx)^3 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ag+bgx)^2} dx$$

**Optimal.** Leaf size=390

$$\frac{3Bdi^3n(bc-ad)^2 \text{PolyLog} \left( 2, \frac{b(c+dx)}{d(a+bx)} \right)}{b^4g^2} + \frac{2d^2i^3(a+bx)(bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{b^4g^2} + \frac{di^3(c+dx)^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{2b^2g^2}$$

[Out]  $-(B*d^2*(b*c - a*d)*i^3*n*x)/(2*b^3*g^2) - (B*(b*c - a*d)^2*i^3*n*(c + d*x))/(b^3*g^2*(a + b*x)) + (2*d^2*(b*c - a*d)*i^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^4*g^2) - ((b*c - a*d)^2*i^3*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^3*g^2*(a + b*x)) + (d*i^3*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*b^2*g^2) - (B*d*(b*c - a*d)^2*i^3*n*Log[(a + b*x)/(c + d*x)])/(2*b^4*g^2) - (5*B*d*(b*c - a*d)^2*i^3*n*Log[c + d*x])/(2*b^4*g^2) - (3*d*(b*c - a*d)^2*i^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^2) + (3*B*d*(b*c - a*d)^2*i^3*n*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^2)$

**Rubi [A]** time = 0.6914, antiderivative size = 543, normalized size of antiderivative = 1.39, number of steps used = 21, number of rules used = 14, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.326$ , Rules used = {2528, 2486, 31, 2525, 12, 72, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{3Bdi^3n(bc-ad)^2 \text{PolyLog} \left( 2, -\frac{d(a+bx)}{bc-ad} \right)}{b^4g^2} - \frac{a^2Bd^3i^3n \log(a+bx)}{2b^4g^2} + \frac{d^3i^3x^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{2b^2g^2} + \frac{3di^3(bc-ad)^2 \log(a+bx)}{2b^2g^2}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[\frac{((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))}{(a*g + b*g*x)^2}, x]$

[Out]  $(A*d^2*(3*b*c - 2*a*d)*i^3*x)/(b^3*g^2) - (B*d^2*(b*c - a*d)*i^3*n*x)/(2*b^3*g^2) - (B*(b*c - a*d)^3*i^3*n)/(b^4*g^2*(a + b*x)) - (a^2*B*d^3*i^3*n*Log[a + b*x])/(2*b^4*g^2) - (B*d*(b*c - a*d)^2*i^3*n*Log[a + b*x])/(b^4*g^2) - (3*B*d*(b*c - a*d)^2*i^3*n*Log[a + b*x]^2)/(2*b^4*g^2) + (B*d^2*(3*b*c - 2*a*d)*i^3*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(b^4*g^2) + (d^3*i^3*x^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*b^2*g^2) - ((b*c - a*d)^3*i^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^4*g^2*(a + b*x)) + (3*d*(b*c - a*d)^2*i^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^4*g^2) +$

$$\frac{(B*c^2*d*i^3*n*\text{Log}[c + d*x])/(2*b^2*g^2) - (B*d*(3*b*c - 2*a*d)*(b*c - a*d)*i^3*n*\text{Log}[c + d*x])/(b^4*g^2) + (B*d*(b*c - a*d)^2*i^3*n*\text{Log}[c + d*x])/(b^4*g^2) + (3*B*d*(b*c - a*d)^2*i^3*n*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)])/(b^4*g^2) + (3*B*d*(b*c - a*d)^2*i^3*n*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))])/(b^4*g^2)}$$
Rule 2528

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]
] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.)]
^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(n_), x_Symbol] := Simp[Log[RemoveContent[a + b*x, x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_.)*(v_)] /; FreeQ[b, x]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] := Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
```



/; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]

#### Rule 44

Int[((a\_) + (b\_)\*(x\_))^(m\_)\*((c\_) + (d\_)\*(x\_))^(n\_), x\_Symbol] := Int[ExpandIntegrand[(a + b\*x)^m\*(c + d\*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b\*c - a\*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])

#### Rule 2524

Int[((a\_) + Log[(c\_)\*(RFX\_)^(p\_)])\*(b\_)^(n\_)/((d\_) + (e\_)\*(x\_)), x\_Symbol] := Simp[(Log[d + e\*x]\*(a + b\*Log[c\*RFX^p])^n)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[d + e\*x]\*(a + b\*Log[c\*RFX^p])^(n - 1)\*D[RFX, x])/RFX, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0]

#### Rule 2418

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_))^(n\_)])\*(b\_)^(p\_)\*(RFX\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n])^p, RFX, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFX, x] && IntegerQ[p]

#### Rule 2390

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_))^(n\_)])\*(b\_)^(p\_)\*((f\_) + (g\_)\*(x\_))^(q\_), x\_Symbol] := Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

#### Rule 2301

Int[((a\_) + Log[(c\_)\*(x\_)]^(n\_)]\*(b\_)/(x\_), x\_Symbol] := Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

#### Rule 2394

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_))^(n\_)])\*(b\_)/((f\_) + (g\_)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

#### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rubi steps

$$\begin{aligned}
\int \frac{(132c + 132dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ag + bgx)^2} dx &= \int \left( \frac{2299968d^2(3bc - 2ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3g^2} + \frac{2299968d^3x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^4g^2} \right) dx \\
&= \frac{(2299968d^3) \int x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx}{b^2g^2} + \frac{(2299968d^2(3bc - 2ad)) \int \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx}{b^4g^2} \\
&= \frac{2299968Ad^2(3bc - 2ad)x}{b^3g^2} + \frac{1149984d^3x^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g^2} - \frac{2299968Bd^2(3bc - 2ad)(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^4g^2} \\
&= \frac{2299968Ad^2(3bc - 2ad)x}{b^3g^2} + \frac{2299968Bd^2(3bc - 2ad)(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^4g^2} \\
&= \frac{2299968Ad^2(3bc - 2ad)x}{b^3g^2} + \frac{2299968Bd^2(3bc - 2ad)(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^4g^2} \\
&= \frac{2299968Ad^2(3bc - 2ad)x}{b^3g^2} - \frac{1149984Bd^2(bc - ad)nx}{b^3g^2} - \frac{2299968B(bc - ad)(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^4g^2} \\
&= \frac{2299968Ad^2(3bc - 2ad)x}{b^3g^2} - \frac{1149984Bd^2(bc - ad)nx}{b^3g^2} - \frac{2299968B(bc - ad)(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^4g^2} \\
&= \frac{2299968Ad^2(3bc - 2ad)x}{b^3g^2} - \frac{1149984Bd^2(bc - ad)nx}{b^3g^2} - \frac{2299968B(bc - ad)(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^4g^2}
\end{aligned}$$

**Mathematica [A]** time = 0.41922, size = 394, normalized size = 1.01

$$i^3 \left( -3Bdn(bc - ad)^2 \left( \log(a + bx) \left( \log(a + bx) - 2 \log\left(\frac{b(c+dx)}{bc-ad}\right) \right) - 2 \text{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) \right) - a^2 B d^3 n \log(a + bx) + b^2 d^3 x \right)$$


---

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(a\*g + b\*g\*x)^2,x]

[Out] (i^3\*(2\*A\*b\*d^2\*(3\*b\*c - 2\*a\*d)\*x - b\*B\*d^2\*(b\*c - a\*d)\*n\*x - (2\*B\*(b\*c - a\*d)^3\*n)/(a + b\*x) - a^2\*B\*d^3\*n\*Log[a + b\*x] - 2\*B\*d\*(b\*c - a\*d)^2\*n\*Log[a + b\*x] + 2\*B\*d^2\*(3\*b\*c - 2\*a\*d)\*(a + b\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n] + b^2\*d^3\*x^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - (2\*(b\*c - a\*d)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(a + b\*x) + 6\*d\*(b\*c - a\*d)^2\*Log[a + b\*x]\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + b^2\*B\*c^2\*d\*n\*Log[c + d\*x] + 2\*B\*d\*(b\*c - a\*d)^2\*n\*Log[c + d\*x] - 2\*B\*d\*(-(b\*c) + a\*d)\*(-3\*b\*c + 2\*a\*d)\*n\*Log[c + d\*x] - 3\*B\*d\*(b\*c - a\*d)^2\*n\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]) - 2\*PolyLog[2, (d\*(a + b\*x))/(-(b\*c) + a\*d)])))/(2\*b^4\*g^2)

---

**Maple [F]** time = 0.699, size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3}{(bgx + ag)^2} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(((d\*i\*x+c\*i)^3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n)))/(b\*g\*x+a\*g)^2,x)

[Out] int(((d\*i\*x+c\*i)^3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n)))/(b\*g\*x+a\*g)^2,x)

---

**Maxima [B]** time = 2.76488, size = 2410, normalized size = 6.18

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^2,x, algorithm="maxima")

[Out] 
$$-B*c^3*i^3*n*(1/(b^2*g^2*x + a*b*g^2) + d*\log(b*x + a)/((b^2*c - a*b*d)*g^2) - d*\log(d*x + c)/((b^2*c - a*b*d)*g^2)) - 3*A*(a^2/(b^4*g^2*x + a*b^3*g^2) - x/(b^2*g^2) + 2*a*\log(b*x + a)/(b^3*g^2))*c*d^2*i^3 + 1/2*(2*a^3/(b^5*g^2*x + a*b^4*g^2) + 6*a^2*\log(b*x + a)/(b^4*g^2) + (b*x^2 - 4*a*x)/(b^3*g^2))*A*d^3*i^3 + 3*A*c^2*d*i^3*(a/(b^3*g^2*x + a*b^2*g^2) + \log(b*x + a)/(b^2*g^2)) - B*c^3*i^3*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^2*g^2*x + a*b*g^2) - A*c^3*i^3/(b^2*g^2*x + a*b*g^2) - 1/2*(5*b^3*c^3*d*i^3*n - 3*a*b^2*c^2*d^2*i^3*n - 2*a^2*b*c*d^3*i^3*n + 2*a^3*d^4*i^3*n)*B*\log(d*x + c)/(b^5*c*g^2 - a*b^4*d*g^2) + 1/2*((b^4*c*d^3*i^3*\log(e) - a*b^3*d^4*i^3*\log(e))*B*x^3 - ((i^3*n - 6*i^3*\log(e))*b^4*c^2*d^2 - (2*i^3*n - 9*i^3*\log(e))*a*b^3*c*d^3 + (i^3*n - 3*i^3*\log(e))*a^2*b^2*d^4)*B*x^2 - ((i^3*n - 6*i^3*\log(e))*a*b^3*c^2*d^2 - 2*(i^3*n - 5*i^3*\log(e))*a^2*b^2*c*d^3 + (i^3*n - 4*i^3*\log(e))*a^3*b*d^4)*B*x - 3*((b^4*c^3*d*i^3*n - 3*a*b^3*c^2*d^2*i^3*n + 3*a^2*b^2*c*d^3*i^3*n - a^3*b*d^4*i^3*n)*B*x + (a*b^3*c^3*d*i^3*n - 3*a^2*b^2*c^2*d^2*i^3*n + 3*a^3*b*c*d^3*i^3*n - a^4*d^4*i^3*n)*B)*\log(b*x + a)^2 + 2*(3*(i^3*n + i^3*\log(e))*a*b^3*c^3*d - 6*(i^3*n + i^3*\log(e))*a^2*b^2*c^2*d^2 + 4*(i^3*n + i^3*\log(e))*a^3*b*c*d^3 - (i^3*n + i^3*\log(e))*a^4*d^4)*B + ((6*b^4*c^3*d*i^3*\log(e) + 6*(2*i^3*n - 3*i^3*\log(e))*a*b^3*c^2*d^2 - (17*i^3*n - 18*i^3*\log(e))*a^2*b^2*c*d^3 + (7*i^3*n - 6*i^3*\log(e))*a^3*b*d^4)*B*x + (6*a*b^3*c^3*d*i^3*\log(e) + 6*(2*i^3*n - 3*i^3*\log(e))*a^2*b^2*c^2*d^2 - (17*i^3*n - 18*i^3*\log(e))*a^3*b*c*d^3 + (7*i^3*n - 6*i^3*\log(e))*a^4*d^4)*B)*\log(b*x + a) + ((b^4*c*d^3*i^3 - a*b^3*d^4*i^3)*B*x^3 + 3*(2*b^4*c^2*d^2*i^3 - 3*a*b^3*c*d^3*i^3 + a^2*b^2*d^4*i^3)*B*x^2 + 2*(3*a*b^3*c^2*d^2*i^3 - 5*a^2*b^2*c*d^3*i^3 + 2*a^3*b*d^4*i^3)*B*x + 2*(3*a*b^3*c^3*d*i^3 - 6*a^2*b^2*c^2*d^2*i^3 + 4*a^3*b*c*d^3*i^3 - a^4*d^4*i^3)*B + 6*((b^4*c^3*d*i^3 - 3*a*b^3*c^2*d^2*i^3 + 3*a^2*b^2*c*d^3*i^3 - a^3*b*d^4*i^3)*B*x + (a*b^3*c^3*d*i^3 - 3*a^2*b^2*c^2*d^2*i^3 + 3*a^3*b*c*d^3*i^3 - a^4*d^4*i^3)*B)*\log(b*x + a))*\log((b*x + a)^n) - ((b^4*c*d^3*i^3 - a*b^3*d^4*i^3)*B*x^3 + 3*(2*b^4*c^2*d^2*i^3 - 3*a*b^3*c*d^3*i^3 + a^2*b^2*d^4*i^3)*B*x^2 + 2*(3*a*b^3*c^2*d^2*i^3 - 5*a^2*b^2*c*d^3*i^3 + 2*a^3*b*d^4*i^3)*B*x + 2*(3*a*b^3*c^3*d*i^3 - 6*a^2*b^2*c^2*d^2*i^3 + 4*a^3*b*c*d^3*i^3 - a^4*d^4*i^3)*B + 6*((b^4*c^3*d*i^3 - 3*a*b^3*c^2*d^2*i^3 + 3*a^2*b^2*c*d^3*i^3 - a^3*b*d^4*i^3)*B*x + (a*b^3*c^3*d*i^3 - 3*a^2*b^2*c^2*d^2*i^3 + 3*a^3*b*c*d^3*i^3 - a^4*d^4*i^3)*B)*\log(b*x + a))*\log((d*x + c)^n)/(a*b^5*c*g^2 - a^2*b^4*d*g^2 + (b^6*c*g^2 - a*b^5*d*g^2)*x) + 3*(b^2*c^2*d*i^3*n - 2*a*b*c*d^2*i^3*n + a^2*d^3*i^3*n)*(\log(b*x + a)*\log((b*d*x + a*d)/(b*c - a*d) + 1) + \operatorname{dilog}(-(b*d*x + a*d)/(b*c - a*d)))*B/(b^4*g^2)$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{Ad^3i^3x^3 + 3Acd^2i^3x^2 + 3Ac^2di^3x + Ac^3i^3 + \left( Bd^3i^3x^3 + 3Bcd^2i^3x^2 + 3Bc^2di^3x + Bc^3i^3 \right) \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right)}{b^2g^2x^2 + 2abg^2x + a^2g^2}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^2,x, algorithm="fricas")

[Out] integral((A\*d^3\*i^3\*x^3 + 3\*A\*c\*d^2\*i^3\*x^2 + 3\*A\*c^2\*d\*i^3\*x + A\*c^3\*i^3 + (B\*d^3\*i^3\*x^3 + 3\*B\*c\*d^2\*i^3\*x^2 + 3\*B\*c^2\*d\*i^3\*x + B\*c^3\*i^3)\*log(e\*((b\*x + a)/(d\*x + c))^n))/(b^2\*g^2\*x^2 + 2\*a\*b\*g^2\*x + a^2\*g^2), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*\*3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n))/(b\*g\*x+a\*g)\*\*2,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3 \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)}{(bgx + ag)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^2,x, algorithm="giac")

[Out] integrate((d\*i\*x + c\*i)^3\*(B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)/(b\*g\*x + a\*g)^2, x)

$$3.133 \quad \int \frac{(ci+dx)^3 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ag+bgx)^3} dx$$

**Optimal.** Leaf size=361

$$\frac{3Bd^2i^3n(bc-ad)\text{PolyLog}\left(2, \frac{b(c+dx)}{d(a+bx)}\right)}{b^4g^3} + \frac{d^3i^3(a+bx)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{b^4g^3} - \frac{3d^2i^3(bc-ad)\log\left(1 - \frac{b(c+dx)}{d(a+bx)}\right)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{b^4g^3}$$

[Out]  $(-2*B*d*(b*c - a*d)*i^3*n*(c + d*x))/(b^3*g^3*(a + b*x)) - (B*(b*c - a*d)*i^3*n*(c + d*x)^2)/(4*b^2*g^3*(a + b*x)^2) + (d^3*i^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^4*g^3) - (2*d*(b*c - a*d)*i^3*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^3*g^3*(a + b*x)) - ((b*c - a*d)*i^3*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*b^2*g^3*(a + b*x)^2) - (B*d^2*(b*c - a*d)*i^3*n*Log[c + d*x])/(b^4*g^3) - (3*d^2*(b*c - a*d)*i^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^3) + (3*B*d^2*(b*c - a*d)*i^3*n*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^3)$

**Rubi [A]** time = 0.708683, antiderivative size = 461, normalized size of antiderivative = 1.28, number of steps used = 21, number of rules used = 13, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.302$ , Rules used = {2528, 2486, 31, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{3Bd^2i^3n(bc-ad)\text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{b^4g^3} + \frac{3d^2i^3(bc-ad)\log(a+bx)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{b^4g^3} - \frac{3di^3(bc-ad)^2\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{b^4g^3(a+bx)}$$

Antiderivative was successfully verified.

[In] Int[((c\*i + d\*i\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(a\*g + b\*g\*x)^3, x]

[Out]  $(A*d^3*i^3*x)/(b^3*g^3) - (B*(b*c - a*d)^3*i^3*n)/(4*b^4*g^3*(a + b*x)^2) - (5*B*d*(b*c - a*d)^2*i^3*n)/(2*b^4*g^3*(a + b*x)) - (5*B*d^2*(b*c - a*d)*i^3*n*Log[a + b*x])/(2*b^4*g^3) - (3*B*d^2*(b*c - a*d)*i^3*n*Log[a + b*x]^2)/(2*b^4*g^3) + (B*d^3*i^3*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(b^4*g^3) - ((b*c - a*d)^3*i^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*b^4*g^3*(a + b*x)^2) - (3*d*(b*c - a*d)^2*i^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^4*g^3*(a + b*x)) + (3*d^2*(b*c - a*d)*i^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^4*g^3) + (3*B*d^2*(b*c - a*d)*i^3*n*Log[c + d*x])/(2*b^4*g^3) + (3*B*d^2*(b*c - a*d)*i^3*n*Log[a + b*x]*Log[(b*(c + d*x))])/(2*b^4*g^3)$

$$\frac{1}{(b*c - a*d)} \frac{1}{(b^4*g^3)} + (3*B*d^2*(b*c - a*d)*i^{3*n}*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))]) \frac{1}{(b^4*g^3)}$$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x] }, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] := Simp[ ((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s - 1/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

### Rule 31

```
Int[((a_) + (b_.)*(x_))^(n_), x_Symbol] := Simp[Log[RemoveContent[a + b*x, x]]/b, x] /; FreeQ[{a, b}, x]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[ ((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFX^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFX_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFX, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFX, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))])*(b_.)/((f_.) + (g_.)*(x_)), x_Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```



Rubi steps

$$\begin{aligned}
\int \frac{(133c + 133dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ag + bgx)^3} dx &= \int \left( \frac{2352637d^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3g^3} + \frac{2352637(bc - ad)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3g^3(a + bx)} \right) dx \\
&= \frac{(2352637d^3) \int \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx}{b^3g^3} + \frac{(7057911d^2(bc - ad)) \int \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx}{b^3g^3} \\
&= \frac{2352637Ad^3x}{b^3g^3} - \frac{2352637(bc - ad)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{2b^4g^3(a + bx)^2} - \frac{7057911d^2(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3g^3} \\
&= \frac{2352637Ad^3x}{b^3g^3} + \frac{2352637Bd^3(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^4g^3} - \frac{2352637(bc - ad)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{2b^4g^3(a + bx)^2} \\
&= \frac{2352637Ad^3x}{b^3g^3} + \frac{2352637Bd^3(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^4g^3} - \frac{2352637(bc - ad)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{2b^4g^3(a + bx)^2} \\
&= \frac{2352637Ad^3x}{b^3g^3} - \frac{2352637B(bc - ad)^3n}{4b^4g^3(a + bx)^2} - \frac{11763185Bd(bc - ad)^2n}{2b^4g^3(a + bx)} - \frac{2352637(bc - ad)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{2b^4g^3(a + bx)^2} \\
&= \frac{2352637Ad^3x}{b^3g^3} - \frac{2352637B(bc - ad)^3n}{4b^4g^3(a + bx)^2} - \frac{11763185Bd(bc - ad)^2n}{2b^4g^3(a + bx)} - \frac{2352637(bc - ad)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{2b^4g^3(a + bx)^2} \\
&= \frac{2352637Ad^3x}{b^3g^3} - \frac{2352637B(bc - ad)^3n}{4b^4g^3(a + bx)^2} - \frac{11763185Bd(bc - ad)^2n}{2b^4g^3(a + bx)} - \frac{2352637(bc - ad)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{2b^4g^3(a + bx)^2}
\end{aligned}$$

**Mathematica [A]** time = 0.455893, size = 331, normalized size = 0.92

$$i^3 \left( 6Bd^2n(ad - bc) \left( \log(a + bx) \left( \log(a + bx) - 2 \log \left( \frac{b(c+dx)}{bc-ad} \right) \right) - 2 \text{PolyLog} \left( 2, \frac{d(a+bx)}{ad-bc} \right) \right) + 12d^2(bc - ad) \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) \right)$$

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(a\*g + b\*g\*x)^3,x]

```
[Out] (i^3*(4*A*b*d^3*x - (B*(b*c - a*d)^3*n)/(a + b*x)^2 - (10*B*d*(b*c - a*d)^2
*n)/(a + b*x) + 10*B*d^2*(-(b*c) + a*d)*n*Log[a + b*x] + 4*B*d^3*(a + b*x)*
Log[e*((a + b*x)/(c + d*x))^n] - (2*(b*c - a*d)^3*(A + B*Log[e*((a + b*x)/(
c + d*x))^n]))/(a + b*x)^2 - (12*d*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c
+ d*x))^n]))/(a + b*x) + 12*d^2*(b*c - a*d)*Log[a + b*x]*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n]) + 6*B*d^2*(b*c - a*d)*n*Log[c + d*x] + 6*B*d^2*(-(b*c
) + a*d)*n*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]))
- 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]))/(4*b^4*g^3)
```

**Maple [F]** time = 0.688, size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3}{(bgx + ag)^3} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x)
```

```
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x)
```

**Maxima [B]** time = 3.0288, size = 3707, normalized size = 10.27

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x, a
lgorithm="maxima")
```

```
[Out] -3/4*B*c^2*d*i^3*n*((3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*d)*x)/((b^5*c - a*b
^4*d)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)*g^3
) + 2*(2*b*c*d - a*d^2)*log(b*x + a)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)
*g^3) - 2*(2*b*c*d - a*d^2)*log(d*x + c)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*
d^2)*g^3)) + 1/4*B*c^3*i^3*n*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^
3*x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + 2*d^2*
log(b*x + a)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)
/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3)) - 1/2*A*d^3*i^3*((6*a^2*b*x + 5
*a^3)/(b^6*g^3*x^2 + 2*a*b^5*g^3*x + a^2*b^4*g^3) - 2*x/(b^3*g^3) + 6*a*log
(b*x + a)/(b^4*g^3)) + 3/2*A*c*d^2*i^3*((4*a*b*x + 3*a^2)/(b^5*g^3*x^2 + 2*
```

$$\begin{aligned}
& a*b^4*g^3*x + a^2*b^3*g^3) + 2*\log(b*x + a)/(b^3*g^3) - 3/2*(2*b*x + a)*B* \\
& c^2*d*i^3*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^4*g^3*x^2 + 2*a*b^3*g^3 \\
& *x + a^2*b^2*g^3) - 3/2*(2*b*x + a)*A*c^2*d*i^3/(b^4*g^3*x^2 + 2*a*b^3*g^3* \\
& x + a^2*b^2*g^3) - 1/2*B*c^3*i^3*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^ \\
& 3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) - 1/2*A*c^3*i^3/(b^3*g^3*x^2 + 2*a*b \\
& ^2*g^3*x + a^2*b*g^3) - 1/2*(2*b^3*c^3*d^2*i^3*n + 8*a*b^2*c^2*d^3*i^3*n - \\
& 13*a^2*b*c*d^4*i^3*n + 5*a^3*d^5*i^3*n)*B*\log(d*x + c)/(b^6*c^2*g^3 - 2*a*b \\
& ^5*c*d*g^3 + a^2*b^4*d^2*g^3) + 1/4*(4*(b^5*c^2*d^3*i^3*\log(e) - 2*a*b^4*c \\
& d^4*i^3*\log(e) + a^2*b^3*d^5*i^3*\log(e))*B*x^3 + 8*(a*b^4*c^2*d^3*i^3*\log(e) \\
& ) - 2*a^2*b^3*c*d^4*i^3*\log(e) + a^3*b^2*d^5*i^3*\log(e))*B*x^2 + 2*(12*(i^3 \\
& *n + i^3*\log(e))*a*b^4*c^3*d^2 - (27*i^3*n + 28*i^3*\log(e))*a^2*b^3*c^2*d^3 \\
& + 20*(i^3*n + i^3*\log(e))*a^3*b^2*c*d^4 - (5*i^3*n + 4*i^3*\log(e))*a^4*b*d \\
& ^5)*B*x - 6*((b^5*c^3*d^2*i^3*n - 3*a*b^4*c^2*d^3*i^3*n + 3*a^2*b^3*c*d^4*i \\
& ^3*n - a^3*b^2*d^5*i^3*n)*B*x^2 + 2*(a*b^4*c^3*d^2*i^3*n - 3*a^2*b^3*c^2*d^ \\
& 3*i^3*n + 3*a^3*b^2*c*d^4*i^3*n - a^4*b*d^5*i^3*n)*B*x + (a^2*b^3*c^3*d^2*i \\
& ^3*n - 3*a^3*b^2*c^2*d^3*i^3*n + 3*a^4*b*c*d^4*i^3*n - a^5*d^5*i^3*n)*B)*\lo \\
& g(b*x + a)^2 + (3*(7*i^3*n + 6*i^3*\log(e))*a^2*b^3*c^3*d^2 - (47*i^3*n + 46 \\
& *i^3*\log(e))*a^3*b^2*c^2*d^3 + (35*i^3*n + 38*i^3*\log(e))*a^4*b*c*d^4 - (9* \\
& i^3*n + 10*i^3*\log(e))*a^5*d^5)*B + 2*((6*b^5*c^3*d^2*i^3*\log(e) + 2*(7*i^3 \\
& *n - 9*i^3*\log(e))*a*b^4*c^2*d^3 - (19*i^3*n - 18*i^3*\log(e))*a^2*b^3*c*d^4 \\
& + (7*i^3*n - 6*i^3*\log(e))*a^3*b^2*d^5)*B*x^2 + 2*(6*a*b^4*c^3*d^2*i^3*\log \\
& (e) + 2*(7*i^3*n - 9*i^3*\log(e))*a^2*b^3*c^2*d^3 - (19*i^3*n - 18*i^3*\log(e) \\
& ))*a^3*b^2*c*d^4 + (7*i^3*n - 6*i^3*\log(e))*a^4*b*d^5)*B*x + (6*a^2*b^3*c^3 \\
& *d^2*i^3*\log(e) + 2*(7*i^3*n - 9*i^3*\log(e))*a^3*b^2*c^2*d^3 - (19*i^3*n - \\
& 18*i^3*\log(e))*a^4*b*c*d^4 + (7*i^3*n - 6*i^3*\log(e))*a^5*d^5)*B)*\log(b*x + \\
& a) + 2*(2*(b^5*c^2*d^3*i^3 - 2*a*b^4*c*d^4*i^3 + a^2*b^3*d^5*i^3)*B*x^3 + \\
& 4*(a*b^4*c^2*d^3*i^3 - 2*a^2*b^3*c*d^4*i^3 + a^3*b^2*d^5*i^3)*B*x^2 + 4*(3* \\
& a*b^4*c^3*d^2*i^3 - 7*a^2*b^3*c^2*d^3*i^3 + 5*a^3*b^2*c*d^4*i^3 - a^4*b*d^5 \\
& *i^3)*B*x + (9*a^2*b^3*c^3*d^2*i^3 - 23*a^3*b^2*c^2*d^3*i^3 + 19*a^4*b*c*d^ \\
& 4*i^3 - 5*a^5*d^5*i^3)*B + 6*((b^5*c^3*d^2*i^3 - 3*a*b^4*c^2*d^3*i^3 + 3*a^ \\
& 2*b^3*c*d^4*i^3 - a^3*b^2*d^5*i^3)*B*x^2 + 2*(a*b^4*c^3*d^2*i^3 - 3*a^2*b^3 \\
& *c^2*d^3*i^3 + 3*a^3*b^2*c*d^4*i^3 - a^4*b*d^5*i^3)*B*x + (a^2*b^3*c^3*d^2* \\
& i^3 - 3*a^3*b^2*c^2*d^3*i^3 + 3*a^4*b*c*d^4*i^3 - a^5*d^5*i^3)*B)*\log(b*x + \\
& a))*\log((b*x + a)^n) - 2*(2*(b^5*c^2*d^3*i^3 - 2*a*b^4*c*d^4*i^3 + a^2*b^3 \\
& *d^5*i^3)*B*x^3 + 4*(a*b^4*c^2*d^3*i^3 - 2*a^2*b^3*c*d^4*i^3 + a^3*b^2*d^5* \\
& i^3)*B*x^2 + 4*(3*a*b^4*c^3*d^2*i^3 - 7*a^2*b^3*c^2*d^3*i^3 + 5*a^3*b^2*c*d \\
& ^4*i^3 - a^4*b*d^5*i^3)*B*x + (9*a^2*b^3*c^3*d^2*i^3 - 23*a^3*b^2*c^2*d^3*i \\
& ^3 + 19*a^4*b*c*d^4*i^3 - 5*a^5*d^5*i^3)*B + 6*((b^5*c^3*d^2*i^3 - 3*a*b^4* \\
& c^2*d^3*i^3 + 3*a^2*b^3*c*d^4*i^3 - a^3*b^2*d^5*i^3)*B*x^2 + 2*(a*b^4*c^3*d \\
& ^2*i^3 - 3*a^2*b^3*c^2*d^3*i^3 + 3*a^3*b^2*c*d^4*i^3 - a^4*b*d^5*i^3)*B*x + \\
& (a^2*b^3*c^3*d^2*i^3 - 3*a^3*b^2*c^2*d^3*i^3 + 3*a^4*b*c*d^4*i^3 - a^5*d^5 \\
& *i^3)*B)*\log(b*x + a))*\log((d*x + c)^n))/(a^2*b^6*c^2*g^3 - 2*a^3*b^5*c*d*g \\
& ^3 + a^4*b^4*d^2*g^3 + (b^8*c^2*g^3 - 2*a*b^7*c*d*g^3 + a^2*b^6*d^2*g^3)*x^ \\
& 2 + 2*(a*b^7*c^2*g^3 - 2*a^2*b^6*c*d*g^3 + a^3*b^5*d^2*g^3)*x) + 3*(b*c*d^2 \\
& *i^3*n - a*d^3*i^3*n)*(\log(b*x + a)*\log((b*d*x + a*d)/(b*c - a*d) + 1) + di
\end{aligned}$$

$\log(-(b*d*x + a*d)/(b*c - a*d))*B/(b^4*g^3)$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{Ad^3i^3x^3 + 3Acd^2i^3x^2 + 3Ac^2di^3x + Ac^3i^3 + \left( Bd^3i^3x^3 + 3Bcd^2i^3x^2 + 3Bc^2di^3x + Bc^3i^3 \right) \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right)}{b^3g^3x^3 + 3ab^2g^3x^2 + 3a^2bg^3x + a^3g^3}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^3,x, algorithm="fricas")

[Out] integral((A\*d^3\*i^3\*x^3 + 3\*A\*c\*d^2\*i^3\*x^2 + 3\*A\*c^2\*d\*i^3\*x + A\*c^3\*i^3 + (B\*d^3\*i^3\*x^3 + 3\*B\*c\*d^2\*i^3\*x^2 + 3\*B\*c^2\*d\*i^3\*x + B\*c^3\*i^3)\*log(e\*((b\*x + a)/(d\*x + c))^n))/(b^3\*g^3\*x^3 + 3\*a\*b^2\*g^3\*x^2 + 3\*a^2\*b\*g^3\*x + a^3\*g^3), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*\*3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n))/(b\*g\*x+a\*g)\*\*3,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3 \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)}{(bgx + ag)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x, algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)/(b*g*x + a*g)^3, x)
```

$$3.134 \quad \int \frac{(ci+dx)^3 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ag+bgx)^4} dx$$

**Optimal.** Leaf size=326

$$\frac{Bd^3i^3n \text{PolyLog} \left( 2, \frac{b(c+dx)}{d(a+bx)} \right)}{b^4g^4} - \frac{d^2i^3(c+dx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{b^3g^4(a+bx)} - \frac{d^3i^3 \log \left( 1 - \frac{b(c+dx)}{d(a+bx)} \right) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{b^4g^4} - \frac{di^3}{b^4g^4}$$

[Out]  $-\left(\frac{Bd^2i^3n(c+dx)}{b^3g^4(a+bx)}\right) - \frac{(Bd^2i^3n(c+dx)^2)}{(4*b^2g^4(a+bx)^2)} - \frac{(Bd^3i^3n(c+dx)^3)}{(9*b^3g^4(a+bx)^3)} - \frac{(d^2i^3(c+dx)*(A+B*Log[e*((a+bx)/(c+dx))^n])}{(b^3g^4(a+bx))} - \frac{(d^2i^3(c+dx)^2*(A+B*Log[e*((a+bx)/(c+dx))^n])}{(2*b^2g^4(a+bx)^2)} - \frac{(i^3(c+dx)^3*(A+B*Log[e*((a+bx)/(c+dx))^n])}{(3*b^3g^4(a+bx)^3)} - \frac{(d^3i^3*(A+B*Log[e*((a+bx)/(c+dx))^n])*Log[1-(b*(c+dx))/(d*(a+bx))]}{(b^4g^4)} + \frac{(Bd^3i^3n*PolyLog[2, (b*(c+dx))/(d*(a+bx))])}{(b^4g^4)}$

**Rubi [A]** time = 0.794242, antiderivative size = 444, normalized size of antiderivative = 1.36, number of steps used = 22, number of rules used = 11, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.256$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{Bd^3i^3n \text{PolyLog} \left( 2, -\frac{d(a+bx)}{bc-ad} \right)}{b^4g^4} + \frac{d^3i^3 \log(a+bx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{b^4g^4} - \frac{3d^2i^3(bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{b^4g^4(a+bx)} - \frac{3di^3}{b^4g^4}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[\frac{(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])}{(a*g + b*g*x)^4}, x]$

[Out]  $-\frac{(B*(b*c - a*d)^3*i^3*n)}{(9*b^4g^4(a+bx)^3)} - \frac{(7*B*d*(b*c - a*d)^2*i^3*n)}{(12*b^4g^4(a+bx)^2)} - \frac{(11*B*d^2*(b*c - a*d)*i^3*n)}{(6*b^4g^4(a+bx))} - \frac{(11*B*d^3*i^3*n*Log[a+bx])}{(6*b^4g^4)} - \frac{(B*d^3*i^3*n*Log[a+bx]^2)}{(2*b^4g^4)} - \frac{((b*c - a*d)^3*i^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])}{(3*b^4g^4(a+bx)^3)} - \frac{(3*d*(b*c - a*d)^2*i^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])}{(2*b^4g^4(a+bx)^2)} - \frac{(3*d^2*(b*c - a*d)*i^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])}{(b^4g^4(a+bx))} + \frac{(d^3*i^3*Log[a+bx]*(A + B*Log[e*((a + b*x)/(c + d*x))^n])}{(b^4g^4)} + \frac{(11*B*d^3*i^3*n*Log[c + d*x])}{(6*b^4g^4)} + \frac{(B*d^3*i^3*n*Log[a+bx]*Log[(b*(c + d*x))/(b*c - a*d)])}{(b^4g^4)} + \frac{(B*d^3*i^3*n*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))]}{(b^4g^4)}$

$^4g^4$ )

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(Rfx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, Rfx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
Rfx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x
), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps



$$\begin{aligned}
\int \frac{(134c + 134dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ag + bgx)^4} dx &= \int \left( \frac{2406104(bc - ad)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3 g^4 (a + bx)^4} + \frac{7218312d(bc - ad)^2}{b^3 g^4} \right) dx \\
&= \frac{(2406104d^3) \int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{a+bx} dx}{b^3 g^4} + \frac{(7218312d^2(bc - ad)) \int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{(a+bx)} dx}{b^3 g^4} \\
&= -\frac{2406104(bc - ad)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3b^4 g^4 (a + bx)^3} - \frac{3609156d(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^4 g^4 (a + bx)^2} \\
&= -\frac{2406104(bc - ad)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3b^4 g^4 (a + bx)^3} - \frac{3609156d(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^4 g^4 (a + bx)^2} \\
&= -\frac{2406104(bc - ad)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3b^4 g^4 (a + bx)^3} - \frac{3609156d(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^4 g^4 (a + bx)^2} \\
&= -\frac{2406104B(bc - ad)^3 n}{9b^4 g^4 (a + bx)^3} - \frac{4210682Bd(bc - ad)^2 n}{3b^4 g^4 (a + bx)^2} - \frac{13233572Bd^2(bc - ad)n}{3b^4 g^4 (a + bx)} \\
&= -\frac{2406104B(bc - ad)^3 n}{9b^4 g^4 (a + bx)^3} - \frac{4210682Bd(bc - ad)^2 n}{3b^4 g^4 (a + bx)^2} - \frac{13233572Bd^2(bc - ad)n}{3b^4 g^4 (a + bx)} \\
&= -\frac{2406104B(bc - ad)^3 n}{9b^4 g^4 (a + bx)^3} - \frac{4210682Bd(bc - ad)^2 n}{3b^4 g^4 (a + bx)^2} - \frac{13233572Bd^2(bc - ad)n}{3b^4 g^4 (a + bx)}
\end{aligned}$$

**Mathematica [A]** time = 0.510102, size = 326, normalized size = 1.

$$i^3 \left( -18Bd^3 n \left( \log(a + bx) \left( \log(a + bx) - 2 \log \left( \frac{b(c+dx)}{bc-ad} \right) \right) - 2 \text{PolyLog} \left( 2, \frac{d(a+bx)}{ad-bc} \right) \right) + 36d^3 \log(a + bx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) \right)$$

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(a\*g + b\*g\*x)^4, x]

```
[Out] (i^3*((-4*B*(b*c - a*d)^3*n)/(a + b*x)^3 - (21*B*d*(b*c - a*d)^2*n)/(a + b*x)^2 + (66*B*d^2*(-(b*c) + a*d)*n)/(a + b*x) - 66*B*d^3*n*Log[a + b*x] - (12*(b*c - a*d)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x)^3 - (54*d*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x)^2 + (108*d^2*(-(b*c) + a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x) + 36*d^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 66*B*d^3*n*Log[c + d*x] - 18*B*d^3*n*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/(36*b^4*g^4)
```

**Maple [F]** time = 0.688, size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3}{(bgx + ag)^4} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x)
```

```
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x)
```

**Maxima [F]** time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x, algorithm="maxima")
```

```
[Out] -1/6*B*c*d^2*i^3*n*((11*a^2*b^2*c^2 - 7*a^3*b*c*d + 2*a^4*d^2 + 6*(3*b^4*c^2 - 3*a*b^3*c*d + a^2*b^2*d^2)*x)^2 + 3*(9*a*b^3*c^2 - 7*a^2*b^2*c*d + 2*a^3*b*d^2)*x)/(b^8*c^2 - 2*a*b^7*c*d + a^2*b^6*d^2)*g^4*x^3 + 3*(a*b^7*c^2 - 2*a^2*b^6*c*d + a^3*b^5*d^2)*g^4*x^2 + 3*(a^2*b^6*c^2 - 2*a^3*b^5*c*d + a^4*b^4*d^2)*g^4*x + (a^3*b^5*c^2 - 2*a^4*b^4*c*d + a^5*b^3*d^2)*g^4 + 6*(3*b^2*c^2*d - 3*a*b*c*d^2 + a^2*d^3)*log(b*x + a)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^4) - 6*(3*b^2*c^2*d - 3*a*b*c*d^2 + a^2*d^3)*log(d*x + c)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^4) - 1/18*B*c^3*i^3*n*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/(b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*
```

$$\begin{aligned}
& x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 \\
& - 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b \\
& *d^2)*g^4 + 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 \\
& - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b \\
& ^2*c*d^2 - a^3*b*d^3)*g^4) - 1/12*B*c^2*d*i^3*n*((5*a*b^2*c^2 - 22*a^2*b*c \\
& *d + 5*a^3*d^2 - 6*(3*b^3*c*d - a*b^2*d^2))*x^2 + 3*(3*b^3*c^2 - 16*a*b^2*c* \\
& d + 5*a^2*b*d^2)*x)/((b^7*c^2 - 2*a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3*(a*b \\
& ^6*c^2 - 2*a^2*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4* \\
& c*d + a^4*b^3*d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4) \\
& - 6*(3*b*c*d^2 - a*d^3)*log(b*x + a)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3 \\
& *c*d^2 - a^3*b^2*d^3)*g^4) + 6*(3*b*c*d^2 - a*d^3)*log(d*x + c)/((b^5*c^3 - \\
& 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4) + 1/6*A*d^3*i^3*((18* \\
& a*b^2*x^2 + 27*a^2*b*x + 11*a^3)/(b^7*g^4*x^3 + 3*a*b^6*g^4*x^2 + 3*a^2*b^5 \\
& *g^4*x + a^3*b^4*g^4) + 6*log(b*x + a)/(b^4*g^4)) + 1/6*B*d^3*i^3*((18*a*b \\
& ^2*x^2 + 27*a^2*b*x + 11*a^3 + 6*(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3)* \\
& log(b*x + a))*log((b*x + a)^n) - (18*a*b^2*x^2 + 27*a^2*b*x + 11*a^3 + 6*(b \\
& ^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3)*log(b*x + a))*log((d*x + c)^n))/(b^7 \\
& *g^4*x^3 + 3*a*b^6*g^4*x^2 + 3*a^2*b^5*g^4*x + a^3*b^4*g^4) + 6*integrate( \\
& 1/6*(6*b^4*d*x^4*log(e) + 6*b^4*c*x^3*log(e) - 11*a^3*b*c*n + 11*a^4*d*n - \\
& 18*(a*b^3*c*n - a^2*b^2*d*n))*x^2 - 27*(a^2*b^2*c*n - a^3*b*d*n)*x - 6*(a^3* \\
& b*c*n - a^4*d*n + (b^4*c*n - a*b^3*d*n))*x^3 + 3*(a*b^3*c*n - a^2*b^2*d*n)*x \\
& ^2 + 3*(a^2*b^2*c*n - a^3*b*d*n)*x)*log(b*x + a))/(b^8*d*g^4*x^5 + a^4*b^4* \\
& c*g^4 + (b^8*c*g^4 + 4*a*b^7*d*g^4)*x^4 + 2*(2*a*b^7*c*g^4 + 3*a^2*b^6*d*g^ \\
& 4)*x^3 + 2*(3*a^2*b^6*c*g^4 + 2*a^3*b^5*d*g^4)*x^2 + (4*a^3*b^5*c*g^4 + a^4 \\
& *b^4*d*g^4)*x), x) - 1/2*(3*b*x + a)*B*c^2*d*i^3*log(e*(b*x/(d*x + c) + a/ \\
& (d*x + c))^n)/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^ \\
& 4) - (3*b^2*x^2 + 3*a*b*x + a^2)*B*c*d^2*i^3*log(e*(b*x/(d*x + c) + a/(d*x \\
& + c))^n)/(b^6*g^4*x^3 + 3*a*b^5*g^4*x^2 + 3*a^2*b^4*g^4*x + a^3*b^3*g^4) - \\
& 1/2*(3*b*x + a)*A*c^2*d*i^3/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4* \\
& x + a^3*b^2*g^4) - (3*b^2*x^2 + 3*a*b*x + a^2)*A*c*d^2*i^3/(b^6*g^4*x^3 + 3 \\
& *a*b^5*g^4*x^2 + 3*a^2*b^4*g^4*x + a^3*b^3*g^4) - 1/3*B*c^3*i^3*log(e*(b*x/ \\
& (d*x + c) + a/(d*x + c))^n)/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4* \\
& x + a^3*b*g^4) - 1/3*A*c^3*i^3/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^ \\
& ^4*x + a^3*b*g^4)
\end{aligned}$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{Ad^3i^3x^3 + 3Acd^2i^3x^2 + 3Ac^2di^3x + Ac^3i^3 + (Bd^3i^3x^3 + 3Bcd^2i^3x^2 + 3Bc^2di^3x + Bc^3i^3) \log\left(e^{\left(\frac{bx+a}{dx+c}\right)^n}\right)}{b^4g^4x^4 + 4ab^3g^4x^3 + 6a^2b^2g^4x^2 + 4a^3bg^4x + a^4g^4}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x, a
lgorithm="fricas")
```

```
[Out] integral((A*d^3*i^3*x^3 + 3*A*c*d^2*i^3*x^2 + 3*A*c^2*d*i^3*x + A*c^3*i^3 +
(B*d^3*i^3*x^3 + 3*B*c*d^2*i^3*x^2 + 3*B*c^2*d*i^3*x + B*c^3*i^3)*log(e*((
b*x + a)/(d*x + c))^n))/(b^4*g^4*x^4 + 4*a*b^3*g^4*x^3 + 6*a^2*b^2*g^4*x^2
+ 4*a^3*b*g^4*x + a^4*g^4), x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))/(b*g*x+a*g)**4,x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3 \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)}{(bgx + ag)^4} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x, a
lgorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)/(b*g*x + a
*g)^4, x)
```

$$3.135 \quad \int \frac{(ag+bgx)^3 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{ci+dix} dx$$

**Optimal.** Leaf size=269

$$\frac{Bg^3n(bc-ad)^3 \text{PolyLog} \left( 2, \frac{d(a+bx)}{b(c+dx)} \right)}{d^4i} - \frac{g^3(a+bx)^2(bc-ad) \left( 3B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + 3A + Bn \right)}{6d^2i} + \frac{g^3(a+bx)(bc-ad)^2 (6B}{d^4i}$$

[Out]  $(g^3(a+bx)^3(A+B \text{Log}[e((a+bx)/(c+dx))^n]))/(3d^3i) - ((b^3c - a^3d)g^3(a+bx)^2(3A+Bn+3B \text{Log}[e((a+bx)/(c+dx))^n]))/(6d^2i) + ((b^3c - a^3d)^2g^3(a+bx)(6A+5Bn+6B \text{Log}[e((a+bx)/(c+dx))^n]))/(6d^3i) + ((b^3c - a^3d)^3g^3(6A+11Bn+6B \text{Log}[e((a+bx)/(c+dx))^n]) \text{Log}[(b^3c - a^3d)/(b(c+dx))])/(6d^4i) + (B(b^3c - a^3d)^3g^3n \text{PolyLog}[2, (d(a+bx))/(b(c+dx))])/(d^4i)$

**Rubi [A]** time = 0.645896, antiderivative size = 426, normalized size of antiderivative = 1.58, number of steps used = 22, number of rules used = 13, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.302$ , Rules used = {2528, 2486, 31, 2525, 12, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{Bg^3n(bc-ad)^3 \text{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right)}{d^4i} - \frac{g^3(a+bx)^2(bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{2d^2i} - \frac{g^3(bc-ad)^3 \log(ci+dix) \left( B \log \right)}{d^4i}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[(a^3g + b^3g^3x)^3(A+B \text{Log}[e((a+bx)/(c+dx))^n])/(c^3i + d^3ix), x]$

[Out]  $(A^3b^3(b^3c - a^3d)^2g^3x)/(d^3i) + (5^3b^3B^3(b^3c - a^3d)^2g^3n^3x)/(6d^3i) - (B^3(b^3c - a^3d)g^3n^3(a+bx)^2)/(6d^2i) + (B^3(b^3c - a^3d)^2g^3(a+bx) \text{Log}[e((a+bx)/(c+dx))^n])/(d^3i) - ((b^3c - a^3d)g^3(a+bx)^2(A+B \text{Log}[e((a+bx)/(c+dx))^n]))/(2d^2i) + (g^3(a+bx)^3(A+B \text{Log}[e((a+bx)/(c+dx))^n]))/(3d^3i) - (11^3B^3(b^3c - a^3d)^3g^3n^3 \text{Log}[c+dx])/(6d^4i) - (B^3(b^3c - a^3d)^3g^3n^3 \text{Log}[i(c+dx)]^2)/(2d^4i) + (B^3(b^3c - a^3d)^3g^3n^3 \text{Log}[-((d(a+bx))/(b^3c - a^3d))] \text{Log}[c^3i + d^3ix])/(d^4i) - ((b^3c - a^3d)^3g^3(A+B \text{Log}[e((a+bx)/(c+dx))^n]) \text{Log}[c^3i + d^3ix])/(d^4i) + (B^3(b^3c - a^3d)^3g^3n^3 \text{PolyLog}[2, (b^3(c+dx))/(b^3c - a^3d)])/(d^4i)$

**Rule 2528**

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.)
^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)
^q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q]^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

### Rule 31

```
Int[((a_) + (b_.)*(x_))^(n_), x_Symbol] := Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /;
```

FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

### Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*(RFx\_), x\_Symbol] :> With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n]^p, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]

### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :> Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n]))/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :> Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]/(x\_), x\_Symbol] :> -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_.) + (g\_.)\*(x\_))^(q\_.), x\_Symbol] :> Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_))^(n\_.)]\*(b\_.)/(x\_), x\_Symbol] :> Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rubi steps

$$\begin{aligned}
\int \frac{(ag + bgx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{135c + 135dx} dx &= \int \left( \frac{b(bc - ad)^2 g^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{135d^3} + \frac{(-bc + ad)^3 g^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{d^3(135c + 135dx)} \right) dx \\
&= \frac{(bg) \int (ag + bgx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx}{135d} - \frac{(b(bc - ad)g^2) \int (ag + bgx)}{135d} \\
&= \frac{Ab(bc - ad)^2 g^3 x}{135d^3} - \frac{(bc - ad)g^3 (a + bx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{270d^2} + \frac{g^3 (a + bx)}{135d} \\
&= \frac{Ab(bc - ad)^2 g^3 x}{135d^3} + \frac{B(bc - ad)^2 g^3 (a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{135d^3} - \frac{(bc - ad)g^3 (a + bx)}{135d} \\
&= \frac{Ab(bc - ad)^2 g^3 x}{135d^3} + \frac{B(bc - ad)^2 g^3 (a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{135d^3} - \frac{(bc - ad)g^3 (a + bx)}{135d} \\
&= \frac{Ab(bc - ad)^2 g^3 x}{135d^3} + \frac{bB(bc - ad)^2 g^3 nx}{162d^3} - \frac{B(bc - ad)g^3 n(a + bx)^2}{810d^2} + \frac{B(bc - ad)g^3 (a + bx)}{135d} \\
&= \frac{Ab(bc - ad)^2 g^3 x}{135d^3} + \frac{bB(bc - ad)^2 g^3 nx}{162d^3} - \frac{B(bc - ad)g^3 n(a + bx)^2}{810d^2} + \frac{B(bc - ad)g^3 (a + bx)}{135d} \\
&= \frac{Ab(bc - ad)^2 g^3 x}{135d^3} + \frac{bB(bc - ad)^2 g^3 nx}{162d^3} - \frac{B(bc - ad)g^3 n(a + bx)^2}{810d^2} + \frac{B(bc - ad)g^3 (a + bx)}{135d}
\end{aligned}$$

**Mathematica [A]** time = 0.277999, size = 370, normalized size = 1.38

$$\frac{g^3 \left( 3Bn(bc - ad)^3 \left( 2 \text{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right) + \log(i(c + dx)) \left( 2 \log \left( \frac{d(a+bx)}{ad-bc} \right) - \log(i(c + dx)) \right) \right) + 2d^3(a + bx)^3 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) \right)}{135d^3}$$

Antiderivative was successfully verified.

[In] Integrate[((a\*g + b\*g\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(c\*i + d\*i\*x), x]

[Out] (g^3\*(6\*A\*b\*d\*(b\*c - a\*d)^2\*x + 6\*B\*d\*(b\*c - a\*d)^2\*(a + b\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n] + 3\*d^2\*(-(b\*c) + a\*d)\*(a + b\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 2\*d^3\*(a + b\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(135\*d^3)



- 6\*B\*(b\*c - a\*d)^3\*n\*Log[c + d\*x] + B\*(b\*c - a\*d)\*n\*(2\*b\*d\*(b\*c - a\*d)\*x - d^2\*(a + b\*x)^2 - 2\*(b\*c - a\*d)^2\*Log[c + d\*x]) + 3\*B\*(b\*c - a\*d)^2\*n\*(b\*d\*x + (-(b\*c) + a\*d)\*Log[c + d\*x]) - 6\*(b\*c - a\*d)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[i\*(c + d\*x)] + 3\*B\*(b\*c - a\*d)^3\*n\*((2\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)] - Log[i\*(c + d\*x)])\*Log[i\*(c + d\*x)] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])))/(6\*d^4\*i)

**Maple [F]** time = 0.685, size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^3}{dix + ci} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i),x)

[Out] int((b\*g\*x+a\*g)^3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i),x)

**Maxima [B]** time = 2.76182, size = 1354, normalized size = 5.03

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i),x, algorithm="maxima")

[Out] 3\*A\*a^2\*b\*g^3\*(x/(d\*i) - c\*log(d\*x + c)/(d^2\*i)) - 1/6\*A\*b^3\*g^3\*(6\*c^3\*log(d\*x + c)/(d^4\*i) - (2\*d^2\*x^3 - 3\*c\*d\*x^2 + 6\*c^2\*x)/(d^3\*i)) + 3/2\*A\*a\*b^2\*g^3\*(2\*c^2\*log(d\*x + c)/(d^3\*i) + (d\*x^2 - 2\*c\*x)/(d^2\*i)) + A\*a^3\*g^3\*log(d\*i\*x + c\*i)/(d\*i) - (b^3\*c^3\*g^3\*n - 3\*a\*b^2\*c^2\*d\*g^3\*n + 3\*a^2\*b\*c\*d^2\*g^3\*n - a^3\*d^3\*g^3\*n)\*(log(b\*x + a)\*log((b\*d\*x + a\*d)/(b\*c - a\*d) + 1) + dilog(-(b\*d\*x + a\*d)/(b\*c - a\*d)))\*B/(d^4\*i) + 1/6\*(6\*a^3\*d^3\*g^3\*log(e) - (11\*g^3\*n + 6\*g^3\*log(e))\*b^3\*c^3 + 9\*(3\*g^3\*n + 2\*g^3\*log(e))\*a\*b^2\*c^2\*d - 18\*(g^3\*n + g^3\*log(e))\*a^2\*b\*c\*d^2)\*B\*log(d\*x + c)/(d^4\*i) + 1/6\*(2\*B\*b^3\*d^3\*g^3\*x^3\*log(e) - ((g^3\*n + 3\*g^3\*log(e))\*b^3\*c\*d^2 - (g^3\*n + 9\*g^3\*log(e))\*a\*b^2\*d^3)\*B\*x^2 + 6\*(b^3\*c^3\*g^3\*n - 3\*a\*b^2\*c^2\*d\*g^3\*n + 3\*a^2\*b\*c\*d^2\*g^3\*n - a^3\*d^3\*g^3\*n)\*B\*log(b\*x + a)\*log(d\*x + c) - 3\*(b^3\*c^3\*g^3\*n - 3\*a\*b^2\*c^2\*d\*g^3\*n + 3\*a^2\*b\*c\*d^2\*g^3\*n - a^3\*d^3\*g^3\*n)\*B\*log(d\*x + c

$$\begin{aligned} &)^2 + ((5g^3n + 6g^3\log(e))b^3c^2d - 6(2g^3n + 3g^3\log(e))ab^2 \\ &2c^2d^2 + (7g^3n + 18g^3\log(e))a^2b^2d^3)Bx + (6ab^2c^2d^3g^3n - \\ &15a^2b^2c^2d^2g^3n + 11a^3d^3g^3n)B\log(bx + a) + (2Bb^3d^3g^3 \\ &x^3 - 3(b^3c^2d^2g^3 - 3ab^2d^3g^3)Bx^2 + 6(b^3c^2d^2g^3 - 3ab^2 \\ &^2c^2d^2g^3 + 3a^2b^2d^3g^3)Bx - 6(b^3c^3g^3 - 3ab^2c^2d^2g^3 + \\ &3a^2b^2c^2d^2g^3 - a^3d^3g^3)B\log(dx + c))\log((bx + a)^n) - (2Bb^3 \\ &3d^3g^3x^3 - 3(b^3c^2d^2g^3 - 3ab^2d^3g^3)Bx^2 + 6(b^3c^2d^2g^3 \\ &3 - 3ab^2c^2d^2g^3 + 3a^2b^2d^3g^3)Bx - 6(b^3c^3g^3 - 3ab^2c^2 \\ &d^2g^3 + 3a^2b^2c^2d^2g^3 - a^3d^3g^3)B\log(dx + c))\log((dx + c)^n) \\ &/(d^4i) \end{aligned}$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{Ab^3g^3x^3 + 3Aab^2g^3x^2 + 3Aa^2bg^3x + Aa^3g^3 + (Bb^3g^3x^3 + 3Bab^2g^3x^2 + 3Ba^2bg^3x + Ba^3g^3) \log\left(e \left(\frac{bx+a}{dx+c}\right)^n\right)}{dix + ci} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i),x, algorithm="fricas")

[Out] integral((A\*b^3\*g^3\*x^3 + 3\*A\*a\*b^2\*g^3\*x^2 + 3\*A\*a^2\*b\*g^3\*x + A\*a^3\*g^3 + (B\*b^3\*g^3\*x^3 + 3\*B\*a\*b^2\*g^3\*x^2 + 3\*B\*a^2\*b\*g^3\*x + B\*a^3\*g^3)\*log(e\*((b\*x + a)/(d\*x + c))^n))/(d\*i\*x + c\*i), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*\*3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n))/(d\*i\*x+c\*i),x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^3 \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)}{dix + ci} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i),x, algorithm="giac")

[Out] integrate((b\*g\*x + a\*g)^3\*(B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)/(d\*i\*x + c\*i), x)

$$3.136 \quad \int \frac{(ag+bgx)^2 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{ci+dix} dx$$

**Optimal.** Leaf size=211

$$\frac{Bg^2n(bc-ad)^2 \text{PolyLog} \left( 2, \frac{d(a+bx)}{b(c+dx)} \right)}{d^3i} - \frac{g^2(a+bx)(bc-ad) \left( 2B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + 2A + Bn \right)}{2d^2i} - \frac{g^2(bc-ad)^2 \log \left( \frac{bc-ad}{b(c+dx)} \right)}{2d^2i}$$

[Out]  $(g^2(a+bx)^2(A+B \text{Log}[e((a+bx)/(c+dx))^n]))/(2*d*i) - ((b*c - a*d)*g^2(a+bx)*(2*A + B*n + 2*B*\text{Log}[e((a+bx)/(c+dx))^n]))/(2*d^2*i) - ((b*c - a*d)^2*g^2(2*A + 3*B*n + 2*B*\text{Log}[e((a+bx)/(c+dx))^n])*\text{Log}[(b*c - a*d)/(b*(c+dx))])/(2*d^3*i) - (B*(b*c - a*d)^2*g^2*n*\text{PolyLog}[2, (d*(a+bx))/(b*(c+dx))])/(d^3*i)$

**Rubi [A]** time = 0.487975, antiderivative size = 343, normalized size of antiderivative = 1.63, number of steps used = 18, number of rules used = 13, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.302$ , Rules used = {2528, 2486, 31, 2525, 12, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{Bg^2n(bc-ad)^2 \text{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right)}{d^3i} + \frac{g^2(bc-ad)^2 \log(ci+dix) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{d^3i} + \frac{g^2(a+bx)^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{2di}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[(a*g + b*g*x)^2*(A + B*\text{Log}[e((a+bx)/(c+dx))^n])/(c*i + d*i*x), x]$

[Out]  $-((A*b*(b*c - a*d)*g^2*x)/(d^2*i)) - (b*B*(b*c - a*d)*g^2*n*x)/(2*d^2*i) - (B*(b*c - a*d)*g^2*(a+bx)*\text{Log}[e((a+bx)/(c+dx))^n])/(d^2*i) + (g^2*(a+bx)^2*(A + B*\text{Log}[e((a+bx)/(c+dx))^n]))/(2*d*i) + (3*B*(b*c - a*d)^2*g^2*n*\text{Log}[c+d*x])/(2*d^3*i) + (B*(b*c - a*d)^2*g^2*n*\text{Log}[i*(c+d*x)]^2)/(2*d^3*i) - (B*(b*c - a*d)^2*g^2*n*\text{Log}[-((d*(a+bx))/(b*c - a*d))]*\text{Log}[c*i + d*i*x])/(d^3*i) + ((b*c - a*d)^2*g^2*(A + B*\text{Log}[e((a+bx)/(c+dx))^n])*\text{Log}[c*i + d*i*x])/(d^3*i) - (B*(b*c - a*d)^2*g^2*n*\text{PolyLog}[2, (b*(c+d*x))/(b*c - a*d)])/(d^3*i)$

**Rule 2528**

$\text{Int}[(a_. + \text{Log}[c_.*(\text{RFx}_.)^{(p_.)}]*(b_.))^{(n_.)}*(\text{RGx}_.), x\_Symbol] \text{ :> With} \{[u = \text{ExpandIntegrand}[(a + b*\text{Log}[c*\text{RFx}^p])^n, \text{RGx}, x]\}, \text{Int}[u, x] \text{ /; SumQ}[u$

```
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_.))^(p_.))*((c_.) + (d_.)*(x_.))^(q_.))^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

### Rule 31

```
Int[((a_.) + (b_.)*(x_.))^(n_.), x_Symbol] := Simp[Log[RemoveContent[a + b*x, x]]/b, x] /; FreeQ[{a, b}, x]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_.)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_.)*(v_) /; FreeQ[b, x]]
```

### Rule 43

```
Int[((a_.) + (b_.)*(x_.))^(m_.)*((c_.) + (d_.)*(x_.))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && LeQ[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_.)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol]
:= With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol]
:= Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol]
:= Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_.)*(x_))^(q_.), x_Symbol]
:= Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_))^(n_.)]*(b_.)/(x_), x_Symbol] := Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{(ag + bgx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{136c + 136dx} dx &= \int \left( -\frac{b(bc - ad)g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{136d^2} + \frac{(bc - ad)^2 g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{d^2(136c + 136dx)} \right) dx \\
&= \frac{(bg) \int (ag + bgx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx}{136d} - \frac{(b(bc - ad)g^2) \int \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx}{136d^2} \\
&= -\frac{Ab(bc - ad)g^2 x}{136d^2} + \frac{g^2(a + bx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{272d} + \frac{(bc - ad)^2 g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{136d^2} \\
&= -\frac{Ab(bc - ad)g^2 x}{136d^2} - \frac{B(bc - ad)g^2(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{136d^2} + \frac{g^2(a + bx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{136d^2} \\
&= -\frac{Ab(bc - ad)g^2 x}{136d^2} - \frac{B(bc - ad)g^2(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{136d^2} + \frac{g^2(a + bx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{136d^2} \\
&= -\frac{Ab(bc - ad)g^2 x}{136d^2} - \frac{bB(bc - ad)g^2 nx}{272d^2} - \frac{B(bc - ad)g^2(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{136d^2} \\
&= -\frac{Ab(bc - ad)g^2 x}{136d^2} - \frac{bB(bc - ad)g^2 nx}{272d^2} - \frac{B(bc - ad)g^2(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{136d^2} \\
&= -\frac{Ab(bc - ad)g^2 x}{136d^2} - \frac{bB(bc - ad)g^2 nx}{272d^2} - \frac{B(bc - ad)g^2(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{136d^2}
\end{aligned}$$

**Mathematica [A]** time = 0.175108, size = 266, normalized size = 1.26

$$\frac{g^2 \left( -Bn(bc - ad)^2 \left( 2 \text{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right) + \log(i(c + dx)) \left( 2 \log \left( \frac{d(a+bx)}{ad-bc} \right) - \log(i(c + dx)) \right) \right) + d^2(a + bx)^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) \right)}{136d^2}$$

Antiderivative was successfully verified.

[In] Integrate[((a\*g + b\*g\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(c\*i + d\*i\*x), x]

[Out] (g^2\*(-2\*A\*b\*d\*(b\*c - a\*d)\*x + 2\*B\*d\*(-(b\*c) + a\*d)\*(a + b\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n] + d^2\*(a + b\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 2\*B\*(b\*c - a\*d)^2\*n\*Log[c + d\*x] - B\*(b\*c - a\*d)\*n\*(b\*d\*x + -(b\*c) + a\*d)

) \* Log[c + d\*x]) + 2\*(b\*c - a\*d)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) \* Log[i\*(c + d\*x)] - B\*(b\*c - a\*d)^2\*n\*((2\*Log[(d\*(a + b\*x))/(-b\*c + a\*d)] - Log[i\*(c + d\*x)]) \* Log[i\*(c + d\*x)] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)]) / (2\*d^3\*i)

**Maple [F]** time = 0.695, size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^2}{dix + ci} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i), x)

[Out] int((b\*g\*x+a\*g)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i), x)

**Maxima [B]** time = 2.66897, size = 846, normalized size = 4.01

$$2 Aabg^2 \left( \frac{x}{di} - \frac{c \log(dx + c)}{d^2i} \right) + \frac{1}{2} Ab^2g^2 \left( \frac{2c^2 \log(dx + c)}{d^3i} + \frac{dx^2 - 2cx}{d^2i} \right) + \frac{Aa^2g^2 \log(dix + ci)}{di} + \frac{(b^2c^2g^2n - 2abcdg^2n - \dots)}{\dots}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i), x, alg orithm="maxima")

[Out] 2\*A\*a\*b\*g^2\*(x/(d\*i) - c\*log(d\*x + c)/(d^2\*i)) + 1/2\*A\*b^2\*g^2\*(2\*c^2\*log(d\*x + c)/(d^3\*i) + (d\*x^2 - 2\*c\*x)/(d^2\*i)) + A\*a^2\*g^2\*log(d\*i\*x + c\*i)/(d\*i) + (b^2\*c^2\*g^2\*n - 2\*a\*b\*c\*d\*g^2\*n + a^2\*d^2\*g^2\*n)\*(log(b\*x + a)\*log((b\*d\*x + a\*d)/(b\*c - a\*d) + 1) + dilog(-(b\*d\*x + a\*d)/(b\*c - a\*d)))\*B/(d^3\*i) + 1/2\*(2\*a^2\*d^2\*g^2\*log(e) + (3\*g^2\*n + 2\*g^2\*log(e))\*b^2\*c^2 - 4\*(g^2\*n + g^2\*log(e))\*a\*b\*c\*d)\*B\*log(d\*x + c)/(d^3\*i) + 1/2\*(B\*b^2\*d^2\*g^2\*x^2\*log(e) - 2\*(b^2\*c^2\*g^2\*n - 2\*a\*b\*c\*d\*g^2\*n + a^2\*d^2\*g^2\*n)\*B\*log(b\*x + a)\*log(d\*x + c) + (b^2\*c^2\*g^2\*n - 2\*a\*b\*c\*d\*g^2\*n + a^2\*d^2\*g^2\*n)\*B\*log(d\*x + c)^2 - ((g^2\*n + 2\*g^2\*log(e))\*b^2\*c\*d - (g^2\*n + 4\*g^2\*log(e))\*a\*b\*d^2)\*B\*x - (2\*a\*b\*c\*d\*g^2\*n - 3\*a^2\*d^2\*g^2\*n)\*B\*log(b\*x + a) + (B\*b^2\*d^2\*g^2\*x^2 - 2\*(b^2\*c\*d\*g^2 - 2\*a\*b\*d^2\*g^2)\*B\*x + 2\*(b^2\*c^2\*g^2 - 2\*a\*b\*c\*d\*g^2 + a^2\*d^2\*g^2)\*B\*log(d\*x + c))\*log((b\*x + a)^n) - (B\*b^2\*d^2\*g^2\*x^2 - 2\*(b^2\*c



$*d*g^2 - 2*a*b*d^2*g^2)*B*x + 2*(b^2*c^2*g^2 - 2*a*b*c*d*g^2 + a^2*d^2*g^2)$   
 $*B*log(d*x + c))*log((d*x + c)^n))/(d^3*i)$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{Ab^2g^2x^2 + 2Aabg^2x + Aa^2g^2 + (Bb^2g^2x^2 + 2Babg^2x + Ba^2g^2) \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right)}{dix + ci}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i),x, algorithm="fricas")

[Out] integral((A\*b^2\*g^2\*x^2 + 2\*A\*a\*b\*g^2\*x + A\*a^2\*g^2 + (B\*b^2\*g^2\*x^2 + 2\*B\*a\*b\*g^2\*x + B\*a^2\*g^2)\*log(e\*((b\*x + a)/(d\*x + c))^n))/(d\*i\*x + c\*i), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*\*2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c)\*\*n)))/(d\*i\*x+c\*i),x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^2 \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)}{dix + ci} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i),x, algorithm="giac")

```
[Out] integrate((b*g*x + a*g)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)/(d*i*x + c  
*i), x)
```

$$3.137 \quad \int \frac{(ag+bgx)\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{ci+dix} dx$$

**Optimal.** Leaf size=134

$$\frac{Bgn(bc-ad)\text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)}{d^2i} + \frac{g(bc-ad) \log\left(\frac{bc-ad}{b(c+dx)}\right) \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A + Bn\right)}{d^2i} + \frac{g(a+bx) \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{di}$$

[Out] (g\*(a + b\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(d\*i) + ((b\*c - a\*d)\*g\*(A + B\*n + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[(b\*c - a\*d)/(b\*(c + d\*x))])/(d^2\*i) + (B\*(b\*c - a\*d)\*g\*n\*PolyLog[2, (d\*(a + b\*x))/(b\*(c + d\*x))])/(d^2\*i)

**Rubi [A]** time = 0.388567, antiderivative size = 223, normalized size of antiderivative = 1.66, number of steps used = 13, number of rules used = 10, integrand size = 41,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.244$ , Rules used = {2528, 2486, 31, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{Bgn(bc-ad)\text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{d^2i} - \frac{g(bc-ad) \log(c+dx) \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{d^2i} - \frac{Bgn(bc-ad) \log^2(c+dx)}{2d^2i} - \frac{Bgn}{d^2i}$$

Antiderivative was successfully verified.

[In] Int[((a\*g + b\*g\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(c\*i + d\*i\*x),x]

[Out] (A\*b\*g\*x)/(d\*i) + (B\*g\*(a + b\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n])/(d\*i) - (B\*(b\*c - a\*d)\*g\*n\*Log[c + d\*x])/(d^2\*i) + (B\*(b\*c - a\*d)\*g\*n\*Log[-((d\*(a + b\*x))/(b\*c - a\*d))]\*Log[c + d\*x])/(d^2\*i) - ((b\*c - a\*d)\*g\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[c + d\*x])/(d^2\*i) - (B\*(b\*c - a\*d)\*g\*n\*Log[c + d\*x]^2)/(2\*d^2\*i) + (B\*(b\*c - a\*d)\*g\*n\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])/(d^2\*i)

### Rule 2528

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*(RGx\_), x\_Symbol] :> With[{u = ExpandIntegrand[(a + b\*Log[c\*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

### Rule 2486

```
Int[Log[(e_.)*((f_.)*(a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q]^r]^s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

### Rule 31

```
Int[((a_) + (b_.)*(x_))^(n_), x_Symbol] := Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFX^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFX_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFX, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFX, x] && IntegerQ[p]
```

### Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)
]^n))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.)\*(x\_))^(q\_.), x\_Symbol] := Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] := Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

Rubi steps

$$\begin{aligned}
 \int \frac{(ag + bgx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{137c + 137dx} dx &= \int \left( \frac{bg \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{137d} + \frac{(-bc + ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{137d(c + dx)} \right) dx \\
 &= \frac{(bg) \int \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx}{137d} - \frac{((bc - ad)g) \int \frac{A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{c+dx} dx}{137d} \\
 &= \frac{Abgx}{137d} - \frac{(bc - ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) \log(c + dx)}{137d^2} + \frac{(bBg) \int \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) dx}{137d} \\
 &= \frac{Abgx}{137d} + \frac{Bg(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{137d} - \frac{(bc - ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) \log(c + dx)}{137d^2} \\
 &= \frac{Abgx}{137d} + \frac{Bg(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{137d} - \frac{B(bc - ad)gn \log(c + dx)}{137d^2} - \frac{(bc - ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) \log(c + dx)}{137d^2} \\
 &= \frac{Abgx}{137d} + \frac{Bg(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{137d} - \frac{B(bc - ad)gn \log(c + dx)}{137d^2} + \frac{B(bc - ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) \log(c + dx)}{137d^2} \\
 &= \frac{Abgx}{137d} + \frac{Bg(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{137d} - \frac{B(bc - ad)gn \log(c + dx)}{137d^2} + \frac{B(bc - ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) \log(c + dx)}{137d^2} \\
 &= \frac{Abgx}{137d} + \frac{Bg(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{137d} - \frac{B(bc - ad)gn \log(c + dx)}{137d^2} + \frac{B(bc - ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) \log(c + dx)}{137d^2}
 \end{aligned}$$

**Mathematica [A]** time = 0.118595, size = 170, normalized size = 1.27

$$\frac{g \left( Bn(bc - ad) \left( 2 \operatorname{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right) + \log(c + dx) \left( 2 \log \left( \frac{d(a+bx)}{ad-bc} \right) - \log(c + dx) \right) \right) - 2(bc - ad) \log(c + dx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{2d^2i}$$

Antiderivative was successfully verified.

[In] Integrate[((a\*g + b\*g\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(c\*i + d\*i\*x), x]

[Out] (g\*(2\*A\*b\*d\*x + 2\*B\*d\*(a + b\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n] - 2\*B\*(b\*c - a\*d)\*n\*Log[c + d\*x] - 2\*(b\*c - a\*d)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) \*Log[c + d\*x] + B\*(b\*c - a\*d)\*n\*((2\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)] - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])))/(2\*d^2\*i)

**Maple [F]** time = 0.645, size = 0, normalized size = 0.

$$\int \frac{bgx + ag}{dix + ci} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i), x)

[Out] int((b\*g\*x+a\*g)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i), x)

**Maxima [B]** time = 2.68274, size = 413, normalized size = 3.08

$$A \frac{g}{d^2i} \left( \frac{x}{d} - \frac{c \log(dx + c)}{d^2i} \right) + \frac{Aag \log(dix + ci)}{di} - \frac{(bcgn - adgn) \left( \log(bx + a) \log \left( \frac{bdx+ad}{bc-ad} + 1 \right) + \operatorname{Li}_2 \left( -\frac{bdx+ad}{bc-ad} \right) \right) B}{d^2i} + \frac{(adg)}{d^2i}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i), x, algorithm="maxima")

```
[Out] A*b*g*(x/(d*i) - c*log(d*x + c)/(d^2*i)) + A*a*g*log(d*i*x + c*i)/(d*i) - (
b*c*g*n - a*d*g*n)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog
(-(b*d*x + a*d)/(b*c - a*d)))*B/(d^2*i) + (a*d*g*log(e) - (g*n + g*log(e))*
b*c)*B*log(d*x + c)/(d^2*i) + 1/2*(2*B*a*d*g*n*log(b*x + a) + 2*B*b*d*g*x*log
(e) + 2*(b*c*g*n - a*d*g*n)*B*log(b*x + a)*log(d*x + c) - (b*c*g*n - a*d*
g*n)*B*log(d*x + c)^2 + 2*(B*b*d*g*x - (b*c*g - a*d*g)*B*log(d*x + c))*log(
(b*x + a)^n) - 2*(B*b*d*g*x - (b*c*g - a*d*g)*B*log(d*x + c))*log((d*x + c
^n))/(d^2*i)
```

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{A b g x + A a g + (B b g x + B a g) \log \left( e^{\left( \frac{b x + a}{d x + c} \right)^n} \right)}{d i x + c i}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x, algo
rithm="fricas")
```

```
[Out] integral((A*b*g*x + A*a*g + (B*b*g*x + B*a*g)*log(e*((b*x + a)/(d*x + c))^n
))/(d*i*x + c*i), x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(b g x + a g) \left( B \log \left( e^{\left( \frac{b x + a}{d x + c} \right)^n} \right) + A \right)}{d i x + c i} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)/(d*i*x + c*i), x)
```



$$3.138 \quad \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{ci+dx} dx$$

**Optimal.** Leaf size=80

$$\frac{Bn \text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)}{di} - \frac{\log\left(\frac{bc-ad}{b(c+dx)}\right) \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{di}$$

[Out] -(((A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[(b\*c - a\*d)/(b\*(c + d\*x))])/(d\*i)) - (B\*n\*PolyLog[2, (d\*(a + b\*x))/(b\*(c + d\*x))])/(d\*i)

**Rubi [A]** time = 0.20157, antiderivative size = 128, normalized size of antiderivative = 1.6, number of steps used = 9, number of rules used = 8, integrand size = 33,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.242$ , Rules used = {2524, 2418, 2394, 2393, 2391, 2390, 12, 2301}

$$-\frac{Bn \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{di} + \frac{\log(ci + dix) \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{di} - \frac{Bn \log(ci + dix) \log\left(-\frac{d(a+bx)}{bc-ad}\right)}{di} + \frac{Bn \log^2(i(c + dx))}{2di}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])/(c\*i + d\*i\*x), x]

[Out] (B\*n\*Log[i\*(c + d\*x)]^2)/(2\*d\*i) - (B\*n\*Log[-((d\*(a + b\*x))/(b\*c - a\*d))]\*Log[c\*i + d\*i\*x])/(d\*i) + ((A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[c\*i + d\*i\*x])/(d\*i) - (B\*n\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])/(d\*i)

### Rule 2524

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] :> Simp[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^n)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

### Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_.) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*(RFx\_), x\_Symbol] :> With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_.)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_))^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{138c + 138dx} dx &= \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) \log(138c + 138dx)}{138d} - \frac{(Bn) \int \frac{(c+dx)\left(-\frac{d(a+bx)}{(c+dx)^2} + \frac{b}{c+dx}\right) \log(138c+138dx)}{a+bx} dx}{138d} \\
&= \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) \log(138c + 138dx)}{138d} - \frac{(Bn) \int \left(\frac{b \log(138c+138dx)}{a+bx} - \frac{d \log(138c+138dx)}{c+dx}\right)}{138d} \\
&= \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) \log(138c + 138dx)}{138d} + \frac{1}{138} (Bn) \int \frac{\log(138c + 138dx)}{c + dx} dx - \frac{(bBn)}{138d} \\
&= -\frac{Bn \log\left(-\frac{d(a+bx)}{bc-ad}\right) \log(138c + 138dx)}{138d} + \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) \log(138c + 138dx)}{138d} + (Bn) \int \frac{\log(138c + 138dx)}{c + dx} dx \\
&= -\frac{Bn \log\left(-\frac{d(a+bx)}{bc-ad}\right) \log(138c + 138dx)}{138d} + \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) \log(138c + 138dx)}{138d} + (Bn) \int \frac{\log(138c + 138dx)}{c + dx} dx \\
&= \frac{Bn \log^2(138(c + dx))}{276d} - \frac{Bn \log\left(-\frac{d(a+bx)}{bc-ad}\right) \log(138c + 138dx)}{138d} + \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) \log(138c + 138dx)}{138d} + (Bn) \int \frac{\log(138c + 138dx)}{c + dx} dx
\end{aligned}$$

**Mathematica [A]** time = 0.0322407, size = 101, normalized size = 1.26

$$\frac{\log(i(c + dx)) \left( 2B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) - 2Bn \log\left(\frac{d(a+bx)}{ad-bc}\right) + 2A + Bn \log(i(c + dx)) \right) - 2Bn \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{2di}$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])/(c\*i + d\*i\*x), x]

[Out] (Log[i\*(c + d\*x)]\*(2\*A - 2\*B\*n\*Log[(d\*(a + b\*x))/(-b\*c) + a\*d]) + 2\*B\*Log[e\*((a + b\*x)/(c + d\*x))^n] + B\*n\*Log[i\*(c + d\*x)]) - 2\*B\*n\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)]/(2\*d\*i)

**Maple [F]** time = 0.611, size = 0, normalized size = 0.

$$\int \frac{1}{dix + ci} \left( A + B \ln\left(e\left(\frac{bx + a}{dx + c}\right)^n\right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x)`

[Out] `int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x)`

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2}B \left( \frac{2n \log(bx+a) \log(dx+c) - n \log(dx+c)^2 - 2 \log(dx+c) \log((bx+a)^n) + 2 \log(dx+c) \log((dx+c)^n)}{di} - 2 \int \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x, algorithm="maxima")`

[Out] `-1/2*B*((2*n*log(b*x + a)*log(d*x + c) - n*log(d*x + c)^2 - 2*log(d*x + c)*log((b*x + a)^n) + 2*log(d*x + c)*log((d*x + c)^n))/(d*i) - 2*integrate((n*log(b*x + a) + log(e))/(d*i*x + c*i), x) + A*log(d*i*x + c*i)/(d*i)`

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A}{dix + ci}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x, algorithm="fricas")`

[Out] `integral((B*log(e*((b*x + a)/(d*x + c))^n) + A)/(d*i*x + c*i), x)`

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A}{dix + ci} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i),x, algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)/(d*i*x + c*i), x)
```

$$3.139 \quad \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)(ci+dix)} dx$$

**Optimal.** Leaf size=50

$$\frac{\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)^2}{2Bgin(bc - ad)}$$

[Out] (A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2/(2\*B\*(b\*c - a\*d)\*g\*i\*n)

**Rubi [C]** time = 0.556831, antiderivative size = 316, normalized size of antiderivative = 6.32, number of steps used = 18, number of rules used = 8, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.186$ , Rules used = {2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{Bn \text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{gi(bc - ad)} + \frac{Bn \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{gi(bc - ad)} + \frac{\log(a + bx) \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{gi(bc - ad)} - \frac{\log(c + dx) \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{gi(bc - ad)}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])/((a\*g + b\*g\*x)\*(c\*i + d\*i\*x)),x]

[Out] -(B\*n\*Log[a + b\*x]^2)/(2\*(b\*c - a\*d)\*g\*i) + (Log[a + b\*x]\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/((b\*c - a\*d)\*g\*i) + (B\*n\*Log[-((d\*(a + b\*x))/(b\*c - a\*d))]\*Log[c + d\*x])/((b\*c - a\*d)\*g\*i) - ((A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[c + d\*x])/((b\*c - a\*d)\*g\*i) - (B\*n\*Log[c + d\*x]^2)/(2\*(b\*c - a\*d)\*g\*i) + (B\*n\*Log[a + b\*x]\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]/((b\*c - a\*d)\*g\*i) + (B\*n\*PolyLog[2, -((d\*(a + b\*x))/(b\*c - a\*d))])/((b\*c - a\*d)\*g\*i) + (B\*n\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)]/((b\*c - a\*d)\*g\*i)

### Rule 2528

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*(RGx\_), x\_Symbol] :> With[{u = ExpandIntegrand[(a + b\*Log[c\*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol]
:> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e,
Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol]
:> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)
*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x],
x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Log[
c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)),
x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])/g, x] -
Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol]
:> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2,
-(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rubi steps

$$\begin{aligned}
\int \frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(139c + 139dx)(ag + bgx)} dx &= \int \left( \frac{b\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{139(bc - ad)g(a + bx)} - \frac{d\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{139(bc - ad)g(c + dx)} \right) dx \\
&= \frac{b \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx} dx}{139(bc - ad)g} - \frac{d \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx} dx}{139(bc - ad)g} \\
&= \frac{\log(a + bx)\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{139(bc - ad)g} - \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c + dx)}{139(bc - ad)g} - \frac{(Bn) \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx} dx}{139(bc - ad)g} \\
&= \frac{\log(a + bx)\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{139(bc - ad)g} - \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c + dx)}{139(bc - ad)g} - \frac{(Bn) \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx} dx}{139(bc - ad)g} \\
&= \frac{\log(a + bx)\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{139(bc - ad)g} - \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c + dx)}{139(bc - ad)g} - \frac{(bBn) \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx} dx}{139(bc - ad)g} \\
&= \frac{\log(a + bx)\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{139(bc - ad)g} + \frac{Bn \log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(c + dx)}{139(bc - ad)g} - \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c + dx)}{139(bc - ad)g} \\
&= -\frac{Bn \log^2(a + bx)}{278(bc - ad)g} + \frac{\log(a + bx)\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{139(bc - ad)g} + \frac{Bn \log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(c + dx)}{139(bc - ad)g} \\
&= -\frac{Bn \log^2(a + bx)}{278(bc - ad)g} + \frac{\log(a + bx)\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{139(bc - ad)g} + \frac{Bn \log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(c + dx)}{139(bc - ad)g}
\end{aligned}$$

**Mathematica [C]** time = 0.103702, size = 219, normalized size = 4.38

$$2Bn \text{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) + 2Bn \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right) + 2A \log(a + bx) + 2B \log(a + bx) \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) - 2B \log(c + dx) \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])/((a\*g + b\*g\*x)\*(c\*i + d\*i\*x)), x]

[Out] (2\*A\*Log[a + b\*x] - B\*n\*Log[a + b\*x]^2 + 2\*B\*Log[a + b\*x]\*Log[e\*((a + b\*x)/(c + d\*x))^n] - 2\*A\*Log[c + d\*x] + 2\*B\*n\*Log[(d\*(a + b\*x))/(-b\*c) + a\*d])\*



$\text{Log}[c + d*x] - 2*B*\text{Log}[e*((a + b*x)/(c + d*x))^n]*\text{Log}[c + d*x] - B*n*\text{Log}[c + d*x]^2 + 2*B*n*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)] + 2*B*n*\text{PolyLog}[2, (d*(a + b*x))/(-b*c + a*d)] + 2*B*n*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]/(2*(b*c - a*d)*g*i)$

**Maple [F]** time = 0.758, size = 0, normalized size = 0.

$$\int \frac{1}{(bgx + ag)(dix + ci)} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)/(d\*i\*x+c\*i),x)

[Out] int((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)/(d\*i\*x+c\*i),x)

**Maxima [B]** time = 1.16397, size = 236, normalized size = 4.72

$$B \left( \frac{\log(bx + a)}{(bc - ad)gi} - \frac{\log(dx + c)}{(bc - ad)gi} \right) \log \left( e \left( \frac{bx}{dx + c} + \frac{a}{dx + c} \right)^n \right) - \frac{(\log(bx + a))^2 - 2 \log(bx + a) \log(dx + c) + \log(dx + c)^2}{2(bcgi - adgi)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)/(d\*i\*x+c\*i),x, algorithm="maxima")

[Out]  $B*(\log(b*x + a)/((b*c - a*d)*g*i) - \log(d*x + c)/((b*c - a*d)*g*i))*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) - 1/2*(\log(b*x + a)^2 - 2*\log(b*x + a)*\log(d*x + c) + \log(d*x + c)^2)*B*n/(b*c*g*i - a*d*g*i) + A*(\log(b*x + a)/((b*c - a*d)*g*i) - \log(d*x + c)/((b*c - a*d)*g*i))$

**Fricas [A]** time = 0.513175, size = 169, normalized size = 3.38

$$\frac{Bn \log \left( \frac{bx+a}{dx+c} \right)^2 + 2B \log(e) \log \left( \frac{bx+a}{dx+c} \right) + 2A \log \left( \frac{bx+a}{dx+c} \right)}{2(bc - ad)gi}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)/(d*i*x+c*i),x, algorithm="fricas")
```

```
[Out] 1/2*(B*n*log((b*x + a)/(d*x + c))^2 + 2*B*log(e)*log((b*x + a)/(d*x + c)) + 2*A*log((b*x + a)/(d*x + c)))/((b*c - a*d)*g*i)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

**Giac [B]** time = 1.30973, size = 143, normalized size = 2.86

$$-\frac{Bin \log\left(\frac{bx+a}{dx+c}\right)^2}{2(bcg - adg)} - \frac{(Ai + Bi) \log\left(\left|\frac{2bdx+bc+ad-|bc+ad|}{2bdx+bc+ad+|bc+ad|}\right|\right)}{g|-bc + ad|}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)/(d*i*x+c*i),x, algorithm="giac")
```

```
[Out] -1/2*B*i*n*log((b*x + a)/(d*x + c))^2/(b*c*g - a*d*g) - (A*i + B*i)*log(abs((2*b*d*x + b*c + a*d - abs(-b*c + a*d))/(2*b*d*x + b*c + a*d + abs(-b*c + a*d))))/(g*abs(-b*c + a*d))
```

$$3.140 \quad \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^2(ci+dx)} dx$$

**Optimal.** Leaf size=181

$$\frac{d \log\left(\frac{a+bx}{c+dx}\right) \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{g^2 i(bc-ad)^2} - \frac{b(c+dx) \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{g^2 i(a+bx)(bc-ad)^2} - \frac{bBn(c+dx)}{g^2 i(a+bx)(bc-ad)^2} + \frac{Bdn \log^2\left(\frac{a+bx}{c+dx}\right)}{2g^2 i(bc-ad)^2}$$

[Out]  $-\left(\frac{bBn(c+dx)}{(b^2c-ad)^2 g^{2i}(a+bx)}\right) - \frac{b(c+dx)(A+B \log[e*((a+bx)/(c+dx))^n])}{(b^2c-ad)^2 g^{2i}(a+bx)} - \frac{d(A+B \log[e*((a+bx)/(c+dx))^n]) \log[(a+bx)/(c+dx)]}{(b^2c-ad)^2 g^{2i}} + \frac{Bdn \log^2[(a+bx)/(c+dx)]}{2(b^2c-ad)^2 g^{2i}}$

**Rubi [C]** time = 0.688696, antiderivative size = 455, normalized size of antiderivative = 2.51, number of steps used = 22, number of rules used = 11, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.256$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{Bdn \text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{g^2 i(bc-ad)^2} - \frac{Bdn \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{g^2 i(bc-ad)^2} - \frac{d \log(a+bx) \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{g^2 i(bc-ad)^2} - \frac{B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A}{g^2 i(a+bx)(bc-ad)^2}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])/((a\*g + b\*g\*x)^2\*(c\*i + d\*i\*x)), x]

[Out]  $-\left(\frac{Bdn}{(b^2c-ad)^2 g^{2i}(a+bx)}\right) - \frac{Bdn \log[a+bx]}{(b^2c-ad)^2 g^{2i}} - \frac{d(A+B \log[e*((a+bx)/(c+dx))^n])}{(b^2c-ad)^2 g^{2i}} - \frac{d \log[a+bx] (A+B \log[e*((a+bx)/(c+dx))^n])}{(b^2c-ad)^2 g^{2i}} + \frac{d(A+B \log[e*((a+bx)/(c+dx))^n]) \log[c+dx]}{(b^2c-ad)^2 g^{2i}} - \frac{d(A+B \log[e*((a+bx)/(c+dx))^n]) \log[c+dx]}{(b^2c-ad)^2 g^{2i}} + \frac{Bdn \log[c+dx]^2}{2(b^2c-ad)^2 g^{2i}} - \frac{Bdn \log[a+bx] \log[(b(c+dx))/(b^2c-ad)]}{(b^2c-ad)^2 g^{2i}} - \frac{Bdn \log[a+bx] \log[(b(c+dx))/(b^2c-ad)]}{(b^2c-ad)^2 g^{2i}} - \frac{Bdn \text{PolyLog}[2, -((d(a+bx))/(b^2c-ad))]}{(b^2c-ad)^2 g^{2i}} - \frac{Bdn \text{PolyLog}[2, (b(c+dx))/(b^2c-ad)]}{(b^2c-ad)^2 g^{2i}}$

**Rule 2528**

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]
] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[
((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[
((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
```

qQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] :> Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :> Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n]))/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :> Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] :> -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rubi steps

$$\begin{aligned}
\int \frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(140c + 140dx)(ag + bgx)^2} dx &= \int \left( \frac{b\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{140(bc - ad)g^2(a + bx)^2} - \frac{bd\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{140(bc - ad)^2g^2(a + bx)} + \frac{d^2\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{140(bc - ad)^2g^2(c + dx)} \right) dx \\
&= -\frac{(bd) \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx} dx}{140(bc - ad)^2g^2} + \frac{d^2 \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx} dx}{140(bc - ad)^2g^2} + \frac{b \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^2} dx}{140(bc - ad)g^2} \\
&= -\frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{140(bc - ad)g^2(a + bx)} - \frac{d \log(a + bx)\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{140(bc - ad)^2g^2} + \frac{d\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{140(bc - ad)g^2} \\
&= -\frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{140(bc - ad)g^2(a + bx)} - \frac{d \log(a + bx)\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{140(bc - ad)^2g^2} + \frac{d\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{140(bc - ad)g^2} \\
&= -\frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{140(bc - ad)g^2(a + bx)} - \frac{d \log(a + bx)\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{140(bc - ad)^2g^2} + \frac{d\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{140(bc - ad)g^2} \\
&= -\frac{Bn}{140(bc - ad)g^2(a + bx)} - \frac{Bdn \log(a + bx)}{140(bc - ad)^2g^2} - \frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{140(bc - ad)g^2(a + bx)} - \frac{d \log(a + bx)}{140(bc - ad)g^2} \\
&= -\frac{Bn}{140(bc - ad)g^2(a + bx)} - \frac{Bdn \log(a + bx)}{140(bc - ad)^2g^2} + \frac{Bdn \log^2(a + bx)}{280(bc - ad)^2g^2} - \frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{140(bc - ad)g^2(a + bx)} \\
&= -\frac{Bn}{140(bc - ad)g^2(a + bx)} - \frac{Bdn \log(a + bx)}{140(bc - ad)^2g^2} + \frac{Bdn \log^2(a + bx)}{280(bc - ad)^2g^2} - \frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{140(bc - ad)g^2(a + bx)}
\end{aligned}$$

**Mathematica [C]** time = 0.283996, size = 304, normalized size = 1.68

$$-Bdn(a + bx) \left( \log(a + bx) \left( \log(a + bx) - 2 \log\left(\frac{b(c+dx)}{bc-ad}\right) \right) - 2 \text{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) \right) + Bdn(a + bx) \left( 2 \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right) \right)$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])/((a\*g + b\*g\*x)^2\*(c\*i + d\*i\*x)), x]

[Out] -(2\*(b\*c - a\*d)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 2\*d\*(a + b\*x)\*Log[a + b\*x]\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 2\*d\*(a + b\*x)\*(A + B\*Log[

$e*((a + b*x)/(c + d*x))^n) * \text{Log}[c + d*x] + 2*B*n*(b*c - a*d + d*(a + b*x)*\text{Log}[a + b*x] - d*(a + b*x)*\text{Log}[c + d*x]) - B*d*n*(a + b*x)*(\text{Log}[a + b*x]*(\text{Log}[a + b*x] - 2*\text{Log}[(b*(c + d*x))/(b*c - a*d)]) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-b*c + a*d)]) + B*d*n*(a + b*x)*((2*\text{Log}[(d*(a + b*x))/(-b*c + a*d)] - \text{Log}[c + d*x]) * \text{Log}[c + d*x] + 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])/(2*(b*c - a*d)^2*g^2*i*(a + b*x))$

**Maple [F]** time = 0.75, size = 0, normalized size = 0.

$$\int \frac{1}{(bgx + ag)^2 (dix + ci)} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^2/(d\*i\*x+c\*i),x)

[Out] int((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^2/(d\*i\*x+c\*i),x)

**Maxima [B]** time = 1.32297, size = 576, normalized size = 3.18

$$-B \left( \frac{1}{(b^2c - abd)g^2ix + (abc - a^2d)g^2i} + \frac{d \log(bx + a)}{(b^2c^2 - 2abcd + a^2d^2)g^2i} - \frac{d \log(dx + c)}{(b^2c^2 - 2abcd + a^2d^2)g^2i} \right) \log \left( e \left( \frac{bx}{dx + c} + \frac{a}{dx + c} \right)^n \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^2/(d\*i\*x+c\*i),x, algorithm="maxima")

[Out] -B\*(1/((b^2\*c - a\*b\*d)\*g^2\*i\*x + (a\*b\*c - a^2\*d)\*g^2\*i) + d\*log(b\*x + a)/((b^2\*c^2 - 2\*a\*b\*c\*d + a^2\*d^2)\*g^2\*i) - d\*log(d\*x + c)/((b^2\*c^2 - 2\*a\*b\*c\*d + a^2\*d^2)\*g^2\*i))\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n) + 1/2\*((b\*d\*x + a\*d)\*log(b\*x + a)^2 + (b\*d\*x + a\*d)\*log(d\*x + c)^2 - 2\*b\*c + 2\*a\*d - 2\*(b\*d\*x + a\*d)\*log(b\*x + a) + 2\*(b\*d\*x + a\*d - (b\*d\*x + a\*d)\*log(b\*x + a))\*log(d\*x + c))\*B\*n/(a\*b^2\*c^2\*g^2\*i - 2\*a^2\*b\*c\*d\*g^2\*i + a^3\*d^2\*g^2\*i + (b^3\*c^2\*g^2\*i - 2\*a\*b^2\*c\*d\*g^2\*i + a^2\*b\*d^2\*g^2\*i)\*x) - A\*(1/((b^2\*c - a\*b\*d)\*g^2\*i\*x + (a\*b\*c - a^2\*d)\*g^2\*i) + d\*log(b\*x + a)/((b^2\*c^2 - 2\*a\*b\*c\*d + a^2\*d^2)\*g^2\*i) - d\*log(d\*x + c)/((b^2\*c^2 - 2\*a\*b\*c\*d + a^2\*d^2)\*g^2\*i))

---

**Fricas [A]** time = 0.504065, size = 446, normalized size = 2.46

$$\frac{2Abc - 2Aad + (Bbdnx + Badn) \log\left(\frac{bx+a}{dx+c}\right)^2 + 2(Bbc - Bad)n + 2\left(Bbc - Bad + (Bbdx + Bad) \log\left(\frac{bx+a}{dx+c}\right)\right) \log(e) + 2\left(\frac{bx+a}{dx+c}\right) \log(e)}{2\left(\left(b^3c^2 - 2ab^2cd + a^2bd^2\right)g^2ix + \left(ab^2c^2 - 2a^2bcd + a^3d^2\right)g^2i\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^2/(d\*i\*x+c\*i), x, algorithm="fricas")

[Out] -1/2\*(2\*A\*b\*c - 2\*A\*a\*d + (B\*b\*d\*n\*x + B\*a\*d\*n)\*log((b\*x + a)/(d\*x + c))^2 + 2\*(B\*b\*c - B\*a\*d)\*n + 2\*(B\*b\*c - B\*a\*d + (B\*b\*d\*x + B\*a\*d)\*log((b\*x + a)/(d\*x + c)))\*log(e) + 2\*(B\*b\*c\*n + A\*a\*d + (B\*b\*d\*n + A\*b\*d)\*x)\*log((b\*x + a)/(d\*x + c)))/((b^3\*c^2 - 2\*a\*b^2\*c\*d + a^2\*b\*d^2)\*g^2\*i\*x + (a\*b^2\*c^2 - 2\*a^2\*b\*c\*d + a^3\*d^2)\*g^2\*i)

---

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)\*\*2/(d\*i\*x+c\*i), x)

[Out] Timed out

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{B \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A}{(bgx + ag)^2(dx + ci)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^2/(d\*i\*x+c\*i), x, algorithm="giac")



```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)/((b*g*x + a*g)^2*(d*i*x + c*i)), x)
```

$$3.141 \quad \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^3(ci+dix)} dx$$

**Optimal.** Leaf size=266

$$-\frac{b^2(c+dx)^2\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^3i(a+bx)^2(bc-ad)^3} + \frac{d^2 \log\left(\frac{a+bx}{c+dx}\right)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^3i(bc-ad)^3} + \frac{2bd(c+dx)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^3i(a+bx)(bc-ad)^3} - \frac{B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{g^3i(bc-ad)^3}$$

[Out]  $-(B*n*(c+d*x)^2*(b-(4*d*(a+b*x))/(c+d*x))^2/(4*(b*c-a*d)^3*g^3*i*(a+b*x)^2) + (2*b*d*(c+d*x)*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/((b*c-a*d)^3*g^3*i*(a+b*x)) - (b^2*(c+d*x)^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(2*(b*c-a*d)^3*g^3*i*(a+b*x)^2) + (d^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n])*Log[(a+b*x)/(c+d*x)])/((b*c-a*d)^3*g^3*i) - (B*d^2*n*Log[(a+b*x)/(c+d*x)]^2)/(2*(b*c-a*d)^3*g^3*i)$

**Rubi [C]** time = 0.834219, antiderivative size = 557, normalized size of antiderivative = 2.09, number of steps used = 26, number of rules used = 11, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.256$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{Bd^2n \text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{g^3i(bc-ad)^3} + \frac{Bd^2n \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{g^3i(bc-ad)^3} + \frac{d^2 \log(a+bx)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^3i(bc-ad)^3} - \frac{d^2 \log(c+dx)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^3i(bc-ad)^3}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[(A+B*Log[e*((a+b*x)/(c+d*x))^n])/((a*g+b*g*x)^3*(c*i+d*i*x)), x]$

[Out]  $-(B*n)/(4*(b*c-a*d)*g^3*i*(a+b*x)^2) + (3*B*d*n)/(2*(b*c-a*d)^2*g^3*i*(a+b*x)) + (3*B*d^2*n*Log[a+b*x])/(2*(b*c-a*d)^3*g^3*i) - (B*d^2*n*Log[a+b*x]^2)/(2*(b*c-a*d)^3*g^3*i) - (A+B*Log[e*((a+b*x)/(c+d*x))^n])/(2*(b*c-a*d)*g^3*i*(a+b*x)^2) + (d*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/((b*c-a*d)^2*g^3*i*(a+b*x)) + (d^2*Log[a+b*x]*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/((b*c-a*d)^3*g^3*i) - (3*B*d^2*n*Log[c+d*x])/(2*(b*c-a*d)^3*g^3*i) + (B*d^2*n*Log[-((d*(a+b*x))/(b*c-a*d))]*Log[c+d*x])/((b*c-a*d)^3*g^3*i) - (d^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n])*Log[c+d*x])/((b*c-a*d)^3*g^3*i) - (B*d^2*n*Log[c+d*x]^2)/(2*(b*c-a*d)^3*g^3*i) + (B*d^2*n*Log[a+b*x]*Log[(b*(c+d*x))/(b*c-a*d)])/((b*c-a*d)^3*g^3*i) + (B*d^2*n*PolyLog[2, -((d*(a+b*x))/(b*c-a*d))])/((b*c-a*d)^3*g^3*i) + (B*d^2*n*PolyLog[2, (b*(c+d*x))/(b*c-a*d)])/((b*c-a$

\*d)^3\*g^3\*i)

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(Rfx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, Rfx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
Rfx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)
)*(x_)^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}
\int \frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(141c + 141dx)(ag + bgx)^3} dx &= \int \left( \frac{b\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{141(bc - ad)g^3(a + bx)^3} - \frac{bd\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{141(bc - ad)^2g^3(a + bx)^2} + \frac{bd^2\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{141(bc - ad)^3g^3(a + bx)} \right) dx \\
&= \frac{(bd^2) \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx} dx}{141(bc - ad)^3g^3} - \frac{d^3 \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx} dx}{141(bc - ad)^3g^3} - \frac{(bd) \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^2} dx}{141(bc - ad)^2g^3} + \dots \\
&= -\frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{282(bc - ad)g^3(a + bx)^2} + \frac{d\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{141(bc - ad)^2g^3(a + bx)} + \frac{d^2 \log(a + bx)\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{141(bc - ad)^3g^3} + \dots \\
&= -\frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{282(bc - ad)g^3(a + bx)^2} + \frac{d\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{141(bc - ad)^2g^3(a + bx)} + \frac{d^2 \log(a + bx)\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{141(bc - ad)^3g^3} + \dots \\
&= -\frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{282(bc - ad)g^3(a + bx)^2} + \frac{d\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{141(bc - ad)^2g^3(a + bx)} + \frac{d^2 \log(a + bx)\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{141(bc - ad)^3g^3} + \dots \\
&= -\frac{Bn}{564(bc - ad)g^3(a + bx)^2} + \frac{Bdn}{94(bc - ad)^2g^3(a + bx)} + \frac{Bd^2n \log(a + bx)}{94(bc - ad)^3g^3} - \frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{282(bc - ad)g^3(a + bx)} + \dots \\
&= -\frac{Bn}{564(bc - ad)g^3(a + bx)^2} + \frac{Bdn}{94(bc - ad)^2g^3(a + bx)} + \frac{Bd^2n \log(a + bx)}{94(bc - ad)^3g^3} - \frac{Bd^2n \log(a + bx)}{282(bc - ad)g^3(a + bx)} + \dots \\
&= -\frac{Bn}{564(bc - ad)g^3(a + bx)^2} + \frac{Bdn}{94(bc - ad)^2g^3(a + bx)} + \frac{Bd^2n \log(a + bx)}{94(bc - ad)^3g^3} - \frac{Bd^2n \log(a + bx)}{282(bc - ad)g^3(a + bx)} + \dots
\end{aligned}$$

**Mathematica [C]** time = 0.380885, size = 434, normalized size = 1.63

$$-2Bd^2n(a + bx)^2 \left( \log(a + bx) \left( \log(a + bx) - 2 \log\left(\frac{b(c+dx)}{bc-ad}\right) \right) - 2\text{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) \right) + 2Bd^2n(a + bx)^2 \left( 2\text{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) \right)$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])/((a\*g + b\*g\*x)^3\*(c\*i + d\*i\*x)), x]

[Out] (-2\*(b\*c - a\*d)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 4\*d\*(b\*c - a\*d)\*(a + b\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 4\*d^2\*(a + b\*x)^2\*Log[a

$$+ b*x] * (A + B * \text{Log}[e*((a + b*x)/(c + d*x))^n]) - 4*d^2*(a + b*x)^2*(A + B * \text{Log}[e*((a + b*x)/(c + d*x))^n]) * \text{Log}[c + d*x] + 4*B*d*n*(a + b*x)*(b*c - a*d + d*(a + b*x)*\text{Log}[a + b*x] - d*(a + b*x)*\text{Log}[c + d*x]) - B*n*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*\text{Log}[a + b*x] + 2*d^2*(a + b*x)^2*\text{Log}[c + d*x]) - 2*B*d^2*n*(a + b*x)^2*(\text{Log}[a + b*x]*(\text{Log}[a + b*x] - 2*\text{Log}[(b*(c + d*x))/(b*c - a*d)]) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*B*d^2*n*(a + b*x)^2*((2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] - \text{Log}[c + d*x]) * \text{Log}[c + d*x] + 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]) / (4*(b*c - a*d)^3*g^3*i*(a + b*x)^2)$$

**Maple [F]** time = 0.764, size = 0, normalized size = 0.

$$\int \frac{1}{(bgx + ag)^3 (dix + ci)} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i),x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i),x)
```

**Maxima [B]** time = 1.42947, size = 1199, normalized size = 4.51

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i),x, alg
orithm="maxima")
```

```
[Out] 1/2*B*((2*b*d*x - b*c + 3*a*d)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3*i
*x^2 + 2*(a*b^3*c^2 - 2*a^2*b^2*c*d + a^3*b*d^2)*g^3*i*x + (a^2*b^2*c^2 - 2
*a^3*b*c*d + a^4*d^2)*g^3*i) + 2*d^2*log(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2*d
+ 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i) - 2*d^2*log(d*x + c)/((b^3*c^3 - 3*a*b^2
*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i))*log(e*(b*x/(d*x + c) + a/(d*x + c
))^n) - 1/4*(b^2*c^2 - 8*a*b*c*d + 7*a^2*d^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x
+ a^2*d^2)*log(b*x + a)^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(d*
x + c)^2 - 6*(b^2*c*d - a*b*d^2)*x - 6*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2
)*log(b*x + a) + 2*(3*b^2*d^2*x^2 + 6*a*b*d^2*x + 3*a^2*d^2 - 2*(b^2*d^2*x^
```

$$2 + 2*a*b*d^2*x + a^2*d^2)*\log(b*x + a))*\log(d*x + c))*B*n/(a^2*b^3*c^3*g^3*i - 3*a^3*b^2*c^2*d*g^3*i + 3*a^4*b*c*d^2*g^3*i - a^5*d^3*g^3*i + (b^5*c^3*g^3*i - 3*a*b^4*c^2*d*g^3*i + 3*a^2*b^3*c*d^2*g^3*i - a^3*b^2*d^3*g^3*i)*x^2 + 2*(a*b^4*c^3*g^3*i - 3*a^2*b^3*c^2*d*g^3*i + 3*a^3*b^2*c*d^2*g^3*i - a^4*b*d^3*g^3*i)*x) + 1/2*A*((2*b*d*x - b*c + 3*a*d)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3*i*x^2 + 2*(a*b^3*c^2 - 2*a^2*b^2*c*d + a^3*b*d^2)*g^3*i*x + (a^2*b^2*c^2 - 2*a^3*b*c*d + a^4*d^2)*g^3*i) + 2*d^2*\log(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i) - 2*d^2*\log(d*x + c)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i))$$

**Fricas [A]** time = 0.556775, size = 1023, normalized size = 3.85

$$2 A b^2 c^2 - 8 A a b c d + 6 A a^2 d^2 - 2 (B b^2 d^2 n x^2 + 2 B a b d^2 n x + B a^2 d^2 n) \log\left(\frac{b x + a}{d x + c}\right)^2 + (B b^2 c^2 - 8 B a b c d + 7 B a^2 d^2) n - 2$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^3/(d\*i\*x+c\*i),x, algorithm="fricas")

[Out]  $-1/4*(2*A*b^2*c^2 - 8*A*a*b*c*d + 6*A*a^2*d^2 - 2*(B*b^2*d^2*n*x^2 + 2*B*a*b*d^2*n*x + B*a^2*d^2*n)*\log((b*x + a)/(d*x + c))^2 + (B*b^2*c^2 - 8*B*a*b*c*d + 7*B*a^2*d^2)*n - 2*(2*A*b^2*c*d - 2*A*a*b*d^2 + 3*(B*b^2*c*d - B*a*b*d^2)*n)*x + 2*(B*b^2*c^2 - 4*B*a*b*c*d + 3*B*a^2*d^2 - 2*(B*b^2*c*d - B*a*b*d^2)*x - 2*(B*b^2*d^2*x^2 + 2*B*a*b*d^2*x + B*a^2*d^2)*\log((b*x + a)/(d*x + c)))*\log(e) - 2*(2*A*a^2*d^2 + (3*B*b^2*d^2*n + 2*A*b^2*d^2)*x^2 - (B*b^2*c^2 - 4*B*a*b*c*d)*n + 2*(2*A*a*b*d^2 + (B*b^2*c*d + 2*B*a*b*d^2)*n)*x)*\log((b*x + a)/(d*x + c)))/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^3*i*x^2 + 2*(a*b^4*c^3 - 3*a^2*b^3*c^2*d + 3*a^3*b^2*c*d^2 - a^4*b*d^3)*g^3*i*x + (a^2*b^3*c^3 - 3*a^3*b^2*c^2*d + 3*a^4*b*c*d^2 - a^5*d^3)*g^3*i)$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)\*\*3/(d\*i\*x+c\*i),x)

[Out] Timed out

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{B \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A}{(bgx + ag)^3 (dix + ci)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^3/(d\*i\*x+c\*i),x, algorithm="giac")

[Out] integrate((B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)/((b\*g\*x + a\*g)^3\*(d\*i\*x + c\*i)), x)



$$3.142 \quad \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^4(ci+dix)} dx$$

**Optimal.** Leaf size=389

$$\frac{3b^2d(c+dx)^2\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^4i(a+bx)^2(bc-ad)^4} - \frac{b^3(c+dx)^3\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3g^4i(a+bx)^3(bc-ad)^4} - \frac{d^3 \log\left(\frac{a+bx}{c+dx}\right)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^4i(bc-ad)^4}$$

[Out]  $(-3*b*B*d^2*n*(c+d*x))/((b*c-a*d)^4*g^4*i*(a+b*x)) + (3*b^2*B*d*n*(c+d*x)^2)/(4*(b*c-a*d)^4*g^4*i*(a+b*x)^2) - (b^3*B*n*(c+d*x)^3)/(9*(b*c-a*d)^4*g^4*i*(a+b*x)^3) - (3*b*d^2*(c+d*x)*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/((b*c-a*d)^4*g^4*i*(a+b*x)) + (3*b^2*d*(c+d*x)^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(2*(b*c-a*d)^4*g^4*i*(a+b*x)^2) - (b^3*(c+d*x)^3*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(3*(b*c-a*d)^4*g^4*i*(a+b*x)^3) - (d^3*(A+B*Log[e*((a+b*x)/(c+d*x))^n])*Log[(a+b*x)/(c+d*x)])/((b*c-a*d)^4*g^4*i) + (B*d^3*n*Log[(a+b*x)/(c+d*x)]^2)/(2*(b*c-a*d)^4*g^4*i)$

**Rubi [C]** time = 1.07713, antiderivative size = 646, normalized size of antiderivative = 1.66, number of steps used = 30, number of rules used = 11, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.256$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{Bd^3n \text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{g^4i(bc-ad)^4} - \frac{Bd^3n \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{g^4i(bc-ad)^4} - \frac{d^3 \log(a+bx)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^4i(bc-ad)^4} + \frac{d^3 \log(c+dx)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^4i(bc-ad)^4}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])/((a\*g + b\*g\*x)^4\*(c\*i + d\*i\*x)), x]

[Out]  $-(B*n)/(9*(b*c-a*d)*g^4*i*(a+b*x)^3) + (5*B*d*n)/(12*(b*c-a*d)^2*g^4*i*(a+b*x)^2) - (11*B*d^2*n)/(6*(b*c-a*d)^3*g^4*i*(a+b*x)) - (11*B*d^3*n*Log[a+b*x])/(6*(b*c-a*d)^4*g^4*i) + (B*d^3*n*Log[a+b*x]^2)/(2*(b*c-a*d)^4*g^4*i) - (A+B*Log[e*((a+b*x)/(c+d*x))^n])/(3*(b*c-a*d)*g^4*i*(a+b*x)^3) + (d*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(2*(b*c-a*d)^2*g^4*i*(a+b*x)^2) - (d^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/((b*c-a*d)^3*g^4*i*(a+b*x)) - (d^3*Log[a+b*x]*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/((b*c-a*d)^4*g^4*i) + (11*B*d^3*n*Log[c+d*x])/(6*(b*c-a*d)^4*g^4*i) - (B*d^3*n*Log[-((d*(a+b*x))/(b*c-a*d))]*Log[c+d*x])/((b*c-a*d)^4*g^4*i)$

$$\begin{aligned}
& - a*d)^4*g^4*i) + (d^3*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])* \text{Log}[c + d*x] \\
& )/((b*c - a*d)^4*g^4*i) + (B*d^3*n*\text{Log}[c + d*x]^2)/(2*(b*c - a*d)^4*g^4*i) \\
& - (B*d^3*n*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^4*i) \\
& - (B*d^3*n*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]/((b*c - a*d)^4*g^4*i) \\
& - (B*d^3*n*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^4*i)
\end{aligned}$$
Rule 2528

```

Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

```

Rule 2525

```

Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[
((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[
SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x], x] /; FreeQ[
{a, b, c, d, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

```

Rule 12

```

Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]

```

Rule 44

```

Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])

```

Rule 2524

```

Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[
(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /; FreeQ[
{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]

```

Rule 2418

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(Rfx_), x_Symbol] := With[
{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, Rfx, x]},

```

Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[  
RFx, x] && IntegerQ[p]

### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.  
)\*(x\_))^(q\_.), x\_Symbol] :> Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^  
n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E  
qQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] :> Simp[(a + b\*Lo  
g[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_  
)), x\_Symbol] :> Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x  
)^n]))/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x  
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_  
Symbol] :> Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x  
, x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*  
(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] :> -Simp[PolyLog[2  
, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rubi steps

$$\begin{aligned}
\int \frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(142c + 142dx)(ag + bgx)^4} dx &= \int \left( \frac{b\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{142(bc - ad)g^4(a + bx)^4} - \frac{bd\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{142(bc - ad)^2g^4(a + bx)^3} + \frac{bd^2\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{142(bc - ad)^3g^4(a + bx)^2} \right) dx \\
&= -\frac{(bd^3) \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx} dx}{142(bc - ad)^4g^4} + \frac{d^4 \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx} dx}{142(bc - ad)^4g^4} + \frac{(bd^2) \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^2} dx}{142(bc - ad)^3g^4} \\
&= -\frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{426(bc - ad)g^4(a + bx)^3} + \frac{d\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{284(bc - ad)^2g^4(a + bx)^2} - \frac{d^2\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{142(bc - ad)^3g^4(a + bx)} \\
&= -\frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{426(bc - ad)g^4(a + bx)^3} + \frac{d\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{284(bc - ad)^2g^4(a + bx)^2} - \frac{d^2\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{142(bc - ad)^3g^4(a + bx)} \\
&= -\frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{426(bc - ad)g^4(a + bx)^3} + \frac{d\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{284(bc - ad)^2g^4(a + bx)^2} - \frac{d^2\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{142(bc - ad)^3g^4(a + bx)} \\
&= -\frac{Bn}{1278(bc - ad)g^4(a + bx)^3} + \frac{5Bdn}{1704(bc - ad)^2g^4(a + bx)^2} - \frac{11Bd^2n}{852(bc - ad)^3g^4(a + bx)} \\
&= -\frac{Bn}{1278(bc - ad)g^4(a + bx)^3} + \frac{5Bdn}{1704(bc - ad)^2g^4(a + bx)^2} - \frac{11Bd^2n}{852(bc - ad)^3g^4(a + bx)} \\
&= -\frac{Bn}{1278(bc - ad)g^4(a + bx)^3} + \frac{5Bdn}{1704(bc - ad)^2g^4(a + bx)^2} - \frac{11Bd^2n}{852(bc - ad)^3g^4(a + bx)}
\end{aligned}$$

**Mathematica [C]** time = 0.754456, size = 518, normalized size = 1.33

$$-36Bd^3n \text{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) - 36Bd^3n \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right) + \frac{36Ad^2(ad-bc)}{a+bx} + \frac{18Ad(bc-ad)^2}{(a+bx)^2} - \frac{12A(bc-ad)^3}{(a+bx)^3} - 36Ad^3 \log(a + bx)$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])/((a\*g + b\*g\*x)^4\*(c\*i + d\*i\*x)), x]

```
[Out] ((-12*A*(b*c - a*d)^3)/(a + b*x)^3 - (4*B*(b*c - a*d)^3*n)/(a + b*x)^3 + (1
8*A*d*(b*c - a*d)^2)/(a + b*x)^2 + (15*B*d*(b*c - a*d)^2*n)/(a + b*x)^2 + (
36*A*d^2*(-(b*c) + a*d))/(a + b*x) + (66*B*d^2*(-(b*c) + a*d)*n)/(a + b*x)
- 36*A*d^3*Log[a + b*x] - 66*B*d^3*n*Log[a + b*x] + 18*B*d^3*n*Log[a + b*x]
^2 - (12*B*(b*c - a*d)^3*Log[e*((a + b*x)/(c + d*x))^n])/(a + b*x)^3 + (18*
B*d*(b*c - a*d)^2*Log[e*((a + b*x)/(c + d*x))^n])/(a + b*x)^2 + (36*B*d^2*(-
(b*c) + a*d)*Log[e*((a + b*x)/(c + d*x))^n])/(a + b*x) - 36*B*d^3*Log[a +
b*x]*Log[e*((a + b*x)/(c + d*x))^n] + 36*A*d^3*Log[c + d*x] + 66*B*d^3*n*Lo
g[c + d*x] - 36*B*d^3*n*Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[c + d*x] + 36
*B*d^3*Log[e*((a + b*x)/(c + d*x))^n]*Log[c + d*x] + 18*B*d^3*n*Log[c + d*x
]^2 - 36*B*d^3*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] - 36*B*d^3*n*P
olyLog[2, (d*(a + b*x))/(-(b*c) + a*d)] - 36*B*d^3*n*PolyLog[2, (b*(c + d*x
))/(b*c - a*d)]/(36*(b*c - a*d)^4*g^4*i)
```

**Maple [F]** time = 0.773, size = 0, normalized size = 0.

$$\int \frac{1}{(bgx + ag)^4 (dix + ci)} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i),x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i),x)
```

**Maxima [B]** time = 1.79299, size = 1987, normalized size = 5.11

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i),x, alg
orithm="maxima")
```

```
[Out] -1/6*B*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d -
5*a*b*d^2)*x)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^
4*i*x^3 + 3*(a*b^5*c^3 - 3*a^2*b^4*c^2*d + 3*a^3*b^3*c*d^2 - a^4*b^2*d^3)*g
^4*i*x^2 + 3*(a^2*b^4*c^3 - 3*a^3*b^3*c^2*d + 3*a^4*b^2*c*d^2 - a^5*b*d^3)*
g^4*i*x + (a^3*b^3*c^3 - 3*a^4*b^2*c^2*d + 3*a^5*b*c*d^2 - a^6*d^3)*g^4*i)
```

$$\begin{aligned}
& + 6*d^3*\log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3* \\
& b*c*d^3 + a^4*d^4)*g^{4*i}) - 6*d^3*\log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d + \\
& 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^{4*i}))*\log(e*(b*x/(d*x + c) + \\
& a/(d*x + c))^n) - 1/36*(4*b^3*c^3 - 27*a*b^2*c^2*d + 108*a^2*b*c*d^2 - 85* \\
& a^3*d^3 + 66*(b^3*c*d^2 - a*b^2*d^3)*x^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^ \\
& 2 + 3*a^2*b*d^3*x + a^3*d^3)*\log(b*x + a)^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3 \\
& *x^2 + 3*a^2*b*d^3*x + a^3*d^3)*\log(d*x + c)^2 - 3*(5*b^3*c^2*d - 54*a*b^2* \\
& c*d^2 + 49*a^2*b*d^3)*x + 66*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x \\
& + a^3*d^3)*\log(b*x + a) - 6*(11*b^3*d^3*x^3 + 33*a*b^2*d^3*x^2 + 33*a^2*b* \\
& d^3*x + 11*a^3*d^3 - 6*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3 \\
& *d^3)*\log(b*x + a))*\log(d*x + c))*B^n/(a^3*b^4*c^4*g^{4*i} - 4*a^4*b^3*c^3*d* \\
& g^{4*i} + 6*a^5*b^2*c^2*d^2*g^{4*i} - 4*a^6*b*c*d^3*g^{4*i} + a^7*d^4*g^{4*i} + (b^ \\
& 7*c^4*g^{4*i} - 4*a*b^6*c^3*d*g^{4*i} + 6*a^2*b^5*c^2*d^2*g^{4*i} - 4*a^3*b^4*c*d \\
& ^3*g^{4*i} + a^4*b^3*d^4*g^{4*i})*x^3 + 3*(a*b^6*c^4*g^{4*i} - 4*a^2*b^5*c^3*d*g^ \\
& 4*i + 6*a^3*b^4*c^2*d^2*g^{4*i} - 4*a^4*b^3*c*d^3*g^{4*i} + a^5*b^2*d^4*g^{4*i})* \\
& x^2 + 3*(a^2*b^5*c^4*g^{4*i} - 4*a^3*b^4*c^3*d*g^{4*i} + 6*a^4*b^3*c^2*d^2*g^{4* \\
& i} - 4*a^5*b^2*c*d^3*g^{4*i} + a^6*b*d^4*g^{4*i})*x) - 1/6*A*((6*b^2*d^2*x^2 + 2 \\
& *b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^3 - \\
& 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^{4*i}*x^3 + 3*(a*b^5*c^3 - 3 \\
& *a^2*b^4*c^2*d + 3*a^3*b^3*c*d^2 - a^4*b^2*d^3)*g^{4*i}*x^2 + 3*(a^2*b^4*c^3 \\
& - 3*a^3*b^3*c^2*d + 3*a^4*b^2*c*d^2 - a^5*b*d^3)*g^{4*i}*x + (a^3*b^3*c^3 - 3 \\
& *a^4*b^2*c^2*d + 3*a^5*b*c*d^2 - a^6*d^3)*g^{4*i}) + 6*d^3*\log(b*x + a)/((b^4 \\
& *c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^{4*i}) \\
& - 6*d^3*\log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3* \\
& b*c*d^3 + a^4*d^4)*g^{4*i})
\end{aligned}$$

**Fricas [B]** time = 0.599218, size = 1809, normalized size = 4.65

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^4/(d\*i\*x+c\*i),x, alg  
 orithm="fricas")

[Out] -1/36\*(12\*A\*b^3\*c^3 - 54\*A\*a\*b^2\*c^2\*d + 108\*A\*a^2\*b\*c\*d^2 - 66\*A\*a^3\*d^3 +  
 6\*(6\*A\*b^3\*c\*d^2 - 6\*A\*a\*b^2\*d^3 + 11\*(B\*b^3\*c\*d^2 - B\*a\*b^2\*d^3)\*n)\*x^2 +  
 18\*(B\*b^3\*d^3\*n\*x^3 + 3\*B\*a\*b^2\*d^3\*n\*x^2 + 3\*B\*a^2\*b\*d^3\*n\*x + B\*a^3\*d^3\*  
 n)\*log((b\*x + a)/(d\*x + c))^2 + (4\*B\*b^3\*c^3 - 27\*B\*a\*b^2\*c^2\*d + 108\*B\*a^2\*  
 \*b\*c\*d^2 - 85\*B\*a^3\*d^3)\*n - 3\*(6\*A\*b^3\*c^2\*d - 36\*A\*a\*b^2\*c\*d^2 + 30\*A\*a^2\*  
 \*b\*d^3 + (5\*B\*b^3\*c^2\*d - 54\*B\*a\*b^2\*c\*d^2 + 49\*B\*a^2\*b\*d^3)\*n)\*x + 6\*(2\*B\*  
 b^3\*c^3 - 9\*B\*a\*b^2\*c^2\*d + 18\*B\*a^2\*b\*c\*d^2 - 11\*B\*a^3\*d^3 + 6\*(B\*b^3\*c\*d^

$$2 - B*a*b^2*d^3)*x^2 - 3*(B*b^3*c^2*d - 6*B*a*b^2*c*d^2 + 5*B*a^2*b*d^3)*x + 6*(B*b^3*d^3*x^3 + 3*B*a*b^2*d^3*x^2 + 3*B*a^2*b*d^3*x + B*a^3*d^3)*\log((b*x + a)/(d*x + c))\log(e) + 6*(6*A*a^3*d^3 + (11*B*b^3*d^3*n + 6*A*b^3*d^3)*x^3 + 3*(6*A*a*b^2*d^3 + (2*B*b^3*c*d^2 + 9*B*a*b^2*d^3)*n)*x^2 + (2*B*b^3*c^3 - 9*B*a*b^2*c^2*d + 18*B*a^2*b*c*d^2)*n + 3*(6*A*a^2*b*d^3 - (B*b^3*c^2*d - 6*B*a*b^2*c*d^2 - 6*B*a^2*b*d^3)*n)*x)*\log((b*x + a)/(d*x + c))/((b^7*c^4 - 4*a*b^6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4*a^3*b^4*c*d^3 + a^4*b^3*d^4)*g^4*i*x^3 + 3*(a*b^6*c^4 - 4*a^2*b^5*c^3*d + 6*a^3*b^4*c^2*d^2 - 4*a^4*b^3*c*d^3 + a^5*b^2*d^4)*g^4*i*x^2 + 3*(a^2*b^5*c^4 - 4*a^3*b^4*c^3*d + 6*a^4*b^3*c^2*d^2 - 4*a^5*b^2*c*d^3 + a^6*b*d^4)*g^4*i*x + (a^3*b^4*c^4 - 4*a^4*b^3*c^3*d + 6*a^5*b^2*c^2*d^2 - 4*a^6*b*c*d^3 + a^7*d^4)*g^4*i)$$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n)))/(b\*g\*x+a\*g)\*\*4/(d\*i\*x+c\*i),x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A}{(bgx + ag)^4 (dix + ci)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n)))/(b\*g\*x+a\*g)^4/(d\*i\*x+c\*i),x, algorithm="giac")

[Out] integrate((B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)/((b\*g\*x + a\*g)^4\*(d\*i\*x + c\*i)), x)

$$3.143 \quad \int \frac{(ag+bgx)^3 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ci+dix)^2} dx$$

**Optimal.** Leaf size=359

$$\frac{3bBg^3n(bc-ad)^2 \text{PolyLog} \left( 2, \frac{d(a+bx)}{b(c+dx)} \right)}{d^4i^2} - \frac{g^3(a+bx)^2(bc-ad) \left( 3B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + 3A + Bn \right)}{2d^2i^2(c+dx)} - \frac{bg^3(bc-ad)^2 \log \left( \frac{bc-ad}{b(c+dx)} \right)}{d^4i^2}$$

[Out]  $(3*B*(b*c - a*d)^2*g^3*n*(a + b*x))/(d^3*i^2*(c + d*x)) - ((b*c - a*d)^2*g^3*(6*A + 5*B*n)*(a + b*x))/(2*d^3*i^2*(c + d*x)) - (3*B*(b*c - a*d)^2*g^3*(a + b*x)*\text{Log}[e*((a + b*x)/(c + d*x))^n]/(d^3*i^2*(c + d*x)) + (g^3*(a + b*x)^3*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])/(2*d*i^2*(c + d*x)) - ((b*c - a*d)*g^3*(a + b*x)^2*(3*A + B*n + 3*B*\text{Log}[e*((a + b*x)/(c + d*x))^n])/(2*d^2*i^2*(c + d*x)) - (b*(b*c - a*d)^2*g^3*(6*A + 5*B*n + 6*B*\text{Log}[e*((a + b*x)/(c + d*x))^n])*\text{Log}[(b*c - a*d)/(b*(c + d*x))]/(2*d^4*i^2) - (3*b*B*(b*c - a*d)^2*g^3*n*\text{PolyLog}[2, (d*(a + b*x))/(b*(c + d*x))]/(d^4*i^2)$

**Rubi [A]** time = 0.727243, antiderivative size = 541, normalized size of antiderivative = 1.51, number of steps used = 21, number of rules used = 14, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.326$ , Rules used = {2528, 2486, 31, 2525, 12, 72, 44, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{3bBg^3n(bc-ad)^2 \text{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right)}{d^4i^2} - \frac{a^2bBg^3n \log(a+bx)}{2d^2i^2} + \frac{b^3g^3x^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{2d^2i^2} - \frac{Ab^2g^3x(2bc-3ad)}{d^3i^2}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[\frac{((a*g + b*g*x)^3*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])}{(c*i + d*i*x)^2}, x]$

[Out]  $-((A*b^2*(2*b*c - 3*a*d)*g^3*x)/(d^3*i^2)) - (b^2*B*(b*c - a*d)*g^3*n*x)/(2*d^3*i^2) - (B*(b*c - a*d)^3*g^3*n)/(d^4*i^2*(c + d*x)) - (a^2*b*B*g^3*n*\text{Log}[a + b*x]/(2*d^2*i^2) - (b*B*(b*c - a*d)^2*g^3*n*\text{Log}[a + b*x]/(d^4*i^2) - (b*B*(2*b*c - 3*a*d)*g^3*(a + b*x)*\text{Log}[e*((a + b*x)/(c + d*x))^n]/(d^3*i^2) + (b^3*g^3*x^2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])/(2*d^2*i^2) + ((b*c - a*d)^3*g^3*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])/(d^4*i^2*(c + d*x)) + (b^3*B*c^2*g^3*n*\text{Log}[c + d*x]/(2*d^4*i^2) + (b*B*(2*b*c - 3*a*d)*(b*c - a*d)*g^3*n*\text{Log}[c + d*x]/(d^4*i^2) + (b*B*(b*c - a*d)^2*g^3*n*\text{Log}[c + d*x])/d^4*i^2) - (3*b*B*(b*c - a*d)^2*g^3*n*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]$



$$\frac{\text{Log}[c + d*x]}{(d^4*i^2)} + \frac{(3*b*(b*c - a*d)^2*g^3*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])*\text{Log}[c + d*x]}{(d^4*i^2)} + \frac{(3*b*B*(b*c - a*d)^2*g^3*n*\text{Log}[c + d*x]^2)}{(2*d^4*i^2)} - \frac{(3*b*B*(b*c - a*d)^2*g^3*n*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]}{(d^4*i^2)}$$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFX^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFX, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q]^r]^s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

### Rule 31

```
Int[((a_.) + (b_.)*(x_))^(n_.), x_Symbol] := Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFX^p])^n - 1)*D[RFX, x])/RFX, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
x_Symbol] := Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
/; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(Rfx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, Rfx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
Rfx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)
]^n))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
```

qQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] :> Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rubi steps

$$\begin{aligned}
 \int \frac{(ag + bgx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(143c + 143dx)^2} dx &= \int \left( -\frac{b^2(2bc - 3ad)g^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{20449d^3} + \frac{b^3g^3x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{20449d^2} \right) dx \\
 &= \frac{(b^3g^3) \int x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx}{20449d^2} - \frac{(b^2(2bc - 3ad)g^3) \int \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx}{20449d^3} \\
 &= -\frac{Ab^2(2bc - 3ad)g^3x}{20449d^3} + \frac{b^3g^3x^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{40898d^2} + \frac{(bc - ad)^3g^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{20449d^3} \\
 &= -\frac{Ab^2(2bc - 3ad)g^3x}{20449d^3} - \frac{bB(2bc - 3ad)g^3(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{20449d^3} + \frac{b^3g^3x^2}{20449d^3} \\
 &= -\frac{Ab^2(2bc - 3ad)g^3x}{20449d^3} - \frac{bB(2bc - 3ad)g^3(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{20449d^3} + \frac{b^3g^3x^2}{20449d^3} \\
 &= -\frac{Ab^2(2bc - 3ad)g^3x}{20449d^3} - \frac{b^2B(bc - ad)g^3nx}{40898d^3} - \frac{B(bc - ad)^3g^3n}{20449d^4(c + dx)} - \frac{a^2bBg^3n \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{40898d^3} \\
 &= -\frac{Ab^2(2bc - 3ad)g^3x}{20449d^3} - \frac{b^2B(bc - ad)g^3nx}{40898d^3} - \frac{B(bc - ad)^3g^3n}{20449d^4(c + dx)} - \frac{a^2bBg^3n \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{40898d^3} \\
 &= -\frac{Ab^2(2bc - 3ad)g^3x}{20449d^3} - \frac{b^2B(bc - ad)g^3nx}{40898d^3} - \frac{B(bc - ad)^3g^3n}{20449d^4(c + dx)} - \frac{a^2bBg^3n \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{40898d^3}
 \end{aligned}$$

**Mathematica [A]** time = 0.440093, size = 375, normalized size = 1.04

$$g^3 \left( -3bBn(bc - ad)^2 \left( 2\text{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right) + \log(c + dx) \left( 2 \log \left( \frac{d(a+bx)}{ad-bc} \right) - \log(c + dx) \right) \right) + bBn \left( b(dx(ad - bc) + bc^2 \log \right) \right)$$


---

Antiderivative was successfully verified.

[In] Integrate[((a\*g + b\*g\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(c\*i + d\*i\*x)^2,x]

[Out] (g^3\*(-2\*A\*b^2\*d\*(2\*b\*c - 3\*a\*d)\*x - 2\*b\*B\*d\*(2\*b\*c - 3\*a\*d)\*(a + b\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n] + b^3\*d^2\*x^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + (2\*(b\*c - a\*d)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(c + d\*x) + 2\*b\*B\*(2\*b\*c - 3\*a\*d)\*(b\*c - a\*d)\*n\*Log[c + d\*x] + 6\*b\*(b\*c - a\*d)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[c + d\*x] - 2\*B\*(b\*c - a\*d)^2\*n\*((b\*c - a\*d)/(c + d\*x) + b\*Log[a + b\*x] - b\*Log[c + d\*x]) + b\*B\*n\*(-(a^2\*d^2\*Log[a + b\*x]) + b\*(d\*(-(b\*c) + a\*d)\*x + b\*c^2\*Log[c + d\*x])) - 3\*b\*B\*(b\*c - a\*d)^2\*n\*((2\*Log[(d\*(a + b\*x))/(-b\*c) + a\*d]) - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])))/(2\*d^4\*i^2)

---

**Maple [F]** time = 0.66, size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^3}{(dix + ci)^2} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)^2,x)

[Out] int((b\*g\*x+a\*g)^3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)^2,x)

---

**Maxima [B]** time = 2.63196, size = 2554, normalized size = 7.11

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)^2,x, a  
lgorithm="maxima")

[Out]  $B*a^3*g^3*n*(1/(d^2*i^2*x + c*d*i^2) + b*\log(b*x + a)/((b*c*d - a*d^2)*i^2) - b*\log(d*x + c)/((b*c*d - a*d^2)*i^2)) + 1/2*(2*c^3/(d^5*i^2*x + c*d^4*i^2) + 6*c^2*\log(d*x + c)/(d^4*i^2) + (d*x^2 - 4*c*x)/(d^3*i^2))*A*b^3*g^3 - 3*A*a*b^2*(c^2/(d^4*i^2*x + c*d^3*i^2) - x/(d^2*i^2) + 2*c*\log(d*x + c)/(d^3*i^2))*g^3 + 3*A*a^2*b*g^3*(c/(d^3*i^2*x + c*d^2*i^2) + \log(d*x + c)/(d^2*i^2)) - B*a^3*g^3*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(d^2*i^2*x + c*d*i^2) - A*a^3*g^3/(d^2*i^2*x + c*d*i^2) - 1/2*(6*a^3*b*d^3*g^3*\log(e) - (7*g^3*n + 6*g^3*\log(e))*b^4*c^3 + (17*g^3*n + 18*g^3*\log(e))*a*b^3*c^2*d - 6*(2*g^3*n + 3*g^3*\log(e))*a^2*b^2*c*d^2)*B*\log(d*x + c)/(b*c*d^4*i^2 - a*d^5*i^2) + 1/2*((b^4*c*d^3*g^3*\log(e) - a*b^3*d^4*g^3*\log(e))*B*x^3 - ((g^3*n + 3*g^3*\log(e))*b^4*c^2*d^2 - (2*g^3*n + 9*g^3*\log(e))*a*b^3*c*d^3 + (g^3*n + 6*g^3*\log(e))*a^2*b^2*d^4)*B*x^2 - ((g^3*n + 4*g^3*\log(e))*b^4*c^3*d - 2*(g^3*n + 5*g^3*\log(e))*a*b^3*c^2*d^2 + (g^3*n + 6*g^3*\log(e))*a^2*b^2*c*d^3)*B*x - 6*((b^4*c^3*d*g^3*n - 3*a*b^3*c^2*d^2*g^3*n + 3*a^2*b^2*c*d^3*g^3*n - a^3*b*d^4*g^3*n)*B*x + (b^4*c^4*g^3*n - 3*a*b^3*c^3*d*g^3*n + 3*a^2*b^2*c^2*d^2*g^3*n - a^3*b*c*d^3*g^3*n)*B)*\log(b*x + a)*\log(d*x + c) + 3*((b^4*c^3*d*g^3*n - 3*a*b^3*c^2*d^2*g^3*n + 3*a^2*b^2*c*d^3*g^3*n - a^3*b*d^4*g^3*n)*B*x + (b^4*c^4*g^3*n - 3*a*b^3*c^3*d*g^3*n + 3*a^2*b^2*c^2*d^2*g^3*n - a^3*b*c*d^3*g^3*n)*B)*\log(d*x + c)^2 - 2*((g^3*n - g^3*\log(e))*b^4*c^4 - 4*(g^3*n - g^3*\log(e))*a*b^3*c^3*d + 6*(g^3*n - g^3*\log(e))*a^2*b^2*c^2*d^2 - 3*(g^3*n - g^3*\log(e))*a^3*b*c*d^3)*B - ((2*b^4*c^3*d*g^3*n - 2*a*b^3*c^2*d^2*g^3*n - 3*a^2*b^2*c*d^3*g^3*n + 5*a^3*b*d^4*g^3*n)*B*x + (2*b^4*c^4*g^3*n - 2*a*b^3*c^3*d*g^3*n - 3*a^2*b^2*c^2*d^2*g^3*n + 5*a^3*b*c*d^3*g^3*n)*B)*\log(b*x + a) + ((b^4*c*d^3*g^3 - a*b^3*d^4*g^3)*B*x^3 - 3*(b^4*c^2*d^2*g^3 - 3*a*b^3*c*d^3*g^3 + 2*a^2*b^2*d^4*g^3)*B*x^2 - 2*(2*b^4*c^3*d*g^3 - 5*a*b^3*c^2*d^2*g^3 + 3*a^2*b^2*c*d^3*g^3)*B*x + 2*(b^4*c^4*g^3 - 4*a*b^3*c^3*d*g^3 + 6*a^2*b^2*c^2*d^2*g^3 - 3*a^3*b*c*d^3*g^3)*B + 6*((b^4*c^3*d*g^3 - 3*a*b^3*c^2*d^2*g^3 + 3*a^2*b^2*c*d^3*g^3 - a^3*b*d^4*g^3)*B*x + (b^4*c^4*g^3 - 3*a*b^3*c^3*d*g^3 + 3*a^2*b^2*c^2*d^2*g^3 - a^3*b*c*d^3*g^3)*B)*\log(d*x + c))*\log((b*x + a)^n) - ((b^4*c*d^3*g^3 - a*b^3*d^4*g^3)*B*x^3 - 3*(b^4*c^2*d^2*g^3 - 3*a*b^3*c*d^3*g^3 + 2*a^2*b^2*d^4*g^3)*B*x^2 - 2*(2*b^4*c^3*d*g^3 - 5*a*b^3*c^2*d^2*g^3 + 3*a^2*b^2*c*d^3*g^3)*B*x + 2*(b^4*c^4*g^3 - 4*a*b^3*c^3*d*g^3 + 6*a^2*b^2*c^2*d^2*g^3 - 3*a^3*b*c*d^3*g^3)*B + 6*((b^4*c^3*d*g^3 - 3*a*b^3*c^2*d^2*g^3 + 3*a^2*b^2*c*d^3*g^3 - a^3*b*d^4*g^3)*B*x + (b^4*c^4*g^3 - 3*a*b^3*c^3*d*g^3 + 3*a^2*b^2*c^2*d^2*g^3 - a^3*b*c*d^3*g^3)*B)*\log(d*x + c))*\log((d*x + c)^n))/(b*c^2*d^4*i^2 - a*c*d^5*i^2 + (b*c*d^5*i^2 - a*d^6*i^2)*x) + 3*(b^3*c^2*g^3*n - 2*a*b^2*c*d*g^3*n + a^2*b*d^2*g^3*n)*(\log(b*x + a)*\log((b*d*x + a*d)/(b*c - a*d) + 1) + \operatorname{dilog}(-(b*d*x + a*d)/(b*c - a*d)))*B/(d^4*i^2)$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{Ab^3g^3x^3 + 3Aab^2g^3x^2 + 3Aa^2bg^3x + Aa^3g^3 + \left(Bb^3g^3x^3 + 3Bab^2g^3x^2 + 3Ba^2bg^3x + Ba^3g^3\right) \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}{d^2i^2x^2 + 2cdi^2x + c^2i^2}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)^2,x, algorithm="fricas")

[Out] integral((A\*b^3\*g^3\*x^3 + 3\*A\*a\*b^2\*g^3\*x^2 + 3\*A\*a^2\*b\*g^3\*x + A\*a^3\*g^3 + (B\*b^3\*g^3\*x^3 + 3\*B\*a\*b^2\*g^3\*x^2 + 3\*B\*a^2\*b\*g^3\*x + B\*a^3\*g^3)\*log(e\*((b\*x + a)/(d\*x + c))^n))/(d^2\*i^2\*x^2 + 2\*c\*d\*i^2\*x + c^2\*i^2), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*\*3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n))/(d\*i\*x+c\*i)\*\*2,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^3 \left( B \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A \right)}{(dix + ci)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)^2,x, algorithm="giac")

[Out] integrate((b\*g\*x + a\*g)^3\*(B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)/(d\*i\*x + c\*i)^2, x)

$$3.144 \quad \int \frac{(ag+bgx)^2 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ci+dix)^2} dx$$

**Optimal.** Leaf size=275

$$\frac{2bBg^2n(bc-ad)\text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)}{d^3i^2} + \frac{bg^2(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(2B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+2A+Bn\right)}{d^3i^2} + \frac{g^2(a+bx)(2A+Bn)}{d^2i^2(c+dx)}$$

[Out]  $(-2*B*(b*c - a*d)*g^{2*n}*(a + b*x))/(d^{2*i^2}*(c + d*x)) + ((b*c - a*d)*g^{2*(2*A + B*n)}*(a + b*x))/(d^{2*i^2}*(c + d*x)) + (2*B*(b*c - a*d)*g^{2*(a + b*x)}*\text{Log}[e*((a + b*x)/(c + d*x))^n])/(d^{2*i^2}*(c + d*x)) + (g^{2*(a + b*x)^2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])})/(d*i^2*(c + d*x)) + (b*(b*c - a*d)*g^{2*(2*A + B*n + 2*B*\text{Log}[e*((a + b*x)/(c + d*x))^n])}*\text{Log}[(b*c - a*d)/(b*(c + d*x))])/(d^3*i^2) + (2*b*B*(b*c - a*d)*g^{2*n}*\text{PolyLog}[2, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i^2)$

**Rubi [A]** time = 0.532204, antiderivative size = 351, normalized size of antiderivative = 1.28, number of steps used = 17, number of rules used = 13, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.302$ , Rules used = {2528, 2486, 31, 2525, 12, 44, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{2bBg^2n(bc-ad)\text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{d^3i^2} - \frac{g^2(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^3i^2(c+dx)} - \frac{2bg^2(bc-ad)\log(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A+Bn\right)}{d^3i^2}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[(a*g + b*g*x)^2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])]/(c*i + d*i*x)^2, x]$

[Out]  $(A*b^{2*g^{2*x}})/(d^{2*i^2}) + (B*(b*c - a*d)^2*g^{2*n})/(d^3*i^2*(c + d*x)) + (b*B*(b*c - a*d)*g^{2*n}*\text{Log}[a + b*x])/(d^3*i^2) + (b*B*g^{2*(a + b*x)}*\text{Log}[e*((a + b*x)/(c + d*x))^n])/(d^{2*i^2}) - ((b*c - a*d)^2*g^{2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])})/(d^3*i^2*(c + d*x)) - (2*b*B*(b*c - a*d)*g^{2*n}*\text{Log}[c + d*x])/(d^3*i^2) + (2*b*B*(b*c - a*d)*g^{2*n}*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/(d^3*i^2) - (2*b*(b*c - a*d)*g^{2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])}*\text{Log}[c + d*x])/(d^3*i^2) - (b*B*(b*c - a*d)*g^{2*n}*\text{Log}[c + d*x]^2)/(d^3*i^2) + (2*b*B*(b*c - a*d)*g^{2*n}*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])/(d^3*i^2)$

**Rule 2528**

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.)
^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)
^q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q]^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

### Rule 31

```
Int[((a_) + (b_.)*(x_))^(n_), x_Symbol] := Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /;
```



FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

### Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*(RFx\_), x\_Symbol] :> With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n]^p, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]

### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :> Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n]))/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :> Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]/(x\_), x\_Symbol] :> -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_.) + (g\_.)\*(x\_))^(q\_.), x\_Symbol] :> Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_))^(n\_.)]\*(b\_.)/(x\_), x\_Symbol] :> Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rubi steps

$$\begin{aligned}
\int \frac{(ag + bgx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(144c + 144dx)^2} dx &= \int \left( \frac{b^2 g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{20736d^2} + \frac{(-bc + ad)^2 g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{20736d^2 (c + dx)^2} \right) dx \\
&= \frac{(b^2 g^2) \int \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx}{20736d^2} - \frac{(b(bc - ad)g^2) \int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{c+dx} dx}{10368d^2} \\
&= \frac{Ab^2 g^2 x}{20736d^2} - \frac{(bc - ad)^2 g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{20736d^3 (c + dx)} - \frac{b(bc - ad)g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{10368d^2} \\
&= \frac{Ab^2 g^2 x}{20736d^2} + \frac{bB g^2 (a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{20736d^2} - \frac{(bc - ad)^2 g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{20736d^3 (c + dx)} \\
&= \frac{Ab^2 g^2 x}{20736d^2} + \frac{bB g^2 (a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{20736d^2} - \frac{(bc - ad)^2 g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{20736d^3 (c + dx)} \\
&= \frac{Ab^2 g^2 x}{20736d^2} + \frac{B(bc - ad)^2 g^2 n}{20736d^3 (c + dx)} + \frac{bB(bc - ad)g^2 n \log(a + bx)}{20736d^3} + \frac{bB g^2 (a + bx)}{20736d^2} \\
&= \frac{Ab^2 g^2 x}{20736d^2} + \frac{B(bc - ad)^2 g^2 n}{20736d^3 (c + dx)} + \frac{bB(bc - ad)g^2 n \log(a + bx)}{20736d^3} + \frac{bB g^2 (a + bx)}{20736d^2} \\
&= \frac{Ab^2 g^2 x}{20736d^2} + \frac{B(bc - ad)^2 g^2 n}{20736d^3 (c + dx)} + \frac{bB(bc - ad)g^2 n \log(a + bx)}{20736d^3} + \frac{bB g^2 (a + bx)}{20736d^2}
\end{aligned}$$

**Mathematica [A]** time = 0.258648, size = 252, normalized size = 0.92

$$g^2 \left( bBn(bc - ad) \left( 2 \text{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right) + \log(c + dx) \left( 2 \log \left( \frac{d(a+bx)}{ad-bc} \right) - \log(c + dx) \right) \right) - 2b(bc - ad) \log(c + dx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) \right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c*i + d*i*x)^2,x]
```

```
[Out] (g^2*(A*b^2*d*x + (B*(b*c - a*d)^2*n)/(c + d*x) + b*B*(b*c - a*d)*n*Log[a + b*x] + b*B*d*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] - ((b*c - a*d)^2*(A
```

+ B\*Log[e\*((a + b\*x)/(c + d\*x))^n]/(c + d\*x) - 2\*b\*B\*(b\*c - a\*d)\*n\*Log[c + d\*x] - 2\*b\*(b\*c - a\*d)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[c + d\*x] + b\*B\*(b\*c - a\*d)\*n\*((2\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)] - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])))/(d^3\*i^2)

**Maple [F]** time = 0.695, size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^2}{(dix + ci)^2} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)^2,x)

[Out] int((b\*g\*x+a\*g)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)^2,x)

**Maxima [B]** time = 2.57898, size = 1719, normalized size = 6.25

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)^2,x, algorithm="maxima")

[Out] B\*a^2\*g^2\*n\*(1/(d^2\*i^2\*x + c\*d\*i^2) + b\*log(b\*x + a)/((b\*c\*d - a\*d^2)\*i^2) - b\*log(d\*x + c)/((b\*c\*d - a\*d^2)\*i^2)) - A\*b^2\*(c^2/(d^4\*i^2\*x + c\*d^3\*i^2) - x/(d^2\*i^2) + 2\*c\*log(d\*x + c)/(d^3\*i^2))\*g^2 + 2\*A\*a\*b\*g^2\*(c/(d^3\*i^2\*x + c\*d^2\*i^2) + log(d\*x + c)/(d^2\*i^2)) - B\*a^2\*g^2\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n)/(d^2\*i^2\*x + c\*d\*i^2) - A\*a^2\*g^2/(d^2\*i^2\*x + c\*d\*i^2) - (2\*a^2\*b\*d^2\*g^2\*log(e) + 2\*(g^2\*n + g^2\*log(e))\*b^3\*c^2 - (3\*g^2\*n + 4\*g^2\*log(e))\*a\*b^2\*c\*d)\*B\*log(d\*x + c)/(b\*c\*d^3\*i^2 - a\*d^4\*i^2) + ((b^3\*c\*d^2\*g^2\*log(e) - a\*b^2\*d^3\*g^2\*log(e))\*B\*x^2 + (b^3\*c^2\*d\*g^2\*log(e) - a\*b^2\*c\*d^2\*g^2\*log(e))\*B\*x + 2\*((b^3\*c^2\*d\*g^2\*n - 2\*a\*b^2\*c\*d^2\*g^2\*n + a^2\*b\*d^3\*g^2\*n)\*B\*x + (b^3\*c^3\*g^2\*n - 2\*a\*b^2\*c^2\*d\*g^2\*n + a^2\*b\*c\*d^2\*g^2\*n)\*B)\*log(b\*x + a)\*log(d\*x + c) - ((b^3\*c^2\*d\*g^2\*n - 2\*a\*b^2\*c\*d^2\*g^2\*n + a^2\*b\*d^3\*g^2\*n)\*B\*x + (b^3\*c^3\*g^2\*n - 2\*a\*b^2\*c^2\*d\*g^2\*n + a^2\*b\*c\*d^2\*g^2\*n)\*B)\*log(d\*x + c)^2 + ((g^2\*n - g^2\*log(e))\*b^3\*c^3 - 3\*(g^2\*n - g^2\*log(e))\*a\*b^2\*c^2\*d + 2\*(g^2\*n - g^2\*log(e))\*a^2\*b\*c\*d^2)\*B + ((b^3\*c^2\*d\*g^2\*n

- a\*b^2\*c\*d^2\*g^2\*n - a^2\*b\*d^3\*g^2\*n)\*B\*x + (b^3\*c^3\*g^2\*n - a\*b^2\*c^2\*d\*g^2\*n - a^2\*b\*c\*d^2\*g^2\*n)\*B)\*log(b\*x + a) + ((b^3\*c\*d^2\*g^2 - a\*b^2\*d^3\*g^2)\*B\*x^2 + (b^3\*c^2\*d\*g^2 - a\*b^2\*c\*d^2\*g^2)\*B\*x - (b^3\*c^3\*g^2 - 3\*a\*b^2\*c^2\*d\*g^2 + 2\*a^2\*b\*c\*d^2\*g^2)\*B - 2\*((b^3\*c^2\*d\*g^2 - 2\*a\*b^2\*c\*d^2\*g^2 + a^2\*b\*d^3\*g^2)\*B\*x + (b^3\*c^3\*g^2 - 2\*a\*b^2\*c^2\*d\*g^2 + a^2\*b\*c\*d^2\*g^2)\*B)\*log(d\*x + c))\*log((b\*x + a)^n) - ((b^3\*c\*d^2\*g^2 - a\*b^2\*d^3\*g^2)\*B\*x^2 + (b^3\*c^2\*d\*g^2 - a\*b^2\*c\*d^2\*g^2)\*B\*x - (b^3\*c^3\*g^2 - 3\*a\*b^2\*c^2\*d\*g^2 + 2\*a^2\*b\*c\*d^2\*g^2)\*B - 2\*((b^3\*c^2\*d\*g^2 - 2\*a\*b^2\*c\*d^2\*g^2 + a^2\*b\*d^3\*g^2)\*B\*x + (b^3\*c^3\*g^2 - 2\*a\*b^2\*c^2\*d\*g^2 + a^2\*b\*c\*d^2\*g^2)\*B)\*log(d\*x + c))\*log((d\*x + c)^n))/(b\*c^2\*d^3\*i^2 - a\*c\*d^4\*i^2 + (b\*c\*d^4\*i^2 - a\*d^5\*i^2)\*x) - 2\*(b^2\*c\*g^2\*n - a\*b\*d\*g^2\*n)\*(log(b\*x + a)\*log((b\*d\*x + a\*d)/(b\*c - a\*d) + 1) + dilog(-(b\*d\*x + a\*d)/(b\*c - a\*d)))\*B/(d^3\*i^2)

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{Ab^2g^2x^2 + 2Aabg^2x + Aa^2g^2 + (Bb^2g^2x^2 + 2Babg^2x + Ba^2g^2) \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right)}{d^2i^2x^2 + 2cdi^2x + c^2i^2}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)^2,x, algorithm="fricas")

[Out] integral((A\*b^2\*g^2\*x^2 + 2\*A\*a\*b\*g^2\*x + A\*a^2\*g^2 + (B\*b^2\*g^2\*x^2 + 2\*B\*a\*b\*g^2\*x + B\*a^2\*g^2)\*log(e\*((b\*x + a)/(d\*x + c))^n))/(d^2\*i^2\*x^2 + 2\*c\*d\*i^2\*x + c^2\*i^2), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*\*2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n))/(d\*i\*x+c\*i)\*\*2,x)

[Out] Timed out

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^2 \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)}{(dix + ci)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^2,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)/(d*i*x + c*i)^2, x)
```

$$3.145 \quad \int \frac{(ag+bgx) \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ci+dix)^2} dx$$

**Optimal.** Leaf size=168

$$\frac{bBgnPolyLog \left( 2, \frac{d(a+bx)}{b(c+dx)} \right)}{d^2i^2} - \frac{bg \log \left( \frac{bc-ad}{b(c+dx)} \right) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{d^2i^2} - \frac{Ag(a+bx)}{di^2(c+dx)} - \frac{Bg(a+bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{di^2(c+dx)} + \frac{Bgn}{di^2}$$

[Out]  $-\left(\frac{A*g*(a+b*x)}{(d*i^2*(c+d*x))} + \frac{(B*g*n*(a+b*x))}{(d*i^2*(c+d*x))} - \frac{(B*g*(a+b*x)*Log[e*((a+b*x)/(c+d*x))^n])}{(d*i^2*(c+d*x))} - \frac{(b*g*(A+B*Log[e*((a+b*x)/(c+d*x))^n])*Log[(b*c-a*d)/(b*(c+d*x)])}{(d^2*i^2)} - \frac{(b*B*g*n*PolyLog[2, (d*(a+b*x))/(b*(c+d*x)])}{(d^2*i^2)}\right)$

**Rubi [A]** time = 0.38688, antiderivative size = 234, normalized size of antiderivative = 1.39, number of steps used = 14, number of rules used = 11, integrand size = 41,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.268$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{bBgnPolyLog \left( 2, \frac{b(c+dx)}{bc-ad} \right)}{d^2i^2} + \frac{bg \log(c+dx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{d^2i^2} + \frac{g(bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{d^2i^2(c+dx)} - \frac{Bgn(bc-a*d)}{d^2i^2(c+dx)}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[\left(\frac{(a*g + b*g*x)*(A + B*Log[e*((a+b*x)/(c+d*x))^n])}{(c*i + d*i*x)^2}, x\right)$

[Out]  $-\left(\frac{(B*(b*c - a*d)*g*n)}{(d^2*i^2*(c+d*x))} - \frac{(b*B*g*n*Log[a+b*x])}{(d^2*i^2)} + \frac{((b*c - a*d)*g*(A + B*Log[e*((a+b*x)/(c+d*x))^n])}{(d^2*i^2*(c+d*x))} + \frac{(b*B*g*n*Log[c+d*x])}{(d^2*i^2)} - \frac{(b*B*g*n*Log[-((d*(a+b*x))/(b*c - a*d)])*Log[c+d*x])}{(d^2*i^2)} + \frac{(b*g*(A + B*Log[e*((a+b*x)/(c+d*x))^n])*Log[c+d*x])}{(d^2*i^2)} + \frac{(b*B*g*n*Log[c+d*x]^2)}{(2*d^2*i^2)} - \frac{(b*B*g*n*PolyLog[2, (b*(c+d*x))/(b*c - a*d)])}{(d^2*i^2)}\right)$

**Rule 2528**

$\text{Int}[\left(\frac{(a_. + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_)}{x\_Symbol}\right) :> \text{With}[\{u = \text{ExpandIntegrand}[(a + b*Log[c*RFx^p])^n, RGx, x]\}, \text{Int}[u, x] /; \text{SumQ}[u]] /; \text{FreeQ}[\{a, b, c, p\}, x] \&\& \text{RationalFunctionQ}[RFx, x] \&\& \text{RationalFunctionQ}[RGx, x] \&\& \text{IGtQ}[n, 0]$

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFX^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFX_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFX, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFX, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
```

```
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]*(b_.))^(p_.)*((f_) + (g_.)*(x_)^(q_.)), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rubi steps



$$\begin{aligned}
\int \frac{(ag + bgx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(145c + 145dx)^2} dx &= \int \left( \frac{(-bc + ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{21025d(c + dx)^2} + \frac{bg \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{21025d(c + dx)} \right) dx \\
&= \frac{(bg) \int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{c+dx} dx}{21025d} - \frac{((bc - ad)g) \int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{(c+dx)^2} dx}{21025d} \\
&= \frac{(bc - ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{21025d^2(c + dx)} + \frac{bg \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) \log(c + dx)}{21025d^2} \\
&= \frac{(bc - ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{21025d^2(c + dx)} + \frac{bg \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) \log(c + dx)}{21025d^2} \\
&= \frac{(bc - ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{21025d^2(c + dx)} + \frac{bg \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) \log(c + dx)}{21025d^2} \\
&= -\frac{B(bc - ad)gn}{21025d^2(c + dx)} - \frac{bBgn \log(a + bx)}{21025d^2} + \frac{(bc - ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{21025d^2(c + dx)} \\
&= -\frac{B(bc - ad)gn}{21025d^2(c + dx)} - \frac{bBgn \log(a + bx)}{21025d^2} + \frac{(bc - ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{21025d^2(c + dx)} \\
&= -\frac{B(bc - ad)gn}{21025d^2(c + dx)} - \frac{bBgn \log(a + bx)}{21025d^2} + \frac{(bc - ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{21025d^2(c + dx)}
\end{aligned}$$

**Mathematica [A]** time = 0.178794, size = 183, normalized size = 1.09

$$g \left( -bBn \left( 2 \operatorname{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right) + \log(c + dx) \left( 2 \log \left( \frac{d(a+bx)}{ad-bc} \right) - \log(c + dx) \right) \right) + 2b \log(c + dx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right) \right)$$


---


$$2d^2i^2$$

Antiderivative was successfully verified.

[In] Integrate[((a\*g + b\*g\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(c\*i + d\*i\*x)^2,x]

[Out] (g\*((2\*(b\*c - a\*d)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(c + d\*x) + 2\*b\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[c + d\*x] - 2\*B\*n\*((b\*c - a\*d)/(c

+ d\*x) + b\*Log[a + b\*x] - b\*Log[c + d\*x]) - b\*B\*n\*((2\*Log[(d\*(a + b\*x))/(-  
(b\*c) + a\*d)] - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*  
c - a\*d)])))/(2\*d^2\*i^2)

**Maple [F]** time = 0.514, size = 0, normalized size = 0.

$$\int \frac{bgx + ag}{(dix + ci)^2} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)^2,x)

[Out] int((b\*g\*x+a\*g)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)^2,x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$Bagn \left( \frac{1}{d^2 i^2 x + c d i^2} + \frac{b \log(bx + a)}{(bcd - ad^2) i^2} - \frac{b \log(dx + c)}{(bcd - ad^2) i^2} \right) - \frac{1}{2} Bbg \left( \frac{2(dnx + cn) \log(bx + a) \log(dx + c) - (dnx + cn) \log(dx + c)}{\dots} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)^2,x, alg  
orithm="maxima")

[Out] B\*a\*g\*n\*(1/(d^2\*i^2\*x + c\*d\*i^2) + b\*log(b\*x + a)/((b\*c\*d - a\*d^2)\*i^2) - b  
\*log(d\*x + c)/((b\*c\*d - a\*d^2)\*i^2)) - 1/2\*B\*b\*g\*((2\*(d\*n\*x + c\*n)\*log(b\*x  
+ a)\*log(d\*x + c) - (d\*n\*x + c\*n)\*log(d\*x + c)^2 - 2\*((d\*x + c)\*log(d\*x + c  
) + c)\*log((b\*x + a)^n) + 2\*((d\*x + c)\*log(d\*x + c) + c)\*log((d\*x + c)^n))/  
(d^3\*i^2\*x + c\*d^2\*i^2) - 2\*integrate((b\*d^2\*x^2\*log(e) + a\*d^2\*x\*log(e) -  
b\*c^2\*n + a\*c\*d\*n + (b\*d^2\*n\*x^2 + a\*c\*d\*n + (b\*c\*d\*n + a\*d^2\*n)\*x)\*log(b\*x  
+ a))/(b\*d^4\*i^2\*x^3 + a\*c^2\*d^2\*i^2 + (2\*b\*c\*d^3\*i^2 + a\*d^4\*i^2)\*x^2 + (  
b\*c^2\*d^2\*i^2 + 2\*a\*c\*d^3\*i^2)\*x), x) + A\*b\*g\*(c/(d^3\*i^2\*x + c\*d^2\*i^2) +  
log(d\*x + c)/(d^2\*i^2)) - B\*a\*g\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n)/(d^2  
\*i^2\*x + c\*d\*i^2) - A\*a\*g/(d^2\*i^2\*x + c\*d\*i^2)

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{Abgx + Aag + (Bbgx + Bag) \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right)}{d^2i^2x^2 + 2cdi^2x + c^2i^2}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)^2,x, algorithm="fricas")

[Out] integral((A\*b\*g\*x + A\*a\*g + (B\*b\*g\*x + B\*a\*g)\*log(e\*((b\*x + a)/(d\*x + c))^n))/(d^2\*i^2\*x^2 + 2\*c\*d\*i^2\*x + c^2\*i^2), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)\*\*2,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag) \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)}{(dix + ci)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)^2,x, algorithm="giac")

[Out] integrate((b\*g\*x + a\*g)\*(B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)/(d\*i\*x + c\*i)^2, x)

$$3.146 \quad \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ci+dx)^2} dx$$

**Optimal.** Leaf size=102

$$\frac{A(a+bx)}{i^2(c+dx)(bc-ad)} + \frac{B(a+bx) \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{i^2(c+dx)(bc-ad)} - \frac{Bn(a+bx)}{i^2(c+dx)(bc-ad)}$$

[Out] (A\*(a + b\*x))/((b\*c - a\*d)\*i^2\*(c + d\*x)) - (B\*n\*(a + b\*x))/((b\*c - a\*d)\*i^2\*(c + d\*x)) + (B\*(a + b\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n])/((b\*c - a\*d)\*i^2\*(c + d\*x))

**Rubi [A]** time = 0.078694, antiderivative size = 107, normalized size of antiderivative = 1.05, number of steps used = 4, number of rules used = 3, integrand size = 33,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$ , Rules used = {2525, 12, 44}

$$-\frac{B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A}{d^2(c+dx)} + \frac{bBn \log(a+bx)}{d^2(bc-ad)} - \frac{bBn \log(c+dx)}{d^2(bc-ad)} + \frac{Bn}{d^2(c+dx)}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])/(c\*i + d\*i\*x)^2,x]

[Out] (B\*n)/(d\*i^2\*(c + d\*x)) + (b\*B\*n\*Log[a + b\*x])/(d\*(b\*c - a\*d)\*i^2) - (A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])/(d\*i^2\*(c + d\*x)) - (b\*B\*n\*Log[c + d\*x])/(d\*(b\*c - a\*d)\*i^2)

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

Int[(a\_)\*(u\_), x\_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b\_)\*(v\_) /; FreeQ[b, x]]

#### Rule 44

Int[((a\_) + (b\_)\*(x\_))^(m\_)\*((c\_) + (d\_)\*(x\_))^(n\_), x\_Symbol] := Int[ExpandIntegrand[(a + b\*x)^m\*(c + d\*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b\*c - a\*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])

#### Rubi steps

$$\begin{aligned}
 \int \frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(146c + 146dx)^2} dx &= -\frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{21316d(c + dx)} + \frac{(Bn) \int \frac{bc-ad}{146(a+bx)(c+dx)^2} dx}{146d} \\
 &= -\frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{21316d(c + dx)} + \frac{(B(bc - ad)n) \int \frac{1}{(a+bx)(c+dx)^2} dx}{21316d} \\
 &= -\frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{21316d(c + dx)} + \frac{(B(bc - ad)n) \int \left(\frac{b^2}{(bc-ad)^2(a+bx)} - \frac{d}{(bc-ad)(c+dx)^2} - \frac{bd}{(bc-ad)^2(c+dx)}\right) dx}{21316d} \\
 &= \frac{Bn}{21316d(c + dx)} + \frac{bBn \log(a + bx)}{21316d(bc - ad)} - \frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{21316d(c + dx)} - \frac{bBn \log(c + dx)}{21316d(bc - ad)}
 \end{aligned}$$

**Mathematica [A]** time = 0.0528881, size = 114, normalized size = 1.12

$$\frac{Bn(bc - ad) \left( \frac{1}{(c+dx)(bc-ad)} + \frac{b \log(a+bx)}{(bc-ad)^2} - \frac{b \log(c+dx)}{(bc-ad)^2} \right)}{di^2} - \frac{B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A}{di(ci + dix)}$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])/(c\*i + d\*i\*x)^2,x]

[Out] -((A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])/(d\*i\*(c\*i + d\*i\*x))) + (B\*(b\*c - a\*d)\*n\*(1/((b\*c - a\*d)\*(c + d\*x)) + (b\*Log[a + b\*x])/(b\*c - a\*d)^2 - (b\*Log[c + d\*x])/(b\*c - a\*d)^2))/(d\*i^2)

**Maple [F]** time = 0.518, size = 0, normalized size = 0.

$$\int \frac{1}{(dix + ci)^2} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)^2,x)

[Out] int((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)^2,x)

**Maxima [A]** time = 1.16073, size = 184, normalized size = 1.8

$$Bn \left( \frac{1}{d^2 i^2 x + c d i^2} + \frac{b \log(bx + a)}{(bcd - ad^2) i^2} - \frac{b \log(dx + c)}{(bcd - ad^2) i^2} \right) - \frac{B \log \left( e \left( \frac{bx}{dx+c} + \frac{a}{dx+c} \right)^n \right)}{d^2 i^2 x + c d i^2} - \frac{A}{d^2 i^2 x + c d i^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)^2,x, algorithm="maxima")

[Out] B\*n\*(1/(d^2\*i^2\*x + c\*d\*i^2) + b\*log(b\*x + a)/((b\*c\*d - a\*d^2)\*i^2) - b\*log(d\*x + c)/((b\*c\*d - a\*d^2)\*i^2)) - B\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n)/(d^2\*i^2\*x + c\*d\*i^2) - A/(d^2\*i^2\*x + c\*d\*i^2)

**Fricas [A]** time = 0.507928, size = 221, normalized size = 2.17

$$\frac{A b c - A a d - (B b c - B a d) n + (B b c - B a d) \log(e) - (B b d n x + B a d n) \log\left(\frac{b x + a}{d x + c}\right)}{(b c d^2 - a d^3) i^2 x + (b c^2 d - a c d^2) i^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)^2,x, algorithm="fricas")

[Out] -(A\*b\*c - A\*a\*d - (B\*b\*c - B\*a\*d)\*n + (B\*b\*c - B\*a\*d)\*log(e) - (B\*b\*d\*n\*x + B\*a\*d\*n)\*log((b\*x + a)/(d\*x + c)))/((b\*c\*d^2 - a\*d^3)\*i^2\*x + (b\*c^2\*d - a

`*c*d^2)*i^2)`

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n)))/(d*i*x+c*i)**2,x)`

[Out] Timed out

**Giac [A]** time = 1.79707, size = 134, normalized size = 1.31

$$-\frac{Bbn \log(bx + a)}{bcd - ad^2} + \frac{Bbn \log(dx + c)}{bcd - ad^2} + \frac{Bn \log\left(\frac{bx+a}{dx+c}\right)}{d^2x + cd} - \frac{Bn - A - B}{d^2x + cd}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((A+B*log(e*((b*x+a)/(d*x+c))^n)))/(d*i*x+c*i)^2,x, algorithm="giac")`

[Out] `-B*b*n*log(b*x + a)/(b*c*d - a*d^2) + B*b*n*log(d*x + c)/(b*c*d - a*d^2) + B*n*log((b*x + a)/(d*x + c))/(d^2*x + c*d) - (B*n - A - B)/(d^2*x + c*d)`

$$3.147 \quad \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)(ci+dix)^2} dx$$

**Optimal.** Leaf size=166

$$\frac{b\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)^2}{2Bgi^2n(bc-ad)^2} - \frac{Ad(a+bx)}{gi^2(c+dx)(bc-ad)^2} - \frac{Bd(a+bx) \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{gi^2(c+dx)(bc-ad)^2} + \frac{Bdn(a+bx)}{gi^2(c+dx)(bc-ad)^2}$$

[Out]  $-\left(\frac{A*d*(a+b*x)}{(b*c-a*d)^2*g*i^2*(c+d*x)}\right) + \frac{B*d*n*(a+b*x)}{(b*c-a*d)^2*g*i^2*(c+d*x)} - \frac{B*d*(a+b*x)*\text{Log}\left[e*\left(\frac{a+b*x}{c+d*x}\right)^n\right]}{(b*c-a*d)^2*g*i^2*(c+d*x)} + \frac{b*(A+B*\text{Log}\left[e*\left(\frac{a+b*x}{c+d*x}\right)^n\right])^2}{(2*B*(b*c-a*d)^2*g*i^2*n)}$

**Rubi [C]** time = 0.678837, antiderivative size = 450, normalized size of antiderivative = 2.71, number of steps used = 22, number of rules used = 11, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.256$ , Rules used = {2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 12, 44}

$$\frac{bBn\text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{gi^2(bc-ad)^2} + \frac{bBn\text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{gi^2(bc-ad)^2} + \frac{b \log(a+bx) \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{gi^2(bc-ad)^2} + \frac{B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A}{gi^2(c+dx)(bc-ad)}$$

Antiderivative was successfully verified.

[In]  $\text{Int}\left[\frac{A+B*\text{Log}\left[e*\left(\frac{a+b*x}{c+d*x}\right)^n\right]}{(a*g+b*g*x)*(c*i+d*i*x)^2}, x\right]$

[Out]  $-\left(\frac{B*n}{(b*c-a*d)*g*i^2*(c+d*x)}\right) - \frac{b*B*n*\text{Log}[a+b*x]}{(b*c-a*d)^2*g*i^2} - \frac{b*B*n*\text{Log}[a+b*x]^2}{(2*(b*c-a*d)^2*g*i^2)} + \frac{A+B*\text{Log}\left[e*\left(\frac{a+b*x}{c+d*x}\right)^n\right]}{(b*c-a*d)*g*i^2*(c+d*x)} + \frac{b*\text{Log}[a+b*x]*(A+B*\text{Log}\left[e*\left(\frac{a+b*x}{c+d*x}\right)^n\right])}{(b*c-a*d)^2*g*i^2} + \frac{b*B*n*\text{Log}[c+d*x]}{(b*c-a*d)^2*g*i^2} + \frac{b*B*n*\text{Log}\left[-\left(\frac{d*(a+b*x)}{b*c-a*d}\right)\right]*\text{Log}[c+d*x]}{(b*c-a*d)^2*g*i^2} - \frac{b*(A+B*\text{Log}\left[e*\left(\frac{a+b*x}{c+d*x}\right)^n\right])*\text{Log}[c+d*x]}{(b*c-a*d)^2*g*i^2} - \frac{b*B*n*\text{Log}[c+d*x]^2}{(2*(b*c-a*d)^2*g*i^2)} + \frac{b*B*n*\text{Log}[a+b*x]*\text{Log}\left[\frac{b*(c+d*x)}{b*c-a*d}\right]}{(b*c-a*d)^2*g*i^2} + \frac{b*B*n*\text{PolyLog}\left[2, -\left(\frac{d*(a+b*x)}{b*c-a*d}\right)\right]}{(b*c-a*d)^2*g*i^2} + \frac{b*B*n*\text{PolyLog}\left[2, \frac{b*(c+d*x)}{b*c-a*d}\right]}{(b*c-a*d)^2*g*i^2}$

**Rule 2528**



```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]
] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

#### Rule 2524

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

#### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(Rfx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n]^p, Rfx, x]}, Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[Rfx, x] && IntegerQ[p]
```

#### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

#### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

#### Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

#### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))])*(b_.)/((f_.) + (g_.)*(x_)), x_Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(147c + 147dx)^2(ag + bgx)} dx &= \int \left( \frac{b^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21609(bc - ad)^2g(a + bx)} - \frac{d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21609(bc - ad)g(c + dx)^2} - \frac{bd \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21609(bc - ad)^2g(c + dx)} \right) dx \\
&= \frac{b^2 \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx} dx}{21609(bc - ad)^2g} - \frac{(bd) \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx} dx}{21609(bc - ad)^2g} - \frac{d \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(c+dx)^2} dx}{21609(bc - ad)g} \\
&= \frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{21609(bc - ad)g(c + dx)} + \frac{b \log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21609(bc - ad)^2g} - \frac{b \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21609(bc - ad)g} \\
&= \frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{21609(bc - ad)g(c + dx)} + \frac{b \log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21609(bc - ad)^2g} - \frac{b \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21609(bc - ad)g} \\
&= \frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{21609(bc - ad)g(c + dx)} + \frac{b \log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21609(bc - ad)^2g} - \frac{b \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21609(bc - ad)g} \\
&= -\frac{Bn}{21609(bc - ad)g(c + dx)} - \frac{bBn \log(a + bx)}{21609(bc - ad)^2g} + \frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{21609(bc - ad)g(c + dx)} + \frac{b \log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21609(bc - ad)^2g} \\
&= -\frac{Bn}{21609(bc - ad)g(c + dx)} - \frac{bBn \log(a + bx)}{21609(bc - ad)^2g} - \frac{bBn \log^2(a + bx)}{43218(bc - ad)^2g} + \frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{21609(bc - ad)g(c + dx)} + \frac{b \log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21609(bc - ad)^2g} \\
&= -\frac{Bn}{21609(bc - ad)g(c + dx)} - \frac{bBn \log(a + bx)}{21609(bc - ad)^2g} - \frac{bBn \log^2(a + bx)}{43218(bc - ad)^2g} + \frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{21609(bc - ad)g(c + dx)} + \frac{b \log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21609(bc - ad)^2g}
\end{aligned}$$

**Mathematica [C]** time = 0.313787, size = 304, normalized size = 1.83

$$-bBn(c + dx) \left( \log(a + bx) \left( \log(a + bx) - 2 \log\left(\frac{b(c+dx)}{bc-ad}\right) \right) - 2 \text{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) \right) + bBn(c + dx) \left( 2 \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right) \right)$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])/((a\*g + b\*g\*x)\*(c\*i + d\*i\*x)^2), x]

[Out] (2\*(b\*c - a\*d)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 2\*b\*(c + d\*x)\*Log[a + b\*x]\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 2\*b\*(c + d\*x)\*(A + B\*Log[e

$$*((a + b*x)/(c + d*x))^n]*\text{Log}[c + d*x] - 2*B*n*(b*c - a*d + b*(c + d*x)*\text{Log}[a + b*x] - b*(c + d*x)*\text{Log}[c + d*x]) - b*B*n*(c + d*x)*(\text{Log}[a + b*x]*(\text{Log}[a + b*x] - 2*\text{Log}[(b*(c + d*x))/(b*c - a*d)]) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-b*c + a*d)]) + b*B*n*(c + d*x)*((2*\text{Log}[(d*(a + b*x))/(-b*c + a*d)] - \text{Log}[c + d*x])* \text{Log}[c + d*x] + 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])))/(2*(b*c - a*d)^2*g*i^2*(c + d*x))$$

**Maple [F]** time = 0.762, size = 0, normalized size = 0.

$$\int \frac{1}{(bgx + ag)(dix + ci)^2} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)/(d\*i\*x+c\*i)^2,x)

[Out] int((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)/(d\*i\*x+c\*i)^2,x)

**Maxima [B]** time = 1.29679, size = 572, normalized size = 3.45

$$B \left( \frac{1}{(bcd - ad^2)gi^2x + (bc^2 - acd)gi^2} + \frac{b \log(bx + a)}{(b^2c^2 - 2abcd + a^2d^2)gi^2} - \frac{b \log(dx + c)}{(b^2c^2 - 2abcd + a^2d^2)gi^2} \right) \log \left( e \left( \frac{bx}{dx + c} + \frac{a}{dx + c} \right)^n \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)/(d\*i\*x+c\*i)^2,x, algorithm="maxima")

[Out] B\*(1/((b\*c\*d - a\*d^2)\*g\*i^2\*x + (b\*c^2 - a\*c\*d)\*g\*i^2) + b\*log(b\*x + a)/((b^2\*c^2 - 2\*a\*b\*c\*d + a^2\*d^2)\*g\*i^2) - b\*log(d\*x + c)/((b^2\*c^2 - 2\*a\*b\*c\*d + a^2\*d^2)\*g\*i^2))\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n) - 1/2\*((b\*d\*x + b\*c)\*log(b\*x + a)^2 + (b\*d\*x + b\*c)\*log(d\*x + c)^2 + 2\*b\*c - 2\*a\*d + 2\*(b\*d\*x + b\*c)\*log(b\*x + a) - 2\*(b\*d\*x + b\*c + (b\*d\*x + b\*c)\*log(b\*x + a))\*log(d\*x + c))\*B\*n/(b^2\*c^3\*g\*i^2 - 2\*a\*b\*c^2\*d\*g\*i^2 + a^2\*c\*d^2\*g\*i^2 + (b^2\*c^2\*d\*g\*i^2 - 2\*a\*b\*c\*d^2\*g\*i^2 + a^2\*d^3\*g\*i^2)\*x) + A\*(1/((b\*c\*d - a\*d^2)\*g\*i^2\*x + (b\*c^2 - a\*c\*d)\*g\*i^2) + b\*log(b\*x + a)/((b^2\*c^2 - 2\*a\*b\*c\*d + a^2\*d^2)\*g\*i^2) - b\*log(d\*x + c)/((b^2\*c^2 - 2\*a\*b\*c\*d + a^2\*d^2)\*g\*i^2))

---

**Fricas [A]** time = 0.52912, size = 444, normalized size = 2.67

$$\frac{2Abc - 2Aad + (Bbdnx + Bbcn) \log\left(\frac{bx+a}{dx+c}\right)^2 - 2(Bbc - Bad)n + 2\left(Bbc - Bad + (Bbdx + Bbc) \log\left(\frac{bx+a}{dx+c}\right)\right) \log(e) - 2(Bbdx + Bbc) \log\left(\frac{bx+a}{dx+c}\right)}{2\left((b^2c^2d - 2abcd^2 + a^2d^3)gi^2x + (b^2c^3 - 2abc^2d + a^2cd^2)gi^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)/(d\*i\*x+c\*i)^2,x, algorithm="fricas")

[Out] 1/2\*(2\*A\*b\*c - 2\*A\*a\*d + (B\*b\*d\*n\*x + B\*b\*c\*n)\*log((b\*x + a)/(d\*x + c))^2 - 2\*(B\*b\*c - B\*a\*d)\*n + 2\*(B\*b\*c - B\*a\*d + (B\*b\*d\*x + B\*b\*c)\*log((b\*x + a)/(d\*x + c)))\*log(e) - 2\*(B\*a\*d\*n - A\*b\*c + (B\*b\*d\*n - A\*b\*d)\*x)\*log((b\*x + a)/(d\*x + c)))/((b^2\*c^2\*d - 2\*a\*b\*c\*d^2 + a^2\*d^3)\*g\*i^2\*x + (b^2\*c^3 - 2\*a\*b\*c^2\*d + a^2\*c\*d^2)\*g\*i^2)

---

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)/(d\*i\*x+c\*i)\*\*2,x)

[Out] Timed out

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{B \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A}{(bgx + ag)(dix + ci)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)/(d\*i\*x+c\*i)^2,x, algorithm="giac")

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)/((b*g*x + a*g)*(d*i*x + c*i)^2), x)
```

$$3.148 \quad \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^2(ci+dix)^2} dx$$

**Optimal.** Leaf size=273

$$\frac{b^2(c+dx)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i^2(a+bx)(bc-ad)^3} + \frac{d^2(a+bx)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i^2(c+dx)(bc-ad)^3} - \frac{2bd \log\left(\frac{a+bx}{c+dx}\right)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i^2(bc-ad)^3}$$

[Out]  $-\left(\frac{B*d^2*n*(a+b*x)}{(b*c-a*d)^3*g^2*i^2*(c+d*x)}\right) - \left(\frac{b^2*B*n*(c+d*x)}{(b*c-a*d)^3*g^2*i^2*(a+b*x)}\right) + \left(\frac{d^2*(a+b*x)*(A+B*Log[e*((a+b*x)/(c+d*x))^n])}{(b*c-a*d)^3*g^2*i^2*(c+d*x)}\right) - \left(\frac{b^2*(c+d*x)*(A+B*Log[e*((a+b*x)/(c+d*x))^n])}{(b*c-a*d)^3*g^2*i^2*(a+b*x)}\right) - \left(\frac{2*b*d*(A+B*Log[e*((a+b*x)/(c+d*x))^n])*Log[(a+b*x)/(c+d*x)]}{(b*c-a*d)^3*g^2*i^2}\right) + \left(\frac{b*B*d*n*Log[(a+b*x)/(c+d*x)]^2}{(b*c-a*d)^3*g^2*i^2}\right)$

**Rubi [C]** time = 0.829938, antiderivative size = 482, normalized size of antiderivative = 1.77, number of steps used = 26, number of rules used = 11, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.256$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{2bBdnPolyLog\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{g^2i^2(bc-ad)^3} - \frac{2bBdnPolyLog\left(2, \frac{b(c+dx)}{bc-ad}\right)}{g^2i^2(bc-ad)^3} - \frac{2bd \log(a+bx)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i^2(bc-ad)^3} - \frac{b\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i^2(a+bx)}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])/((a\*g + b\*g\*x)^2\*(c\*i + d\*i\*x)^2), x]

[Out]  $-\left(\frac{b*B*n}{(b*c-a*d)^2*g^2*i^2*(a+b*x)}\right) + \left(\frac{B*d*n}{(b*c-a*d)^2*g^2*i^2*(c+d*x)}\right) + \left(\frac{b*B*d*n*Log[a+b*x]^2}{(b*c-a*d)^3*g^2*i^2}\right) - \left(\frac{b*(A+B*Log[e*((a+b*x)/(c+d*x))^n])}{(b*c-a*d)^2*g^2*i^2*(a+b*x)}\right) - \left(\frac{d*(A+B*Log[e*((a+b*x)/(c+d*x))^n])}{(b*c-a*d)^2*g^2*i^2*(c+d*x)}\right) - \left(\frac{2*b*d*Log[a+b*x]*(A+B*Log[e*((a+b*x)/(c+d*x))^n])}{(b*c-a*d)^3*g^2*i^2}\right) - \left(\frac{2*b*B*d*n*Log[-((d*(a+b*x))/(b*c-a*d))]*Log[c+d*x]}{(b*c-a*d)^3*g^2*i^2}\right) + \left(\frac{2*b*d*(A+B*Log[e*((a+b*x)/(c+d*x))^n])*Log[c+d*x]}{(b*c-a*d)^3*g^2*i^2}\right) + \left(\frac{b*B*d*n*Log[c+d*x]^2}{(b*c-a*d)^3*g^2*i^2}\right) - \left(\frac{2*b*B*d*n*Log[a+b*x]*Log[(b*(c+d*x))/(b*c-a*d)]}{(b*c-a*d)^3*g^2*i^2}\right) - \left(\frac{2*b*B*d*n*PolyLog[2, -((d*(a+b*x))/(b*c-a*d))]}{(b*c-a*d)^3*g^2*i^2}\right) - \left(\frac{2*b*B*d*n*PolyLog[2, (b*(c+d*x))/(b*c-a*d)]}{(b*c-a*d)^3*g^2*i^2}\right)$

- a\*d)^3\*g^2\*i^2)

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(Rfx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, Rfx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
Rfx, x] && IntegerQ[p]
```



Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}
\int \frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(148c + 148dx)^2(ag + bgx)^2} dx &= \int \left( \frac{b^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21904(bc - ad)^2g^2(a + bx)^2} - \frac{b^2d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{10952(bc - ad)^3g^2(a + bx)} + \frac{d^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21904(bc - ad)^2g^2} \right) dx \\
&= -\frac{(b^2d) \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx} dx}{10952(bc - ad)^3g^2} + \frac{(bd^2) \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx} dx}{10952(bc - ad)^3g^2} + \frac{b^2 \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^2} dx}{21904(bc - ad)^2g^2} \\
&= -\frac{b \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21904(bc - ad)^2g^2(a + bx)} - \frac{d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21904(bc - ad)^2g^2(c + dx)} - \frac{bd \log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{10952(bc - ad)^2g^2} \\
&= -\frac{b \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21904(bc - ad)^2g^2(a + bx)} - \frac{d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21904(bc - ad)^2g^2(c + dx)} - \frac{bd \log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{10952(bc - ad)^2g^2} \\
&= -\frac{b \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21904(bc - ad)^2g^2(a + bx)} - \frac{d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21904(bc - ad)^2g^2(c + dx)} - \frac{bd \log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{10952(bc - ad)^2g^2} \\
&= -\frac{bBn}{21904(bc - ad)^2g^2(a + bx)} + \frac{Bdn}{21904(bc - ad)^2g^2(c + dx)} - \frac{b \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{21904(bc - ad)^2g^2(a + bx)} \\
&= -\frac{bBn}{21904(bc - ad)^2g^2(a + bx)} + \frac{Bdn}{21904(bc - ad)^2g^2(c + dx)} + \frac{bBdn \log^2(a + bx)}{21904(bc - ad)^3g^2} - \frac{b}{21904(bc - ad)^3g^2} \\
&= -\frac{bBn}{21904(bc - ad)^2g^2(a + bx)} + \frac{Bdn}{21904(bc - ad)^2g^2(c + dx)} + \frac{bBdn \log^2(a + bx)}{21904(bc - ad)^3g^2} - \frac{b}{21904(bc - ad)^3g^2}
\end{aligned}$$

**Mathematica [C]** time = 0.476942, size = 342, normalized size = 1.25

$$bBdn \left( \log(a + bx) \left( \log(a + bx) - 2 \log\left(\frac{b(c+dx)}{bc-ad}\right) \right) - 2 \text{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) \right) - bBdn \left( 2 \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right) + \log(c + dx) \right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^2*(c*i + d*i*x)^2), x]
```

```
[Out] (-((b^2*B*c*n)/(a + b*x)) + (a*b*B*d*n)/(a + b*x) + (b*B*c*d*n)/(c + d*x) -
(a*B*d^2*n)/(c + d*x) - (b*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^
n]))/(a + b*x) + (d*(-(b*c) + a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/
(c + d*x) - 2*b*d*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 2*b
*d*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + b*B*d*n*(Log[a + b
*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d])) - 2*PolyLog[2, (d*(a
+ b*x))/(-(b*c) + a*d)]) - b*B*d*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] -
Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/((b*
c - a*d)^3*g^2*i^2)
```

**Maple [F]** time = 0.746, size = 0, normalized size = 0.

$$\int \frac{1}{(bgx + ag)^2 (dix + ci)^2} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x)
```

**Maxima [B]** time = 1.38429, size = 1164, normalized size = 4.26

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x, a
lgorithm="maxima")
```

```
[Out] -B*((2*b*d*x + b*c + a*d)/((b^3*c^2*d - 2*a*b^2*c*d^2 + a^2*b*d^3)*g^2*i^2*
x^2 + (b^3*c^3 - a*b^2*c^2*d - a^2*b*c*d^2 + a^3*d^3)*g^2*i^2*x + (a*b^2*c^
3 - 2*a^2*b*c^2*d + a^3*c*d^2)*g^2*i^2) + 2*b*d*log(b*x + a)/((b^3*c^3 - 3*
a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2*i^2) - 2*b*d*log(d*x + c)/((b^3*
c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2*i^2))*log(e*(b*x/(d*x +
c) + a/(d*x + c))^n) - (b^2*c^2 - 2*a*b*c*d + a^2*d^2 - (b^2*d^2*x^2 + a*b*
c*d + (b^2*c*d + a*b*d^2)*x)*log(b*x + a)^2 + 2*(b^2*d^2*x^2 + a*b*c*d + (b
^2*c*d + a*b*d^2)*x)*log(b*x + a)*log(d*x + c) - (b^2*d^2*x^2 + a*b*c*d + (
b^2*c*d + a*b*d^2)*x)*log(d*x + c)^2)*B*n/(a*b^3*c^4*g^2*i^2 - 3*a^2*b^2*c^
```

```

3*d*g^2*i^2 + 3*a^3*b*c^2*d^2*g^2*i^2 - a^4*c*d^3*g^2*i^2 + (b^4*c^3*d*g^2*
i^2 - 3*a*b^3*c^2*d^2*g^2*i^2 + 3*a^2*b^2*c*d^3*g^2*i^2 - a^3*b*d^4*g^2*i^2
)*x^2 + (b^4*c^4*g^2*i^2 - 2*a*b^3*c^3*d*g^2*i^2 + 2*a^3*b*c*d^3*g^2*i^2 -
a^4*d^4*g^2*i^2)*x) - A*((2*b*d*x + b*c + a*d)/((b^3*c^2*d - 2*a*b^2*c*d^2
+ a^2*b*d^3)*g^2*i^2*x^2 + (b^3*c^3 - a*b^2*c^2*d - a^2*b*c*d^2 + a^3*d^3)*
g^2*i^2*x + (a*b^2*c^3 - 2*a^2*b*c^2*d + a^3*c*d^2)*g^2*i^2) + 2*b*d*log(b*
x + a)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2*i^2) - 2*b*
d*log(d*x + c)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2*i^2
))

```

**Fricas [A]** time = 0.552019, size = 932, normalized size = 3.41

$$\frac{Ab^2c^2 - Aa^2d^2 + (Bb^2d^2nx^2 + Babcdn + (Bb^2cd + Babd^2)nx) \log\left(\frac{bx+a}{dx+c}\right)^2 + (Bb^2c^2 - 2Babcd + Ba^2d^2)n + 2(Ab^2cd - \dots)}{(b^4c^3d - 3ab^3c^2d^2 + \dots)}$$

Verification of antiderivative is not currently implemented for this CAS.

```

[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x, a
lgorithm="fricas")

```

```

[Out] -(A*b^2*c^2 - A*a^2*d^2 + (B*b^2*d^2*n*x^2 + B*a*b*c*d*n + (B*b^2*c*d + B*a
*b*d^2)*n*x)*log((b*x + a)/(d*x + c))^2 + (B*b^2*c^2 - 2*B*a*b*c*d + B*a^2*
d^2)*n + 2*(A*b^2*c*d - A*a*b*d^2)*x + (B*b^2*c^2 - B*a^2*d^2 + 2*(B*b^2*c*
d - B*a*b*d^2)*x + 2*(B*b^2*d^2*x^2 + B*a*b*c*d + (B*b^2*c*d + B*a*b*d^2)*x
)*log((b*x + a)/(d*x + c)))*log(e) + (2*A*b^2*d^2*x^2 + 2*A*a*b*c*d + (B*b^
2*c^2 - B*a^2*d^2)*n + 2*(A*b^2*c*d + A*a*b*d^2 + (B*b^2*c*d - B*a*b*d^2)*n
)*x)*log((b*x + a)/(d*x + c)))/((b^4*c^3*d - 3*a*b^3*c^2*d^2 + 3*a^2*b^2*c*
d^3 - a^3*b*d^4)*g^2*i^2*x^2 + (b^4*c^4 - 2*a*b^3*c^3*d + 2*a^3*b*c*d^3 - a
^4*d^4)*g^2*i^2*x + (a*b^3*c^4 - 3*a^2*b^2*c^3*d + 3*a^3*b*c^2*d^2 - a^4*c*
d^3)*g^2*i^2)

```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```

[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)**2/(d*i*x+c*i)**2,x)

```

[Out] Timed out

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{B \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A}{(bgx + ag)^2 (dix + ci)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^2/(d\*i\*x+c\*i)^2,x, algorithm="giac")

[Out] integrate((B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)/((b\*g\*x + a\*g)^2\*(d\*i\*x + c\*i)^2), x)

$$3.149 \quad \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^3(ci+dx)^2} dx$$

**Optimal.** Leaf size=380

$$\frac{b^3(c+dx)^2 \left( B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A \right)}{2g^3i^2(a+bx)^2(bc-ad)^4} + \frac{3b^2d(c+dx) \left( B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A \right)}{g^3i^2(a+bx)(bc-ad)^4} + \frac{3bd^2 \log\left(\frac{a+bx}{c+dx}\right) \left( B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A \right)}{g^3i^2(bc-ad)^4}$$

[Out] (B\*d^3\*n\*(a + b\*x))/((b\*c - a\*d)^4\*g^3\*i^2\*(c + d\*x)) + (3\*b^2\*B\*d\*n\*(c + d\*x))/((b\*c - a\*d)^4\*g^3\*i^2\*(a + b\*x)) - (b^3\*B\*n\*(c + d\*x)^2)/(4\*(b\*c - a\*d)^4\*g^3\*i^2\*(a + b\*x)^2) - (d^3\*(a + b\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/((b\*c - a\*d)^4\*g^3\*i^2\*(c + d\*x)) + (3\*b^2\*d\*(c + d\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/((b\*c - a\*d)^4\*g^3\*i^2\*(a + b\*x)) - (b^3\*(c + d\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(2\*(b\*c - a\*d)^4\*g^3\*i^2\*(a + b\*x)^2) + (3\*b\*d^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[(a + b\*x)/(c + d\*x)])/((b\*c - a\*d)^4\*g^3\*i^2) - (3\*b\*B\*d^2\*n\*Log[(a + b\*x)/(c + d\*x)]^2)/(2\*(b\*c - a\*d)^4\*g^3\*i^2)

**Rubi [C]** time = 1.08723, antiderivative size = 656, normalized size of antiderivative = 1.73, number of steps used = 30, number of rules used = 11, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.256$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{3bBd^2n \text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{g^3i^2(bc-ad)^4} + \frac{3bBd^2n \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{g^3i^2(bc-ad)^4} + \frac{3bd^2 \log(a+bx) \left( B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A \right)}{g^3i^2(bc-ad)^4} + \frac{d^2 \left( B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A \right)}{g^3i^2(c+dx)}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])/((a\*g + b\*g\*x)^3\*(c\*i + d\*i\*x)^2), x]

[Out] -(b\*B\*n)/(4\*(b\*c - a\*d)^2\*g^3\*i^2\*(a + b\*x)^2) + (5\*b\*B\*d\*n)/(2\*(b\*c - a\*d)^3\*g^3\*i^2\*(a + b\*x)) - (B\*d^2\*n)/((b\*c - a\*d)^3\*g^3\*i^2\*(c + d\*x)) + (3\*b\*B\*d^2\*n\*Log[a + b\*x])/((b\*c - a\*d)^4\*g^3\*i^2) - (3\*b\*B\*d^2\*n\*Log[a + b\*x]^2)/((b\*c - a\*d)^4\*g^3\*i^2) - (b\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(2\*(b\*c - a\*d)^2\*g^3\*i^2\*(a + b\*x)^2) + (2\*b\*d\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/((b\*c - a\*d)^3\*g^3\*i^2\*(a + b\*x)) + (d^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/((b\*c - a\*d)^3\*g^3\*i^2\*(c + d\*x)) + (3\*b\*d^2\*Log[a + b\*x]\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/((b\*c - a\*d)^4\*g^3\*i^2) - (3\*b\*B\*d^2\*n\*Log[c + d\*x])/((b\*c - a\*d)^4\*g^3\*i^2) + (3\*b\*B\*d^2\*n\*Log[-((d\*(a + b

$$\frac{(x)/(b*c - a*d)]*Log[c + d*x]}{((b*c - a*d)^4*g^3*i^2) - (3*b*d^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]*Log[c + d*x]))/((b*c - a*d)^4*g^3*i^2) - (3*b*B*d^2*n*Log[c + d*x]^2)/(2*(b*c - a*d)^4*g^3*i^2) + (3*b*B*d^2*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d]))/((b*c - a*d)^4*g^3*i^2) + (3*b*B*d^2*n*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^4*g^3*i^2) + (3*b*B*d^2*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d))])/((b*c - a*d)^4*g^3*i^2)}$$

### Rule 2528

$$\text{Int}[\{(a_.) + \text{Log}[(c_.)*(RfX_)^{(p_.)}]*(b_.)^{(n_.)}*(RGx_)\}, x\_Symbol] \rightarrow \text{With}[\{u = \text{ExpandIntegrand}[(a + b*\text{Log}[c*RfX^p])^n, RGx, x]\}, \text{Int}[u, x] /; \text{SumQ}[u]] /; \text{FreeQ}[\{a, b, c, p\}, x] \&\& \text{RationalFunctionQ}[RfX, x] \&\& \text{RationalFunctionQ}[RGx, x] \&\& \text{IGtQ}[n, 0]$$

### Rule 2525

$$\text{Int}[\{(a_.) + \text{Log}[(c_.)*(RfX_)^{(p_.)}]*(b_.)^{(n_.)}*((d_.) + (e_.)*(x_.))^{(m_.)}\}, x\_Symbol] \rightarrow \text{Simp}[\{(d + e*x)^{(m + 1)}*(a + b*\text{Log}[c*RfX^p])^n / (e*(m + 1))\}, x] - \text{Dist}[(b*n*p) / (e*(m + 1)), \text{Int}[\text{SimplifyIntegrand}[\{(d + e*x)^{(m + 1)}*(a + b*\text{Log}[c*RfX^p])^{(n - 1)}*D[RfX, x]\} / RfX, x], x] /; \text{FreeQ}[\{a, b, c, d, e, m, p\}, x] \&\& \text{RationalFunctionQ}[RfX, x] \&\& \text{IGtQ}[n, 0] \&\& (\text{EqQ}[n, 1] \|\ \text{IntegerQ}[m]) \&\& \text{NeQ}[m, -1]$$

### Rule 12

$$\text{Int}[(a_)*(u_), x\_Symbol] \rightarrow \text{Dist}[a, \text{Int}[u, x], x] /; \text{FreeQ}[a, x] \&\& \text{!MatchQ}[u, (b_)*(v_)] /; \text{FreeQ}[b, x]$$

### Rule 44

$$\text{Int}[\{(a_) + (b_.)*(x_.))^{(m_.)}*((c_.) + (d_.)*(x_.))^{(n_.)}\}, x\_Symbol] \rightarrow \text{Int}[\text{ExpandIntegrand}[(a + b*x)^m*(c + d*x)^n, x], x] /; \text{FreeQ}[\{a, b, c, d\}, x] \&\& \text{NeQ}[b*c - a*d, 0] \&\& \text{ILtQ}[m, 0] \&\& \text{IntegerQ}[n] \&\& \text{!(IGtQ}[n, 0] \&\& \text{LtQ}[m + n + 2, 0])]$$

### Rule 2524

$$\text{Int}[\{(a_.) + \text{Log}[(c_.)*(RfX_)^{(p_.)}]*(b_.)^{(n_.)} / ((d_.) + (e_.)*(x_.))\}, x\_Symbol] \rightarrow \text{Simp}[(\text{Log}[d + e*x]*(a + b*\text{Log}[c*RfX^p])^n) / e, x] - \text{Dist}[(b*n*p) / e, \text{Int}[(\text{Log}[d + e*x]*(a + b*\text{Log}[c*RfX^p])^{(n - 1)}*D[RfX, x]) / RfX, x], x] /; \text{FreeQ}[\{a, b, c, d, e, p\}, x] \&\& \text{RationalFunctionQ}[RfX, x] \&\& \text{IGtQ}[n, 0]$$

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol]
:= With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)
*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol]
:= Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol]
:= Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rubi steps



$$\begin{aligned}
\int \frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(149c + 149dx)^2(ag + bgx)^3} dx &= \int \left( \frac{b^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{22201(bc - ad)^2 g^3 (a + bx)^3} - \frac{2b^2 d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{22201(bc - ad)^3 g^3 (a + bx)^2} + \frac{3b^2 d^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{22201(bc - ad)^4 g^3 (a + bx)} \right) dx \\
&= \frac{(3b^2 d^2) \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx} dx}{22201(bc - ad)^4 g^3} - \frac{(3bd^3) \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx} dx}{22201(bc - ad)^4 g^3} - \frac{(2b^2 d) \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)} dx}{22201(bc - ad)^4 g^3} \\
&= -\frac{b \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{44402(bc - ad)^2 g^3 (a + bx)^2} + \frac{2bd \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{22201(bc - ad)^3 g^3 (a + bx)} + \frac{d^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{22201(bc - ad)^3 g^3 (a + bx)} \\
&= -\frac{b \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{44402(bc - ad)^2 g^3 (a + bx)^2} + \frac{2bd \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{22201(bc - ad)^3 g^3 (a + bx)} + \frac{d^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{22201(bc - ad)^3 g^3 (a + bx)} \\
&= -\frac{b \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{44402(bc - ad)^2 g^3 (a + bx)^2} + \frac{2bd \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{22201(bc - ad)^3 g^3 (a + bx)} + \frac{d^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{22201(bc - ad)^3 g^3 (a + bx)} \\
&= -\frac{bBn}{88804(bc - ad)^2 g^3 (a + bx)^2} + \frac{5bBdn}{44402(bc - ad)^3 g^3 (a + bx)} - \frac{Bd^2 n}{22201(bc - ad)^3 g^3 (a + bx)} \\
&= -\frac{bBn}{88804(bc - ad)^2 g^3 (a + bx)^2} + \frac{5bBdn}{44402(bc - ad)^3 g^3 (a + bx)} - \frac{Bd^2 n}{22201(bc - ad)^3 g^3 (a + bx)} \\
&= -\frac{bBn}{88804(bc - ad)^2 g^3 (a + bx)^2} + \frac{5bBdn}{44402(bc - ad)^3 g^3 (a + bx)} - \frac{Bd^2 n}{22201(bc - ad)^3 g^3 (a + bx)}
\end{aligned}$$

**Mathematica [C]** time = 0.844032, size = 478, normalized size = 1.26

$$-6bBd^2 n \left( \log(a + bx) \left( \log(a + bx) - 2 \log\left(\frac{b(c+dx)}{bc-ad}\right) \right) - 2 \text{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) \right) + 6bBd^2 n \left( 2 \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right) + \log\left(\frac{b(c+dx)}{bc-ad}\right) \right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^3*(c*i + d*i*x)^2), x]
```

```
[Out] (-((b*B*(b*c - a*d)^2*n)/(a + b*x)^2) + (8*b^2*B*c*d*n)/(a + b*x) - (8*a*b*B*d^2*n)/(a + b*x) + (2*b*B*d*(b*c - a*d)*n)/(a + b*x) - (4*b*B*c*d^2*n)/(c + d*x) + (4*a*B*d^3*n)/(c + d*x) + 6*b*B*d^2*n*Log[a + b*x] - (2*b*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x)^2 + (8*b*d*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x) + (4*d^2*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c + d*x) + 12*b*d^2*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 6*b*B*d^2*n*Log[c + d*x] - 12*b*d^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] - 6*b*B*d^2*n*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d])) - 2*PolyLog[2, (d*(a + b*x))/(-b*c) + a*d]) + 6*b*B*d^2*n*((2*Log[(d*(a + b*x))/(-b*c) + a*d]) - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(4*(b*c - a*d)^4*g^3*i^2)
```

**Maple [F]** time = 0.746, size = 0, normalized size = 0.

$$\int \frac{1}{(bgx + ag)^3 (dix + ci)^2} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x)
```

**Maxima [B]** time = 1.75279, size = 2327, normalized size = 6.12

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x, algorithm="maxima")
```

```
[Out] 1/2*B*((6*b^2*d^2*x^2 - b^2*c^2 + 5*a*b*c*d + 2*a^2*d^2 + 3*(b^2*c*d + 3*a*b*d^2)*x)/((b^5*c^3*d - 3*a*b^4*c^2*d^2 + 3*a^2*b^3*c*d^3 - a^3*b^2*d^4)*g^3*i^2*x^3 + (b^5*c^4 - a*b^4*c^3*d - 3*a^2*b^3*c^2*d^2 + 5*a^3*b^2*c*d^3 - 2*a^4*b*d^4)*g^3*i^2*x^2 + (2*a*b^4*c^4 - 5*a^2*b^3*c^3*d + 3*a^3*b^2*c^2*d^2 + a^4*b*c*d^3 - a^5*d^4)*g^3*i^2*x + (a^2*b^3*c^4 - 3*a^3*b^2*c^3*d + 3*a^4*b*c^2*d^2 - a^5*c*d^3)*g^3*i^2) + 6*b*d^2*log(b*x + a)/((b^4*c^4 - 4*a
```

$$\begin{aligned}
& b^3c^3d + 6a^2b^2c^2d^2 - 4a^3b^2cd^3 + a^4d^4)g^3i^2) - 6bd^2 \\
& * \log(dx + c) / ((b^4c^4 - 4a^2b^3c^3d + 6a^2b^2c^2d^2 - 4a^3b^2cd^3 \\
& + a^4d^4)g^3i^2)) * \log(e*(b*x/(d*x + c) + a/(d*x + c))^n) - 1/4*(b^3c^3 \\
& - 12a^2b^2c^2d + 15a^2b^2cd^2 - 4a^3d^3 - 6*(b^3c^2d^2 - a^2b^2d^3)* \\
& x^2 + 6*(b^3d^3*x^3 + a^2b^2cd^2 + (b^3c^2d^2 + 2a^2b^2d^3)*x^2 + (2a^2b \\
& ^2c^2d^2 + a^2b^2d^3)*x) * \log(b*x + a)^2 + 6*(b^3d^3*x^3 + a^2b^2cd^2 + (b \\
& ^3c^2d^2 + 2a^2b^2d^3)*x^2 + (2a^2b^2cd^2 + a^2b^2d^3)*x) * \log(dx + c)^2 \\
& - 3*(3b^3c^2d - 2a^2b^2cd^2 - a^2b^2d^3)*x - 6*(b^3d^3*x^3 + a^2b^2cd \\
& ^2 + (b^3c^2d^2 + 2a^2b^2d^3)*x^2 + (2a^2b^2cd^2 + a^2b^2d^3)*x) * \log(b \\
& *x + a) + 6*(b^3d^3*x^3 + a^2b^2cd^2 + (b^3c^2d^2 + 2a^2b^2d^3)*x^2 + (2 \\
& *a^2b^2cd^2 + a^2b^2d^3)*x - 2*(b^3d^3*x^3 + a^2b^2cd^2 + (b^3c^2d^2 + 2 \\
& *a^2b^2d^3)*x^2 + (2a^2b^2cd^2 + a^2b^2d^3)*x) * \log(b*x + a)) * \log(dx + c) \\
& ) * B^n / (a^2b^4c^5g^3i^2 - 4a^3b^3c^4d^2g^3i^2 + 6a^4b^2c^3d^2g^3 \\
& i^2 - 4a^5b^2c^2d^3g^3i^2 + a^6c^4d^4g^3i^2 + (b^6c^4d^4g^3i^2 - \\
& 4a^5b^2c^3d^2g^3i^2 + 6a^2b^4c^2d^3g^3i^2 - 4a^3b^3c^2d^4g^3i \\
& ^2 + a^4b^2d^5g^3i^2)*x^3 + (b^6c^5g^3i^2 - 2a^5b^5c^4d^4g^3i^2 - \\
& 2a^2b^4c^3d^2g^3i^2 + 8a^3b^3c^2d^3g^3i^2 - 7a^4b^2c^2d^4g^3 \\
& *i^2 + 2a^5b^2d^5g^3i^2)*x^2 + (2a^5b^5c^5g^3i^2 - 7a^2b^4c^4d^4g^3 \\
& i^2 + 8a^3b^3c^3d^2g^3i^2 - 2a^4b^2c^2d^3g^3i^2 - 2a^5b^2cd \\
& ^4g^3i^2 + a^6d^5g^3i^2)*x) + 1/2*A*((6b^2d^2*x^2 - b^2c^2 + 5a^2b \\
& c^2d + 2a^2d^2 + 3*(b^2c^2d + 3a^2b^2d^2)*x) / ((b^5c^3d - 3a^2b^4c^2d^2 \\
& + 3a^2b^3c^2d^3 - a^3b^2d^4)g^3i^2*x^3 + (b^5c^4 - a^2b^4c^3d - 3a \\
& ^2b^3c^2d^2 + 5a^3b^2c^2d^3 - 2a^4b^2d^4)g^3i^2*x^2 + (2a^2b^4c^4 \\
& - 5a^2b^3c^3d + 3a^3b^2c^2d^2 + a^4b^2cd^3 - a^5d^4)g^3i^2*x + \\
& (a^2b^3c^4 - 3a^3b^2c^3d + 3a^4b^2cd^2 - a^5cd^3)g^3i^2) + 6* \\
& b^2d^2 * \log(b*x + a) / ((b^4c^4 - 4a^2b^3c^3d + 6a^2b^2c^2d^2 - 4a^3b^2 \\
& cd^3 + a^4d^4)g^3i^2) - 6bd^2 * \log(dx + c) / ((b^4c^4 - 4a^2b^3c^3d \\
& + 6a^2b^2c^2d^2 - 4a^3b^2cd^3 + a^4d^4)g^3i^2))
\end{aligned}$$

**Fricas [B]** time = 0.588953, size = 1956, normalized size = 5.15

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^3/(d\*i\*x+c\*i)^2,x, a  
lgorithm="fricas")

[Out]  $-1/4*(2A^2b^3c^3 - 12A^2a^2b^2c^2d + 6A^2a^2b^2cd^2 + 4A^2a^3d^3 - 6*(2$   
 $*A^2b^3c^2d^2 - 2A^2a^2b^2d^3 + (B^2b^3c^2d^2 - B^2a^2b^2d^3)*n)*x^2 - 6*(B^2b^3$   
 $d^3*n*x^3 + B^2a^2b^2cd^2*n + (B^2b^3c^2d^2 + 2B^2a^2b^2d^3)*n*x^2 + (2B^2$   
 $a^2b^2cd^2 + B^2a^2b^2d^3)*n*x) * \log((b*x + a)/(d*x + c))^2 + (B^2b^3c^3 - 1$

```

2*B*a*b^2*c^2*d + 15*B*a^2*b*c*d^2 - 4*B*a^3*d^3)*n - 3*(2*A*b^3*c^2*d + 4*
A*a*b^2*c*d^2 - 6*A*a^2*b*d^3 + (3*B*b^3*c^2*d - 2*B*a*b^2*c*d^2 - B*a^2*b*
d^3)*n)*x + 2*(B*b^3*c^3 - 6*B*a*b^2*c^2*d + 3*B*a^2*b*c*d^2 + 2*B*a^3*d^3
- 6*(B*b^3*c*d^2 - B*a*b^2*d^3)*x^2 - 3*(B*b^3*c^2*d + 2*B*a*b^2*c*d^2 - 3*
B*a^2*b*d^3)*x - 6*(B*b^3*d^3*x^3 + B*a^2*b*c*d^2 + (B*b^3*c*d^2 + 2*B*a*b^
2*d^3)*x^2 + (2*B*a*b^2*c*d^2 + B*a^2*b*d^3)*x)*log((b*x + a)/(d*x + c))*l
og(e) - 2*(6*A*a^2*b*c*d^2 + 3*(B*b^3*d^3*n + 2*A*b^3*d^3)*x^3 + 3*(3*B*b^3
*c*d^2*n + 2*A*b^3*c*d^2 + 4*A*a*b^2*d^3)*x^2 - (B*b^3*c^3 - 6*B*a*b^2*c^2*
d + 2*B*a^3*d^3)*n + 3*(4*A*a*b^2*c*d^2 + 2*A*a^2*b*d^3 + (B*b^3*c^2*d + 4*
B*a*b^2*c*d^2 - 2*B*a^2*b*d^3)*n)*x)*log((b*x + a)/(d*x + c))/((b^6*c^4*d
- 4*a*b^5*c^3*d^2 + 6*a^2*b^4*c^2*d^3 - 4*a^3*b^3*c*d^4 + a^4*b^2*d^5)*g^3*
i^2*x^3 + (b^6*c^5 - 2*a*b^5*c^4*d - 2*a^2*b^4*c^3*d^2 + 8*a^3*b^3*c^2*d^3
- 7*a^4*b^2*c*d^4 + 2*a^5*b*d^5)*g^3*i^2*x^2 + (2*a*b^5*c^5 - 7*a^2*b^4*c^4
*d + 8*a^3*b^3*c^3*d^2 - 2*a^4*b^2*c^2*d^3 - 2*a^5*b*c*d^4 + a^6*d^5)*g^3*i
^2*x + (a^2*b^4*c^5 - 4*a^3*b^3*c^4*d + 6*a^4*b^2*c^3*d^2 - 4*a^5*b*c^2*d^3
+ a^6*c*d^4)*g^3*i^2)

```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)**3/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{B \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A}{(bgx + ag)^3 (dix + ci)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x, a
lgorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c)))^n) + A)/((b*g*x + a*g)^3*(d*i*x +  
c*i)^2), x)
```

$$3.150 \quad \int \frac{A+B \log \left( e^{\left( \frac{a+bx}{c+dx} \right)^n} \right)}{(ag+bgx)^4(ci+dix)^2} dx$$

**Optimal.** Leaf size=477

$$\frac{6b^2d^2(c+dx) \left( B \log \left( e^{\left( \frac{a+bx}{c+dx} \right)^n} \right) + A \right)}{g^4i^2(a+bx)(bc-ad)^5} - \frac{b^4(c+dx)^3 \left( B \log \left( e^{\left( \frac{a+bx}{c+dx} \right)^n} \right) + A \right)}{3g^4i^2(a+bx)^3(bc-ad)^5} + \frac{2b^3d(c+dx)^2 \left( B \log \left( e^{\left( \frac{a+bx}{c+dx} \right)^n} \right) + A \right)}{g^4i^2(a+bx)^2(bc-ad)^5}$$

[Out]  $-\left(\frac{(B*d^4*n*(a+b*x))}{((b*c-a*d)^5*g^4*i^2*(c+d*x))}\right) - \left(\frac{6*b^2*B*d^2*n*(c+d*x)}{((b*c-a*d)^5*g^4*i^2*(a+b*x))} + \frac{(b^3*B*d*n*(c+d*x)^2)}{((b*c-a*d)^5*g^4*i^2*(a+b*x)^2)} - \frac{(b^4*B*n*(c+d*x)^3)}{(9*(b*c-a*d)^5*g^4*i^2*(a+b*x)^3)} + \frac{(d^4*(a+b*x)*(A+B*Log[e*((a+b*x)/(c+d*x))^n])}{((b*c-a*d)^5*g^4*i^2*(c+d*x))} - \frac{(6*b^2*d^2*(c+d*x)*(A+B*Log[e*((a+b*x)/(c+d*x))^n])}{((b*c-a*d)^5*g^4*i^2*(a+b*x))} + \frac{(2*b^3*d*(c+d*x)^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n])}{((b*c-a*d)^5*g^4*i^2*(a+b*x)^2)} - \frac{(b^4*(c+d*x)^3*(A+B*Log[e*((a+b*x)/(c+d*x))^n])}{(3*(b*c-a*d)^5*g^4*i^2*(a+b*x)^3)} - \frac{(4*b*d^3*(A+B*Log[e*((a+b*x)/(c+d*x))^n])*Log[(a+b*x)/(c+d*x)])}{((b*c-a*d)^5*g^4*i^2)} + \frac{(2*b*B*d^3*n*Log[(a+b*x)/(c+d*x])^2)}{((b*c-a*d)^5*g^4*i^2)}$

**Rubi [C]** time = 1.35697, antiderivative size = 735, normalized size of antiderivative = 1.54, number of steps used = 34, number of rules used = 11, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.256$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{4bBd^3n \text{PolyLog} \left( 2, -\frac{d(a+bx)}{bc-ad} \right)}{g^4i^2(bc-ad)^5} - \frac{4bBd^3n \text{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right)}{g^4i^2(bc-ad)^5} - \frac{4bd^3 \log(a+bx) \left( B \log \left( e^{\left( \frac{a+bx}{c+dx} \right)^n} \right) + A \right)}{g^4i^2(bc-ad)^5} - \frac{d^3 \left( B \log \left( e^{\left( \frac{a+bx}{c+dx} \right)^n} \right) + A \right)}{g^4i^2(c+dx)^2}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])/((a\*g + b\*g\*x)^4\*(c\*i + d\*i\*x)^2), x]

[Out]  $-\left(\frac{(b*B*n)}{(9*(b*c-a*d)^2*g^4*i^2*(a+b*x)^3)} + \frac{(2*b*B*d*n)}{(3*(b*c-a*d)^3*g^4*i^2*(a+b*x)^2)} - \frac{(13*b*B*d^2*n)}{(3*(b*c-a*d)^4*g^4*i^2*(a+b*x))} + \frac{(B*d^3*n)}{((b*c-a*d)^4*g^4*i^2*(c+d*x))} - \frac{(10*b*B*d^3*n*Log[a+b*x])}{(3*(b*c-a*d)^5*g^4*i^2)} + \frac{(2*b*B*d^3*n*Log[a+b*x]^2)}{((b*c-a*d)^5*g^4*i^2)} - \frac{(b*(A+B*Log[e*((a+b*x)/(c+d*x))^n])}{(3*(b*c-a*d)^2*g^4*i^2*(a+b*x)^3)} + \frac{(b*d*(A+B*Log[e*((a+b*x)/(c+d*x))^n])}{((b*c-a*d)^3*g^4*i^2*(a+b*x)^2)} - \frac{(3*b*d^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n])}{((b*c-a*d)^4*g^4*i^2*(a+b*x))}$

$$\frac{((b*c - a*d)^4*g^4*i^2*(a + b*x) - (d^3*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))]^n)))/((b*c - a*d)^4*g^4*i^2*(c + d*x) - (4*b*d^3*\text{Log}[a + b*x]*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))]^n)))/((b*c - a*d)^5*g^4*i^2) + (10*b*B*d^3*n*\text{Log}[c + d*x])/(3*(b*c - a*d)^5*g^4*i^2) - (4*b*B*d^3*n*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/(b*c - a*d)^5*g^4*i^2 + (4*b*d^3*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))]^n)*\text{Log}[c + d*x])/(b*c - a*d)^5*g^4*i^2 + (2*b*B*d^3*n*\text{Log}[c + d*x]^2)/((b*c - a*d)^5*g^4*i^2) - (4*b*B*d^3*n*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)])/(b*c - a*d)^5*g^4*i^2 - (4*b*B*d^3*n*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))])/(b*c - a*d)^5*g^4*i^2 - (4*b*B*d^3*n*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])/(b*c - a*d)^5*g^4*i^2$$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFX^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFX, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFX^p])^n - 1)*D[RFX, x])/RFX, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_.))^(m_.)*((c_.) + (d_.)*(x_.))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_.)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFX^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x] /;
```

FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

#### Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*(RFx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]

#### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.)\*(x\_))^(q\_.), x\_Symbol] := Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

#### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] := Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

#### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n]))/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

#### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

#### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] := -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

#### Rubi steps



$$\begin{aligned}
\int \frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(150c + 150dx)^2(ag + bgx)^4} dx &= \int \left( \frac{b^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{22500(bc - ad)^2 g^4 (a + bx)^4} - \frac{b^2 d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{11250(bc - ad)^3 g^4 (a + bx)^3} + \frac{b^2 d^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7500(bc - ad)^4 g^4} \right) dx \\
&= -\frac{(b^2 d^3) \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx} dx}{5625(bc - ad)^5 g^4} + \frac{(bd^4) \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx} dx}{5625(bc - ad)^5 g^4} + \frac{(b^2 d^2) \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^2} dx}{7500(bc - ad)^4 g^4} \\
&= -\frac{b \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{67500(bc - ad)^2 g^4 (a + bx)^3} + \frac{bd \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{22500(bc - ad)^3 g^4 (a + bx)^2} - \frac{bd^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7500(bc - ad)^4 g^4} \\
&= -\frac{b \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{67500(bc - ad)^2 g^4 (a + bx)^3} + \frac{bd \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{22500(bc - ad)^3 g^4 (a + bx)^2} - \frac{bd^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7500(bc - ad)^4 g^4} \\
&= -\frac{b \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{67500(bc - ad)^2 g^4 (a + bx)^3} + \frac{bd \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{22500(bc - ad)^3 g^4 (a + bx)^2} - \frac{bd^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7500(bc - ad)^4 g^4} \\
&= -\frac{bBn}{202500(bc - ad)^2 g^4 (a + bx)^3} + \frac{bBdn}{33750(bc - ad)^3 g^4 (a + bx)^2} - \frac{13bBd^2 n}{67500(bc - ad)^4 g^4} \\
&= -\frac{bBn}{202500(bc - ad)^2 g^4 (a + bx)^3} + \frac{bBdn}{33750(bc - ad)^3 g^4 (a + bx)^2} - \frac{13bBd^2 n}{67500(bc - ad)^4 g^4} \\
&= -\frac{bBn}{202500(bc - ad)^2 g^4 (a + bx)^3} + \frac{bBdn}{33750(bc - ad)^3 g^4 (a + bx)^2} - \frac{13bBd^2 n}{67500(bc - ad)^4 g^4}
\end{aligned}$$

**Mathematica [C]** time = 1.5508, size = 549, normalized size = 1.15

$$-18bBd^3 n \left( \log(a + bx) \left( \log(a + bx) - 2 \log\left(\frac{b(c+dx)}{bc-ad}\right) \right) - 2 \text{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) \right) + 18bBd^3 n \left( 2 \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right) + \log\left(\frac{b(c+dx)}{bc-ad}\right) \right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^4*(c*i + d*i*x)^2), x]
```

```
[Out] -((b*B*(b*c - a*d)^3*n)/(a + b*x)^3 - (6*b*B*d*(b*c - a*d)^2*n)/(a + b*x)^2
+ (27*b^2*B*c*d^2*n)/(a + b*x) - (27*a*b*B*d^3*n)/(a + b*x) + (12*b*B*d^2*
(b*c - a*d)*n)/(a + b*x) - (9*b*B*c*d^3*n)/(c + d*x) + (9*a*B*d^4*n)/(c + d
*x) + 30*b*B*d^3*n*Log[a + b*x] + (3*b*(b*c - a*d)^3*(A + B*Log[e*((a + b*x
)/(c + d*x))^n]))/(a + b*x)^3 - (9*b*d*(b*c - a*d)^2*(A + B*Log[e*((a + b*x
)/(c + d*x))^n]))/(a + b*x)^2 + (27*b*d^2*(b*c - a*d)*(A + B*Log[e*((a + b*
x)/(c + d*x))^n]))/(a + b*x) - (9*d^3*(-(b*c) + a*d)*(A + B*Log[e*((a + b*x
)/(c + d*x))^n]))/(c + d*x) + 36*b*d^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)
/(c + d*x))^n]) - 30*b*B*d^3*n*Log[c + d*x] - 36*b*d^3*(A + B*Log[e*((a + b
*x)/(c + d*x))^n])*Log[c + d*x] - 18*b*B*d^3*n*(Log[a + b*x]*(Log[a + b*x]
- 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) +
a*d)]) + 18*b*B*d^3*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])
*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(9*(b*c - a*d)^5*
g^4*i^2)
```

**Maple [F]** time = 0.769, size = 0, normalized size = 0.

$$\int \frac{1}{(bgx + ag)^4 (dix + ci)^2} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x)
```

**Maxima [B]** time = 2.23904, size = 3460, normalized size = 7.25

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x, a
lgorithm="maxima")
```

```
[Out] -1/3*B*((12*b^3*d^3*x^3 + b^3*c^3 - 5*a*b^2*c^2*d + 13*a^2*b*c*d^2 + 3*a^3*
d^3 + 6*(b^3*c*d^2 + 5*a*b^2*d^3)*x^2 - 2*(b^3*c^2*d - 8*a*b^2*c*d^2 - 11*a
^2*b*d^3)*x)/((b^7*c^4*d - 4*a*b^6*c^3*d^2 + 6*a^2*b^5*c^2*d^3 - 4*a^3*b^4*
c*d^4 + a^4*b^3*d^5)*g^4*i^2*x^4 + (b^7*c^5 - a*b^6*c^4*d - 6*a^2*b^5*c^3*d
```

$$\begin{aligned}
&^2 + 14a^3b^4c^2d^3 - 11a^4b^3cd^4 + 3a^5b^2d^5)g^4i^2x^3 + 3 \\
&*(a^6b^5c^4d - 3a^2b^5c^4d + 2a^3b^4c^3d^2 + 2a^4b^3c^2d^3 - 3a \\
&^5b^2c^2d^4 + a^6b^2d^5)g^4i^2x^2 + (3a^2b^5c^5 - 11a^3b^4c^4d + \\
&14a^4b^3c^3d^2 - 6a^5b^2c^2d^3 - a^6b^2cd^4 + a^7d^5)g^4i^2x \\
&+ (a^3b^4c^5 - 4a^4b^3c^4d + 6a^5b^2c^3d^2 - 4a^6b^2c^2d^3 + a^ \\
&7cd^4)g^4i^2) + 12bd^3\log(bx + a)/((b^5c^5 - 5ab^4c^4d + 10a^ \\
&2b^3c^3d^2 - 10a^3b^2c^2d^3 + 5a^4b^2cd^4 - a^5d^5)g^4i^2) - 12 \\
&bd^3\log(dx + c)/((b^5c^5 - 5ab^4c^4d + 10a^2b^3c^3d^2 - 10a^3 \\
&b^2c^2d^3 + 5a^4b^2cd^4 - a^5d^5)g^4i^2))*\log(e*(bx/(dx + c) + a/ \\
&(dx + c))^n) - 1/9*(b^4c^4 - 9ab^3c^3d + 54a^2b^2c^2d^2 - 55a^3 \\
&b^2cd^3 + 9a^4d^4 + 30*(b^4cd^3 - ab^3d^4)x^3 + 3*(11b^4c^2d^2 + \\
&8ab^3cd^3 - 19a^2b^2d^4)x^2 - 18*(b^4d^4x^4 + a^3b^2cd^3 + (b^4c \\
&d^3 + 3ab^3d^4)x^3 + 3*(ab^3cd^3 + a^2b^2d^4)x^2 + (3a^2b^2c \\
&d^3 + a^3bd^4)x)\log(bx + a)^2 - 18*(b^4d^4x^4 + a^3b^2cd^3 + (b^4c \\
&d^3 + 3ab^3d^4)x^3 + 3*(ab^3cd^3 + a^2b^2d^4)x^2 + (3a^2b^2c \\
&d^3 + a^3bd^4)x)\log(dx + c)^2 - (5b^4c^3d - 81ab^3c^2d^2 + 57a^ \\
&2b^2cd^3 + 19a^3bd^4)x + 30*(b^4d^4x^4 + a^3b^2cd^3 + (b^4cd^3 \\
&+ 3ab^3d^4)x^3 + 3*(ab^3cd^3 + a^2b^2d^4)x^2 + (3a^2b^2cd^3 \\
&+ a^3bd^4)x)\log(bx + a) - 6*(5b^4d^4x^4 + 5a^3b^2cd^3 + 5*(b^4c \\
&d^3 + 3ab^3d^4)x^3 + 15*(ab^3cd^3 + a^2b^2d^4)x^2 + 5*(3a^2b^2 \\
&cd^3 + a^3bd^4)x - 6*(b^4d^4x^4 + a^3b^2cd^3 + (b^4cd^3 + 3ab^3 \\
&d^4)x^3 + 3*(ab^3cd^3 + a^2b^2d^4)x^2 + (3a^2b^2cd^3 + a^3bd^4 \\
&x)\log(bx + a))\log(dx + c))*Bn/(a^3b^5c^6g^4i^2 - 5a^4b^4c^5 \\
&d^2g^4i^2 + 10a^5b^3c^4d^2g^4i^2 - 10a^6b^2c^3d^3g^4i^2 + 5a^7 \\
&b^2cd^4g^4i^2 - a^8cd^5g^4i^2 + (b^8c^5d^2g^4i^2 - 5ab^7c^4d \\
&^2g^4i^2 + 10a^2b^6c^3d^3g^4i^2 - 10a^3b^5c^2d^4g^4i^2 + 5a^ \\
&4b^4cd^5g^4i^2 - a^5b^3d^6g^4i^2))x^4 + (b^8c^6g^4i^2 - 2ab^7 \\
&c^5d^2g^4i^2 - 5a^2b^6c^4d^2g^4i^2 + 20a^3b^5c^3d^3g^4i^2 - 2 \\
&5a^4b^4c^2d^4g^4i^2 + 14a^5b^3cd^5g^4i^2 - 3a^6b^2d^6g^4i^ \\
&2)x^3 + 3*(ab^7c^6g^4i^2 - 4a^2b^6c^5d^2g^4i^2 + 5a^3b^5c^4d^2 \\
&g^4i^2 - 5a^5b^3c^2d^4g^4i^2 + 4a^6b^2cd^5g^4i^2 - a^7bd^6g^ \\
&4i^2)x^2 + (3a^2b^6c^6g^4i^2 - 14a^3b^5c^5d^2g^4i^2 + 25a^4b \\
&^4c^4d^2g^4i^2 - 20a^5b^3c^3d^3g^4i^2 + 5a^6b^2c^2d^4g^4i^2 \\
&+ 2a^7b^2cd^5g^4i^2 - a^8d^6g^4i^2)x) - 1/3A*((12b^3d^3x^3 + b \\
&^3c^3 - 5ab^2c^2d + 13a^2b^2cd^2 + 3a^3d^3 + 6*(b^3cd^2 + 5ab^ \\
&2d^3)x^2 - 2*(b^3c^2d - 8ab^2cd^2 - 11a^2bd^3)x)/((b^7c^4d - \\
&4ab^6c^3d^2 + 6a^2b^5c^2d^3 - 4a^3b^4cd^4 + a^4b^3d^5)g^4i^ \\
&2x^4 + (b^7c^5 - ab^6c^4d - 6a^2b^5c^3d^2 + 14a^3b^4c^2d^3 - 1 \\
&1a^4b^3cd^4 + 3a^5b^2d^5)g^4i^2x^3 + 3*(ab^6c^5 - 3a^2b^5c^4 \\
&d + 2a^3b^4c^3d^2 + 2a^4b^3c^2d^3 - 3a^5b^2cd^4 + a^6bd^5)g^ \\
&4i^2x^2 + (3a^2b^5c^5 - 11a^3b^4c^4d + 14a^4b^3c^3d^2 - 6a^5 \\
&b^2c^2d^3 - a^6b^2cd^4 + a^7d^5)g^4i^2x + (a^3b^4c^5 - 4a^4b^3c \\
&^4d + 6a^5b^2c^3d^2 - 4a^6b^2c^2d^3 + a^7cd^4)g^4i^2) + 12bd^ \\
&3\log(bx + a)/((b^5c^5 - 5ab^4c^4d + 10a^2b^3c^3d^2 - 10a^3b^2c \\
&^2d^3 + 5a^4b^2cd^4 - a^5d^5)g^4i^2) - 12bd^3\log(dx + c)/((b^5c
\end{aligned}$$

$$^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^4*i^2))$$

**Fricas [B]** time = 0.681035, size = 3012, normalized size = 6.31

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^4/(d\*i\*x+c\*i)^2,x, algorithm="fricas")

[Out] 
$$\begin{aligned} & -1/9*(3*A*b^4*c^4 - 18*A*a*b^3*c^3*d + 54*A*a^2*b^2*c^2*d^2 - 30*A*a^3*b*c*d^3 - 9*A*a^4*d^4 + 6*(6*A*b^4*c*d^3 - 6*A*a*b^3*d^4 + 5*(B*b^4*c*d^3 - B*a*b^3*d^4)*n)*x^3 + 3*(6*A*b^4*c^2*d^2 + 24*A*a*b^3*c*d^3 - 30*A*a^2*b^2*d^4 + (11*B*b^4*c^2*d^2 + 8*B*a*b^3*c*d^3 - 19*B*a^2*b^2*d^4)*n)*x^2 + 18*(B*b^4*d^4*n*x^4 + B*a^3*b*c*d^3*n + (B*b^4*c*d^3 + 3*B*a*b^3*d^4)*n*x^3 + 3*(B*a*b^3*c*d^3 + B*a^2*b^2*d^4)*n*x^2 + (3*B*a^2*b^2*c*d^3 + B*a^3*b*d^4)*n*x) * \log((b*x + a)/(d*x + c))^2 + (B*b^4*c^4 - 9*B*a*b^3*c^3*d + 54*B*a^2*b^2*c^2*d^2 - 55*B*a^3*b*c*d^3 + 9*B*a^4*d^4)*n - (6*A*b^4*c^3*d - 54*A*a*b^3*c^2*d^2 - 18*A*a^2*b^2*c*d^3 + 66*A*a^3*b*d^4 + (5*B*b^4*c^3*d - 81*B*a*b^3*c^2*d^2 + 57*B*a^2*b^2*c*d^3 + 19*B*a^3*b*d^4)*n)*x + 3*(B*b^4*c^4 - 6*B*a*b^3*c^3*d + 18*B*a^2*b^2*c^2*d^2 - 10*B*a^3*b*c*d^3 - 3*B*a^4*d^4 + 12*(B*b^4*c*d^3 - B*a*b^3*d^4)*x^3 + 6*(B*b^4*c^2*d^2 + 4*B*a*b^3*c*d^3 - 5*B*a^2*b^2*d^4)*x^2 - 2*(B*b^4*c^3*d - 9*B*a*b^3*c^2*d^2 - 3*B*a^2*b^2*c*d^3 + 11*B*a^3*b*d^4)*x + 12*(B*b^4*d^4*x^4 + B*a^3*b*c*d^3 + (B*b^4*c*d^3 + 3*B*a*b^3*d^4)*x^3 + 3*(B*a*b^3*c*d^3 + B*a^2*b^2*d^4)*x^2 + (3*B*a^2*b^2*c*d^3 + B*a^3*b*d^4)*x) * \log((b*x + a)/(d*x + c)) * \log(e) + 3*(12*A*a^3*b*c*d^3 + 2*(5*B*b^4*d^4*n + 6*A*b^4*d^4)*x^4 + 2*(6*A*b^4*c*d^3 + 18*A*a*b^3*d^4 + (11*B*b^4*c*d^3 + 9*B*a*b^3*d^4)*n)*x^3 + 6*(6*A*a*b^3*c*d^3 + 6*A*a^2*b^2*d^4 + (B*b^4*c^2*d^2 + 9*B*a*b^3*c*d^3)*n)*x^2 + (B*b^4*c^4 - 6*B*a*b^3*c^3*d + 18*B*a^2*b^2*c^2*d^2 - 3*B*a^4*d^4)*n + 2*(18*A*a^2*b^2*c*d^3 + 6*A*a^3*b*d^4 - (B*b^4*c^3*d - 9*B*a*b^3*c^2*d^2 - 18*B*a^2*b^2*c*d^3 + 6*B*a^3*b*d^4)*n)*x) * \log((b*x + a)/(d*x + c)) / ((b^8*c^5*d - 5*a*b^7*c^4*d^2 + 10*a^2*b^6*c^3*d^3 - 10*a^3*b^5*c^2*d^4 + 5*a^4*b^4*c*d^5 - a^5*b^3*d^6)*g^4*i^2*x^4 + (b^8*c^6 - 2*a*b^7*c^5*d - 5*a^2*b^6*c^4*d^2 + 20*a^3*b^5*c^3*d^3 - 25*a^4*b^4*c^2*d^4 + 14*a^5*b^3*c*d^5 - 3*a^6*b^2*d^6)*g^4*i^2*x^3 + 3*(a*b^7*c^6 - 4*a^2*b^6*c^5*d + 5*a^3*b^5*c^4*d^2 - 5*a^5*b^3*c^2*d^4 + 4*a^6*b^2*c*d^5 - a^7*b*d^6)*g^4*i^2*x^2 + (3*a^2*b^6*c^6 - 14*a^3*b^5*c^5*d + 25*a^4*b^4*c^4*d^2 - 20*a^5*b^3*c^3*d^3 + 5*a^6*b^2*c^2*d^4 + 2*a^7*b*c*d^5 - a^8*d^6)*g^4*i^2*x + (a^3*b^5*c^6 - 5*a^4*b^4*c^5*d + 10*a^5*b^3*c^4*d^2 - 10*a^6*b^2*c^3*d^3 + 5*a^7*b*c^2*d^4 - a^8*c*d^5)*g^4*i^2)$$

---

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n))/(b\*g\*x+a\*g)\*\*4/(d\*i\*x+c\*i)\*\*2,x)

[Out] Timed out

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A}{(bgx + ag)^4 (dix + ci)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^4/(d\*i\*x+c\*i)^2,x, algorithm="giac")

[Out] integrate((B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)/((b\*g\*x + a\*g)^4\*(d\*i\*x + c\*i)^2), x)

$$3.151 \quad \int \frac{(ag+bgx)^3 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ci+dix)^3} dx$$

**Optimal.** Leaf size=382

$$\frac{3b^2Bg^3n(bc-ad)\text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)}{d^4i^3} + \frac{b^2g^3(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(3B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+3A+Bn\right)}{d^4i^3} + \frac{g^3(a+bx)^2(bc-ad)}{d^4i^3}$$

[Out]  $(-3*B*(b*c - a*d)*g^3*n*(a + b*x)^2)/(4*d^2*i^3*(c + d*x)^2) - (3*b*B*(b*c - a*d)*g^3*n*(a + b*x))/(d^3*i^3*(c + d*x)) + (b*(b*c - a*d)*g^3*(3*A + B*n)*(a + b*x))/(d^3*i^3*(c + d*x)) + (3*b*B*(b*c - a*d)*g^3*(a + b*x)*\text{Log}[e*((a + b*x)/(c + d*x))^n]/(d^3*i^3*(c + d*x)) + (g^3*(a + b*x)^3*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])/(d*i^3*(c + d*x)^2) + ((b*c - a*d)*g^3*(a + b*x)^2*(3*A + B*n + 3*B*\text{Log}[e*((a + b*x)/(c + d*x))^n])/(2*d^2*i^3*(c + d*x)^2) + (b^2*(b*c - a*d)*g^3*(3*A + B*n + 3*B*\text{Log}[e*((a + b*x)/(c + d*x))^n])*\text{Log}[(b*c - a*d)/(b*(c + d*x))])/(d^4*i^3) + (3*b^2*B*(b*c - a*d)*g^3*n*\text{PolyLog}[2, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i^3)$

**Rubi [A]** time = 0.7455, antiderivative size = 461, normalized size of antiderivative = 1.21, number of steps used = 21, number of rules used = 13, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.302$ , Rules used = {2528, 2486, 31, 2525, 12, 44, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{3b^2Bg^3n(bc-ad)\text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{d^4i^3} - \frac{3b^2g^3(bc-ad)\log(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^4i^3} - \frac{3bg^3(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^4i^3(c+dx)}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[(a*g + b*g*x)^3*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])/(c*i + d*i*x)^3, x]$

[Out]  $(A*b^3*g^3*x)/(d^3*i^3) - (B*(b*c - a*d)^3*g^3*n)/(4*d^4*i^3*(c + d*x)^2) + (5*b*B*(b*c - a*d)^2*g^3*n)/(2*d^4*i^3*(c + d*x)) + (5*b^2*B*(b*c - a*d)*g^3*n*\text{Log}[a + b*x])/(2*d^4*i^3) + (b^2*B*g^3*(a + b*x)*\text{Log}[e*((a + b*x)/(c + d*x))^n]/(d^3*i^3) + ((b*c - a*d)^3*g^3*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])/(2*d^4*i^3*(c + d*x)^2) - (3*b*(b*c - a*d)^2*g^3*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])/(d^4*i^3*(c + d*x)) - (7*b^2*B*(b*c - a*d)*g^3*n*\text{Log}[c + d*x])/(2*d^4*i^3) + (3*b^2*B*(b*c - a*d)*g^3*n*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/(d^4*i^3) - (3*b^2*(b*c - a*d)*g^3*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])*\text{Log}[c + d*x])/(d^4*i^3) - (3*b^2*B*(b*c - a*d)*g^3*n*$

$\text{Log}[c + d*x]^2/(2*d^4*i^3) + (3*b^2*B*(b*c - a*d)*g^3*n*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]/(d^4*i^3)$

### Rule 2528

$\text{Int}[(a_.) + \text{Log}[(c_.)*(RFX_)^(p_.)]*(b_.)]^(n_.)*(RGx_), x\_Symbol] \rightarrow \text{With}[\{u = \text{ExpandIntegrand}[(a + b*\text{Log}[c*RFX^p])^n, RGx, x]\}, \text{Int}[u, x] /; \text{SumQ}[u]] /; \text{FreeQ}\{a, b, c, p\}, x\} \&\& \text{RationalFunctionQ}[RFX, x] \&\& \text{RationalFunctionQ}[RGx, x] \&\& \text{IGtQ}[n, 0]$

### Rule 2486

$\text{Int}[\text{Log}[(e_.)*((f_.)*((a_.) + (b_.)*(x_.))^(p_.))*((c_.) + (d_.)*(x_.))^(q_.))]^(r_.)]^(s_.), x\_Symbol] \rightarrow \text{Simp}[(a + b*x)*\text{Log}[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s/b, x] + \text{Dist}[(q*r*s*(b*c - a*d))/b, \text{Int}[\text{Log}[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; \text{FreeQ}\{a, b, c, d, e, f, p, q, r, s\}, x\} \&\& \text{NeQ}[b*c - a*d, 0] \&\& \text{EqQ}[p + q, 0] \&\& \text{IGtQ}[s, 0]$

### Rule 31

$\text{Int}[(a_) + (b_.)*(x_.)]^(-1), x\_Symbol] \rightarrow \text{Simp}[\text{Log}[\text{RemoveContent}[a + b*x, x]]/b, x] /; \text{FreeQ}\{a, b\}, x]$

### Rule 2525

$\text{Int}[(a_.) + \text{Log}[(c_.)*(RFX_)^(p_.)]*(b_.)]^(n_.)*((d_.) + (e_.)*(x_.))^(m_.), x\_Symbol] \rightarrow \text{Simp}[(d + e*x)^(m + 1)*(a + b*\text{Log}[c*RFX^p])^n/(e*(m + 1)), x] - \text{Dist}[(b*n*p)/(e*(m + 1)), \text{Int}[\text{SimplifyIntegrand}[(d + e*x)^(m + 1)*(a + b*\text{Log}[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x], x] /; \text{FreeQ}\{a, b, c, d, e, m, p\}, x\} \&\& \text{RationalFunctionQ}[RFX, x] \&\& \text{IGtQ}[n, 0] \&\& (\text{EqQ}[n, 1] \|\ \text{IntegerQ}[m]) \&\& \text{NeQ}[m, -1]$

### Rule 12

$\text{Int}[(a_)*(u_), x\_Symbol] \rightarrow \text{Dist}[a, \text{Int}[u, x], x] /; \text{FreeQ}[a, x] \&\& \text{!MatchQ}[u, (b_.)*(v_.)] /; \text{FreeQ}[b, x]$

### Rule 44

$\text{Int}[(a_) + (b_.)*(x_.)]^(m_.)*((c_.) + (d_.)*(x_.))^(n_.), x\_Symbol] \rightarrow \text{Int}[\text{ExpandIntegrand}[(a + b*x)^m*(c + d*x)^n, x], x] /; \text{FreeQ}\{a, b, c, d\}, x\} \&\& \text{NeQ}[b*c - a*d, 0] \&\& \text{ILtQ}[m, 0] \&\& \text{IntegerQ}[n] \&\& \text{!(IGtQ}[n, 0] \&\& \text{LtQ}[m + n + 2, 0])$

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFX^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFX_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFX, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFX, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_))^(n_.)]*(b_.)/(x_), x_Symbol] := Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```



Rubi steps

$$\begin{aligned}
\int \frac{(ag + bgx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(151c + 151dx)^3} dx &= \int \left( \frac{b^3 g^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3442951d^3} + \frac{(-bc + ad)^3 g^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3442951d^3 (c + dx)^3} \right) dx \\
&= \frac{(b^3 g^3) \int \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx}{3442951d^3} - \frac{(3b^2(bc - ad)g^3) \int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{c+dx}}{3442951d^3} \\
&= \frac{Ab^3 g^3 x}{3442951d^3} + \frac{(bc - ad)^3 g^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{6885902d^4 (c + dx)^2} - \frac{3b(bc - ad)^2 g^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3442951d^3} \\
&= \frac{Ab^3 g^3 x}{3442951d^3} + \frac{b^2 B g^3 (a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{3442951d^3} + \frac{(bc - ad)^3 g^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{6885902d^4 (c + dx)} \\
&= \frac{Ab^3 g^3 x}{3442951d^3} + \frac{b^2 B g^3 (a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{3442951d^3} + \frac{(bc - ad)^3 g^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{6885902d^4 (c + dx)} \\
&= \frac{Ab^3 g^3 x}{3442951d^3} - \frac{B(bc - ad)^3 g^3 n}{13771804d^4 (c + dx)^2} + \frac{5bB(bc - ad)^2 g^3 n}{6885902d^4 (c + dx)} + \frac{5b^2 B(bc - ad) g^3 n}{6885902d^4 (c + dx)} \\
&= \frac{Ab^3 g^3 x}{3442951d^3} - \frac{B(bc - ad)^3 g^3 n}{13771804d^4 (c + dx)^2} + \frac{5bB(bc - ad)^2 g^3 n}{6885902d^4 (c + dx)} + \frac{5b^2 B(bc - ad) g^3 n}{6885902d^4 (c + dx)} \\
&= \frac{Ab^3 g^3 x}{3442951d^3} - \frac{B(bc - ad)^3 g^3 n}{13771804d^4 (c + dx)^2} + \frac{5bB(bc - ad)^2 g^3 n}{6885902d^4 (c + dx)} + \frac{5b^2 B(bc - ad) g^3 n}{6885902d^4 (c + dx)}
\end{aligned}$$

**Mathematica [A]** time = 0.484582, size = 334, normalized size = 0.87

$$g^3 \left( 6b^2 B n (bc - ad) \left( 2 \text{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right) + \log(c + dx) \left( 2 \log \left( \frac{d(a+bx)}{ad-bc} \right) - \log(c + dx) \right) \right) - 12b^2 (bc - ad) \log(c + dx) \left( B \right) \right)$$

Antiderivative was successfully verified.

[In] Integrate[((a\*g + b\*g\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(c\*i + d\*i\*x)^3,x]

```
[Out] (g^3*(4*A*b^3*d*x - (B*(b*c - a*d)^3*n)/(c + d*x)^2 + (10*b*B*(b*c - a*d)^2
*n)/(c + d*x) + 10*b^2*B*(b*c - a*d)*n*Log[a + b*x] + 4*b^2*B*d*(a + b*x)*L
og[e*((a + b*x)/(c + d*x))^n] + (2*(b*c - a*d)^3*(A + B*Log[e*((a + b*x)/(c
+ d*x))^n]))/(c + d*x)^2 - (12*b*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c
+ d*x))^n]))/(c + d*x) - 14*b^2*B*(b*c - a*d)*n*Log[c + d*x] - 12*b^2*(b*c
- a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + 6*b^2*B*(b*c -
a*d)*n*((2*Log[(d*(a + b*x))/(-b*c) + a*d]) - Log[c + d*x])*Log[c + d*x]
+ 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(4*d^4*i^3)
```

**Maple [F]** time = 0.605, size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^3}{(dix + ci)^3} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x)
```

```
[Out] int((b*g*x+a*g)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x)
```

**Maxima [B]** time = 3.13512, size = 3907, normalized size = 10.23

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x, a
lgorithm="maxima")
```

```
[Out] 3/4*B*a^2*b*g^3*n*((b*c^2 - 3*a*c*d + 2*(b*c*d - 2*a*d^2)*x)/((b*c*d^4 - a*
d^5)*i^3*x^2 + 2*(b*c^2*d^3 - a*c*d^4)*i^3*x + (b*c^3*d^2 - a*c^2*d^3)*i^3)
+ 2*(b^2*c - 2*a*b*d)*log(b*x + a)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*
i^3) - 2*(b^2*c - 2*a*b*d)*log(d*x + c)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d
^4)*i^3)) + 1/4*B*a^3*g^3*n*((2*b*d*x + 3*b*c - a*d)/((b*c*d^3 - a*d^4)*i^3
*x^2 + 2*(b*c^2*d^2 - a*c*d^3)*i^3*x + (b*c^3*d - a*c^2*d^2)*i^3) + 2*b^2*1
og(b*x + a)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3) - 2*b^2*log(d*x + c)/
((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3)) - 1/2*A*b^3*g^3*((6*c^2*d*x + 5*
c^3)/(d^6*i^3*x^2 + 2*c*d^5*i^3*x + c^2*d^4*i^3) - 2*x/(d^3*i^3) + 6*c*log(
d*x + c)/(d^4*i^3)) + 3/2*A*a*b^2*g^3*((4*c*d*x + 3*c^2)/(d^5*i^3*x^2 + 2*c
```

$$\begin{aligned}
& *d^4i^3x + c^2d^3i^3) + 2*\log(dx + c)/(d^3i^3)) - 3/2*(2dx + c)*B*a \\
& ^2*b*g^3*\log(e*(b*x/(dx + c) + a/(dx + c))^n)/(d^4i^3*x^2 + 2*c*d^3i^3*x \\
& x + c^2*d^2i^3) - 3/2*(2dx + c)*A*a^2*b*g^3/(d^4i^3*x^2 + 2*c*d^3i^3*x \\
& + c^2*d^2i^3) - 1/2*B*a^3*g^3*\log(e*(b*x/(dx + c) + a/(dx + c))^n)/(d^3 \\
& *i^3*x^2 + 2*c*d^2i^3*x + c^2*d*i^3) - 1/2*A*a^3*g^3/(d^3i^3*x^2 + 2*c*d^ \\
& 2*i^3*x + c^2*d*i^3) + 1/2*(6*a^3*b^2*d^3*g^3*\log(e) - (7*g^3*n + 6*g^3*\log \\
& (e))*b^5*c^3 + (19*g^3*n + 18*g^3*\log(e))*a*b^4*c^2*d - 2*(7*g^3*n + 9*g^3* \\
& \log(e))*a^2*b^3*c*d^2)*B*\log(dx + c)/(b^2*c^2*d^4i^3 - 2*a*b*c*d^5i^3 + \\
& a^2*d^6i^3) + 1/4*(4*(b^5*c^2*d^3*g^3*\log(e) - 2*a*b^4*c*d^4*g^3*\log(e) + \\
& a^2*b^3*d^5*g^3*\log(e))*B*x^3 + 8*(b^5*c^3*d^2*g^3*\log(e) - 2*a*b^4*c^2*d^3 \\
& *g^3*\log(e) + a^2*b^3*c*d^4*g^3*\log(e))*B*x^2 + 2*((5*g^3*n - 4*g^3*\log(e)) \\
& *b^5*c^4*d - 20*(g^3*n - g^3*\log(e))*a*b^4*c^3*d^2 + (27*g^3*n - 28*g^3*\log \\
& (e))*a^2*b^3*c^2*d^3 - 12*(g^3*n - g^3*\log(e))*a^3*b^2*c*d^4)*B*x + 12*((b^ \\
& 5*c^3*d^2*g^3*n - 3*a*b^4*c^2*d^3*g^3*n + 3*a^2*b^3*c*d^4*g^3*n - a^3*b^2*d \\
& ^5*g^3*n)*B*x^2 + 2*(b^5*c^4*d*g^3*n - 3*a*b^4*c^3*d^2*g^3*n + 3*a^2*b^3*c^ \\
& 2*d^3*g^3*n - a^3*b^2*c*d^4*g^3*n)*B*x + (b^5*c^5*g^3*n - 3*a*b^4*c^4*d*g^3 \\
& *n + 3*a^2*b^3*c^3*d^2*g^3*n - a^3*b^2*c^2*d^3*g^3*n)*B)*\log(b*x + a)*\log(d \\
& *x + c) - 6*((b^5*c^3*d^2*g^3*n - 3*a*b^4*c^2*d^3*g^3*n + 3*a^2*b^3*c*d^4*g \\
& ^3*n - a^3*b^2*d^5*g^3*n)*B*x^2 + 2*(b^5*c^4*d*g^3*n - 3*a*b^4*c^3*d^2*g^3* \\
& n + 3*a^2*b^3*c^2*d^3*g^3*n - a^3*b^2*c*d^4*g^3*n)*B*x + (b^5*c^5*g^3*n - 3 \\
& *a*b^4*c^4*d*g^3*n + 3*a^2*b^3*c^3*d^2*g^3*n - a^3*b^2*c^2*d^3*g^3*n)*B)*\lo \\
& g(dx + c)^2 + ((9*g^3*n - 10*g^3*\log(e))*b^5*c^5 - (35*g^3*n - 38*g^3*\log( \\
& e))*a*b^4*c^4*d + (47*g^3*n - 46*g^3*\log(e))*a^2*b^3*c^3*d^2 - 3*(7*g^3*n - \\
& 6*g^3*\log(e))*a^3*b^2*c^2*d^3)*B + 2*((5*b^5*c^3*d^2*g^3*n - 13*a*b^4*c^2* \\
& d^3*g^3*n + 8*a^2*b^3*c*d^4*g^3*n + 2*a^3*b^2*d^5*g^3*n)*B*x^2 + 2*(5*b^5*c \\
& ^4*d*g^3*n - 13*a*b^4*c^3*d^2*g^3*n + 8*a^2*b^3*c^2*d^3*g^3*n + 2*a^3*b^2*c \\
& *d^4*g^3*n)*B*x + (5*b^5*c^5*g^3*n - 13*a*b^4*c^4*d*g^3*n + 8*a^2*b^3*c^3*d \\
& ^2*g^3*n + 2*a^3*b^2*c^2*d^3*g^3*n)*B)*\log(b*x + a) + 2*(2*(b^5*c^2*d^3*g^3 \\
& - 2*a*b^4*c*d^4*g^3 + a^2*b^3*d^5*g^3)*B*x^3 + 4*(b^5*c^3*d^2*g^3 - 2*a*b^ \\
& 4*c^2*d^3*g^3 + a^2*b^3*c*d^4*g^3)*B*x^2 - 4*(b^5*c^4*d*g^3 - 5*a*b^4*c^3*d \\
& ^2*g^3 + 7*a^2*b^3*c^2*d^3*g^3 - 3*a^3*b^2*c*d^4*g^3)*B*x - (5*b^5*c^5*g^3 \\
& - 19*a*b^4*c^4*d*g^3 + 23*a^2*b^3*c^3*d^2*g^3 - 9*a^3*b^2*c^2*d^3*g^3)*B - \\
& 6*((b^5*c^3*d^2*g^3 - 3*a*b^4*c^2*d^3*g^3 + 3*a^2*b^3*c*d^4*g^3 - a^3*b^2*d \\
& ^5*g^3)*B*x^2 + 2*(b^5*c^4*d*g^3 - 3*a*b^4*c^3*d^2*g^3 + 3*a^2*b^3*c^2*d^3* \\
& g^3 - a^3*b^2*c*d^4*g^3)*B*x + (b^5*c^5*g^3 - 3*a*b^4*c^4*d*g^3 + 3*a^2*b^3 \\
& *c^3*d^2*g^3 - a^3*b^2*c^2*d^3*g^3)*B)*\log(dx + c))*\log((b*x + a)^n) - 2*( \\
& 2*(b^5*c^2*d^3*g^3 - 2*a*b^4*c*d^4*g^3 + a^2*b^3*d^5*g^3)*B*x^3 + 4*(b^5*c^ \\
& 3*d^2*g^3 - 2*a*b^4*c^2*d^3*g^3 + a^2*b^3*c*d^4*g^3)*B*x^2 - 4*(b^5*c^4*d*g \\
& ^3 - 5*a*b^4*c^3*d^2*g^3 + 7*a^2*b^3*c^2*d^3*g^3 - 3*a^3*b^2*c*d^4*g^3)*B*x \\
& - (5*b^5*c^5*g^3 - 19*a*b^4*c^4*d*g^3 + 23*a^2*b^3*c^3*d^2*g^3 - 9*a^3*b^2 \\
& *c^2*d^3*g^3)*B - 6*((b^5*c^3*d^2*g^3 - 3*a*b^4*c^2*d^3*g^3 + 3*a^2*b^3*c*d \\
& ^4*g^3 - a^3*b^2*d^5*g^3)*B*x^2 + 2*(b^5*c^4*d*g^3 - 3*a*b^4*c^3*d^2*g^3 + \\
& 3*a^2*b^3*c^2*d^3*g^3 - a^3*b^2*c*d^4*g^3)*B*x + (b^5*c^5*g^3 - 3*a*b^4*c^4 \\
& *d*g^3 + 3*a^2*b^3*c^3*d^2*g^3 - a^3*b^2*c^2*d^3*g^3)*B)*\log(dx + c))*\log( \\
& (dx + c)^n)/(b^2*c^4*d^4i^3 - 2*a*b*c^3*d^5i^3 + a^2*c^2*d^6i^3 + (b^2
\end{aligned}$$

$$*c^2*d^6*i^3 - 2*a*b*c*d^7*i^3 + a^2*d^8*i^3)*x^2 + 2*(b^2*c^3*d^5*i^3 - 2*a*b*c^2*d^6*i^3 + a^2*c*d^7*i^3)*x) - 3*(b^3*c*g^3*n - a*b^2*d*g^3*n)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B/(d^4*i^3)$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{Ab^3g^3x^3 + 3Aab^2g^3x^2 + 3Aa^2bg^3x + Aa^3g^3 + (Bb^3g^3x^3 + 3Bab^2g^3x^2 + 3Ba^2bg^3x + Ba^3g^3) \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}{d^3i^3x^3 + 3cd^2i^3x^2 + 3c^2di^3x + c^3i^3}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)^3,x, algorithm="fricas")

[Out] integral((A\*b^3\*g^3\*x^3 + 3\*A\*a\*b^2\*g^3\*x^2 + 3\*A\*a^2\*b\*g^3\*x + A\*a^3\*g^3 + (B\*b^3\*g^3\*x^3 + 3\*B\*a\*b^2\*g^3\*x^2 + 3\*B\*a^2\*b\*g^3\*x + B\*a^3\*g^3)\*log(e\*((b\*x + a)/(d\*x + c))^n))/(d^3\*i^3\*x^3 + 3\*c\*d^2\*i^3\*x^2 + 3\*c^2\*d\*i^3\*x + c^3\*i^3), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*\*3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n))/(d\*i\*x+c\*i)\*\*3,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^3 \left( B \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A \right)}{(dix + ci)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)/(d*i*x + c*i)^3, x)
```

$$3.152 \quad \int \frac{(ag+bgx)^2 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(ci+dix)^3} dx$$

**Optimal.** Leaf size=263

$$\frac{b^2 B g^2 n \text{PolyLog} \left( 2, \frac{d(a+bx)}{b(c+dx)} \right)}{d^3 i^3} - \frac{b^2 g^2 \log \left( \frac{bc-ad}{b(c+dx)} \right) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{d^3 i^3} - \frac{g^2 (a+bx)^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{2 d i^3 (c+dx)^2} - \frac{A b g^2}{d^2 i^3}$$

[Out] (B\*g<sup>2</sup>\*n\*(a + b\*x)<sup>2</sup>/(4\*d\*i<sup>3</sup>\*(c + d\*x)<sup>2</sup>) - (A\*b\*g<sup>2</sup>\*(a + b\*x))/(d<sup>2</sup>\*i<sup>3</sup>\*(c + d\*x)) + (b\*B\*g<sup>2</sup>\*n\*(a + b\*x))/(d<sup>2</sup>\*i<sup>3</sup>\*(c + d\*x)) - (b\*B\*g<sup>2</sup>\*(a + b\*x)\*Log[e\*((a + b\*x)/(c + d\*x))<sup>n</sup>]/(d<sup>2</sup>\*i<sup>3</sup>\*(c + d\*x)) - (g<sup>2</sup>\*(a + b\*x)<sup>2</sup>\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))<sup>n</sup>]))/(2\*d\*i<sup>3</sup>\*(c + d\*x)<sup>2</sup>) - (b<sup>2</sup>\*g<sup>2</sup>\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))<sup>n</sup>])\*Log[(b\*c - a\*d)/(b\*(c + d\*x))]/(d<sup>3</sup>\*i<sup>3</sup>) - (b<sup>2</sup>\*B\*g<sup>2</sup>\*n\*PolyLog[2, (d\*(a + b\*x))/(b\*(c + d\*x))]/(d<sup>3</sup>\*i<sup>3</sup>))

**Rubi [A]** time = 0.597234, antiderivative size = 356, normalized size of antiderivative = 1.35, number of steps used = 18, number of rules used = 11, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.256$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{b^2 B g^2 n \text{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right)}{d^3 i^3} + \frac{b^2 g^2 \log(c+dx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{d^3 i^3} + \frac{2 b g^2 (bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{d^3 i^3 (c+dx)} - \frac{g^2 (a+bx)^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{2 d i^3 (c+dx)^2}$$

Antiderivative was successfully verified.

[In] Int[((a\*g + b\*g\*x)<sup>2</sup>\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))<sup>n</sup>]))/(c\*i + d\*i\*x)<sup>3</sup>, x]

[Out] (B\*(b\*c - a\*d)<sup>2</sup>\*g<sup>2</sup>\*n)/(4\*d<sup>3</sup>\*i<sup>3</sup>\*(c + d\*x)<sup>2</sup>) - (3\*b\*B\*(b\*c - a\*d)\*g<sup>2</sup>\*n)/(2\*d<sup>3</sup>\*i<sup>3</sup>\*(c + d\*x)) - (3\*b<sup>2</sup>\*B\*g<sup>2</sup>\*n\*Log[a + b\*x]/(2\*d<sup>3</sup>\*i<sup>3</sup>) - ((b\*c - a\*d)<sup>2</sup>\*g<sup>2</sup>\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))<sup>n</sup>]))/(2\*d<sup>3</sup>\*i<sup>3</sup>\*(c + d\*x)<sup>2</sup>) + (2\*b\*(b\*c - a\*d)\*g<sup>2</sup>\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))<sup>n</sup>]))/(d<sup>3</sup>\*i<sup>3</sup>\*(c + d\*x)) + (3\*b<sup>2</sup>\*B\*g<sup>2</sup>\*n\*Log[c + d\*x]/(2\*d<sup>3</sup>\*i<sup>3</sup>) - (b<sup>2</sup>\*B\*g<sup>2</sup>\*n\*Log[-((d\*(a + b\*x))/(b\*c - a\*d))]\*Log[c + d\*x]/(d<sup>3</sup>\*i<sup>3</sup>) + (b<sup>2</sup>\*g<sup>2</sup>\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))<sup>n</sup>])\*Log[c + d\*x]/(d<sup>3</sup>\*i<sup>3</sup>) + (b<sup>2</sup>\*B\*g<sup>2</sup>\*n\*Log[c + d\*x]<sup>2</sup>)/(2\*d<sup>3</sup>\*i<sup>3</sup>) - (b<sup>2</sup>\*B\*g<sup>2</sup>\*n\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)]/(d<sup>3</sup>\*i<sup>3</sup>))

Rule 2528

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(Rfx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, Rfx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
Rfx, x] && IntegerQ[p]
```

### Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n])/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
```

, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))])\* (b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] := -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))])\* (b\_.))^(p\_.)\*((f\_) + (g\_.)\*(x\_)^(q\_.)), x\_Symbol] := Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)])\*(b\_.))/(x\_), x\_Symbol] := Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rubi steps



$$\begin{aligned}
\int \frac{(ag + bgx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(152c + 152dx)^3} dx &= \int \left( \frac{(-bc + ad)^2 g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3511808d^2(c + dx)^3} - \frac{b(bc - ad)g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{1755904d^2(c + dx)^2} \right) dx \\
&= \frac{(b^2 g^2) \int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{c+dx} dx}{3511808d^2} - \frac{(b(bc - ad)g^2) \int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{(c+dx)^2} dx}{1755904d^2} + \frac{(bc - ad)^2 g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{7023616d^3(c + dx)^2} \\
&= -\frac{(bc - ad)^2 g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{7023616d^3(c + dx)^2} + \frac{b(bc - ad)g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{1755904d^3(c + dx)} \\
&= -\frac{(bc - ad)^2 g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{7023616d^3(c + dx)^2} + \frac{b(bc - ad)g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{1755904d^3(c + dx)} \\
&= -\frac{(bc - ad)^2 g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{7023616d^3(c + dx)^2} + \frac{b(bc - ad)g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{1755904d^3(c + dx)} \\
&= \frac{B(bc - ad)^2 g^2 n}{14047232d^3(c + dx)^2} - \frac{3bB(bc - ad)g^2 n}{7023616d^3(c + dx)} - \frac{3b^2 Bg^2 n \log(a + bx)}{7023616d^3} - \frac{(bc - ad)^2 g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{7023616d^3(c + dx)} \\
&= \frac{B(bc - ad)^2 g^2 n}{14047232d^3(c + dx)^2} - \frac{3bB(bc - ad)g^2 n}{7023616d^3(c + dx)} - \frac{3b^2 Bg^2 n \log(a + bx)}{7023616d^3} - \frac{(bc - ad)^2 g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{7023616d^3(c + dx)} \\
&= \frac{B(bc - ad)^2 g^2 n}{14047232d^3(c + dx)^2} - \frac{3bB(bc - ad)g^2 n}{7023616d^3(c + dx)} - \frac{3b^2 Bg^2 n \log(a + bx)}{7023616d^3} - \frac{(bc - ad)^2 g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{7023616d^3(c + dx)}
\end{aligned}$$

**Mathematica [A]** time = 0.355202, size = 259, normalized size = 0.98

$$g^2 \left( -2b^2 Bn \left( 2 \text{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right) + \log(c + dx) \left( 2 \log \left( \frac{d(a+bx)}{ad-bc} \right) - \log(c + dx) \right) \right) + 4b^2 \log(c + dx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) \right)$$

Antiderivative was successfully verified.

[In] Integrate[((a\*g + b\*g\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(c\*i + d\*i\*x)^3,x]

[Out] (g^2\*((B\*(b\*c - a\*d)^2\*n)/(c + d\*x)^2 - (6\*b\*B\*(b\*c - a\*d)\*n)/(c + d\*x) - 6\*b^2\*B\*n\*Log[a + b\*x] - (2\*(b\*c - a\*d)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))

$$\frac{\left(\frac{b^2 x^2 + (8b^2 c - a^2 d) \log\left(\frac{e^{(a+bx)/(c+dx)^n}}{(c+dx)^n}\right) + 6b^2 B^n \log[c+dx] + 4b^2 (A + B \log\left(\frac{e^{(a+bx)/(c+dx)^n}\right) \log[c+dx] - 2b^2 B^n \left(\frac{2 \log\left(\frac{d(a+bx)}{-(bc)+ad}\right) - \log[c+dx]}{\log[c+dx]}\right) + 2 \text{PolyLog}\left[2, \frac{b(c+dx)}{bc-ad}\right]\right)}{(4d^3 i^3)}\right)}{(c+dx)^2 + (8b^2 c - a^2 d) \log\left(\frac{e^{(a+bx)/(c+dx)^n}}{(c+dx)^n}\right) + 6b^2 B^n \log[c+dx] + 4b^2 (A + B \log\left(\frac{e^{(a+bx)/(c+dx)^n}\right) \log[c+dx] - 2b^2 B^n \left(\frac{2 \log\left(\frac{d(a+bx)}{-(bc)+ad}\right) - \log[c+dx]}{\log[c+dx]}\right) + 2 \text{PolyLog}\left[2, \frac{b(c+dx)}{bc-ad}\right]\right)}{(4d^3 i^3)}$$

**Maple [F]** time = 0.68, size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^2}{(dix + ci)^3} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)^3,x)

[Out] int((b\*g\*x+a\*g)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)^3,x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)^3,x, algorithm="maxima")

[Out]  $\frac{1}{2} B a b g^2 n \left( \frac{(b^2 c^2 - 3 a^2 c d + 2 (b^2 c d - 2 a^2 d^2) x)}{(b^2 c d^4 - a^2 d^5) i^3 x^2 + 2 (b^2 c^2 d^3 - a^2 c d^4) i^3 x + (b^2 c^3 d^2 - a^2 c^2 d^3) i^3} + \frac{2 (b^2 c - 2 a b d) \log(bx + a)}{(b^2 c^2 d^2 - 2 a b c d^3 + a^2 d^4) i^3} - \frac{2 (b^2 c - 2 a b d) \log(dx + c)}{(b^2 c^2 d^2 - 2 a b c d^3 + a^2 d^4) i^3} \right) + \frac{1}{4} B a^2 g^2 n \left( \frac{(2 b^2 d x + 3 b^2 c - a^2 d)}{(b^2 c d^3 - a^2 d^4) i^3 x^2 + 2 (b^2 c^2 d^2 - a^2 c d^3) i^3 x + (b^2 c^3 d - a^2 c^2 d^2) i^3} + \frac{2 b^2 \log(bx + a)}{(b^2 c^2 d - 2 a b c d^2 + a^2 d^3) i^3} - \frac{2 b^2 \log(dx + c)}{(b^2 c^2 d - 2 a b c d^2 + a^2 d^3) i^3} \right) + \frac{1}{2} A b^2 g^2 \left( \frac{(4 c d x + 3 c^2)}{(d^5 i^3 x^2 + 2 c d^4 i^3 x + c^2 d^3 i^3) + 2 \log(dx + c) / (d^3 i^3)} \right) - \frac{1}{2} B b^2 g^2 \left( \frac{(2 (d^2 n x^2 + 2 c d n x + c^2 n) \log(bx + a) \log(dx + c) - (d^2 n x^2 + 2 c d n x + c^2 n) \log(dx + c)^2 - (4 c d x + 3 c^2 + 2 (d^2 x^2 + 2 c d x + c^2) \log(dx + c)) \log((bx + a)^n) + (4 c d x + 3 c^2 + 2 (d^2 x^2 + 2 c d x + c^2) \log(dx + c)) \log((dx + c)^n))}{(d^5 i^3 x^2 + 2 c d^4 i^3 x + c^2 d^3 i^3) + 2 \log(dx + c) / (d^3 i^3)} \right)$

$$2*c*d^4*i^3*x + c^2*d^3*i^3) - 2*\integrate(1/2*(2*b*d^3*x^3*\log(e) + 2*a*d^3*x^2*\log(e) - 3*b*c^3*n + 3*a*c^2*d*n - 4*(b*c^2*d*n - a*c*d^2*n)*x + 2*(b*d^3*n*x^3 + a*c^2*d*n + (2*b*c*d^2*n + a*d^3*n)*x^2 + (b*c^2*d*n + 2*a*c*d^2*n)*x)*\log(b*x + a))/(b*d^6*i^3*x^4 + a*c^3*d^3*i^3 + (3*b*c*d^5*i^3 + a*d^6*i^3)*x^3 + 3*(b*c^2*d^4*i^3 + a*c*d^5*i^3)*x^2 + (b*c^3*d^3*i^3 + 3*a*c^2*d^4*i^3)*x), x) - (2*d*x + c)*B*a*b*g^2*\log(e*(b*x/(d*x + c) + a/(d*x + c)))^n)/(d^4*i^3*x^2 + 2*c*d^3*i^3*x + c^2*d^2*i^3) - (2*d*x + c)*A*a*b*g^2/(d^4*i^3*x^2 + 2*c*d^3*i^3*x + c^2*d^2*i^3) - 1/2*B*a^2*g^2*\log(e*(b*x/(d*x + c) + a/(d*x + c)))^n)/(d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3) - 1/2*A*a^2*g^2/(d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3)$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\int \left( \frac{Ab^2g^2x^2 + 2Aabg^2x + Aa^2g^2 + (Bb^2g^2x^2 + 2Babg^2x + Ba^2g^2) \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}{d^3i^3x^3 + 3cd^2i^3x^2 + 3c^2di^3x + c^3i^3}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)^3,x, algorithm="fricas")

[Out] integral((A\*b^2\*g^2\*x^2 + 2\*A\*a\*b\*g^2\*x + A\*a^2\*g^2 + (B\*b^2\*g^2\*x^2 + 2\*B\*a\*b\*g^2\*x + B\*a^2\*g^2)\*log(e\*((b\*x + a)/(d\*x + c))^n))/(d^3\*i^3\*x^3 + 3\*c\*d^2\*i^3\*x^2 + 3\*c^2\*d\*i^3\*x + c^3\*i^3), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*\*2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n))/(d\*i\*x+c\*i)\*\*3,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^2 \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)}{(dix + ci)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)/(d*i*x + c*i)^3, x)
```

$$3.153 \quad \int \frac{(ag+bgx)\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(ci+dx)^3} dx$$

**Optimal.** Leaf size=89

$$\frac{g(a+bx)^2\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2i^3(c+dx)^2(bc-ad)} - \frac{Bgn(a+bx)^2}{4i^3(c+dx)^2(bc-ad)}$$

[Out]  $-(B*g*n*(a+b*x)^2)/(4*(b*c-a*d)*i^3*(c+d*x)^2) + (g*(a+b*x)^2*(A+B*\text{Log}[e*((a+b*x)/(c+d*x))^n]))/(2*(b*c-a*d)*i^3*(c+d*x)^2)$

**Rubi [B]** time = 0.316962, antiderivative size = 201, normalized size of antiderivative = 2.26, number of steps used = 10, number of rules used = 4, integrand size = 41,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.098$ , Rules used = {2528, 2525, 12, 44}

$$-\frac{bg\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^2i^3(c+dx)} + \frac{g(bc-ad)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2d^2i^3(c+dx)^2} + \frac{b^2Bgn \log(a+bx)}{2d^2i^3(bc-ad)} - \frac{b^2Bgn \log(c+dx)}{2d^2i^3(bc-ad)} - \frac{Bgn(bc+dx)}{4d^2i^3(c+dx)}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[\left((a*g+b*g*x)*(A+B*\text{Log}[e*((a+b*x)/(c+d*x))^n])\right)/(c*i+d*i*x)^3, x]$

[Out]  $-(B*(b*c-a*d)*g*n)/(4*d^2*i^3*(c+d*x)^2) + (b*B*g*n)/(2*d^2*i^3*(c+d*x)) + (b^2*B*g*n*\text{Log}[a+b*x])/(2*d^2*(b*c-a*d)*i^3) + ((b*c-a*d)*g*(A+B*\text{Log}[e*((a+b*x)/(c+d*x))^n]))/(2*d^2*i^3*(c+d*x)^2) - (b*g*(A+B*\text{Log}[e*((a+b*x)/(c+d*x))^n]))/(d^2*i^3*(c+d*x)) - (b^2*B*g*n*\text{Log}[c+d*x])/(2*d^2*(b*c-a*d)*i^3)$

### Rule 2528

$\text{Int}[\left((a_.) + \text{Log}[(c_.)*(RFx_)^(p_.)]*(b_.)\right)^(n_.)*(RGx_), x\_Symbol] \rightarrow \text{With}[\{u = \text{ExpandIntegrand}[(a + b*\text{Log}[c*RFx^p])^n, RGx, x]\}, \text{Int}[u, x] /; \text{SumQ}[u]] /; \text{FreeQ}\{a, b, c, p, x\} \&\& \text{RationalFunctionQ}[RFx, x] \&\& \text{RationalFunctionQ}[RGx, x] \&\& \text{IGtQ}[n, 0]$

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_.))^(m_.)*((c_.) + (d_.)*(x_.))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

### Rubi steps

$$\begin{aligned}
 \int \frac{(ag + bgx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(153c + 153dx)^3} dx &= \int \left( \frac{(-bc + ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3581577d(c + dx)^3} + \frac{bg \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3581577d(c + dx)^2} \right) dx \\
 &= \frac{(bg) \int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{(c+dx)^2} dx}{3581577d} - \frac{((bc - ad)g) \int \frac{A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{(c+dx)^3} dx}{3581577d} \\
 &= \frac{(bc - ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{7163154d^2(c + dx)^2} - \frac{bg \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3581577d^2(c + dx)} + \frac{(bBgn) \int}{35} \\
 &= \frac{(bc - ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{7163154d^2(c + dx)^2} - \frac{bg \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3581577d^2(c + dx)} + \frac{(bB(bc - ad)gn)}{7163154d^2(c + dx)^2} \\
 &= \frac{(bc - ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{7163154d^2(c + dx)^2} - \frac{bg \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3581577d^2(c + dx)} + \frac{(bB(bc - ad)gn)}{7163154d^2(c + dx)^2} \\
 &= -\frac{B(bc - ad)gn}{14326308d^2(c + dx)^2} + \frac{bBgn}{7163154d^2(c + dx)} + \frac{b^2Bgn \log(a + bx)}{7163154d^2(bc - ad)} + \frac{(bc - ad)gn}{7163154d^2}
 \end{aligned}$$

**Mathematica [B]** time = 0.156385, size = 215, normalized size = 2.42

$$8 \left( \frac{b \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{d^2(c+dx)} + \frac{(bc-ad) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{2d^2(c+dx)^2} - \frac{Bn \left( \frac{2b^2 \log(a+bx)}{bc-ad} - \frac{2b^2 \log(c+dx)}{bc-ad} + \frac{bc-ad}{(c+dx)^2} + \frac{2b}{c+dx} \right)}{4d^2} + \frac{bBn \left( \frac{b \log(a+bx)}{bc-ad} - \frac{b \log(c+dx)}{bc-ad} + \frac{1}{c+dx} \right)}{d^2} \right) \frac{1}{i^3}$$

Antiderivative was successfully verified.

[In] Integrate[((a\*g + b\*g\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(c\*i + d\*i\*x)^3,x]

[Out] (g\*(((b\*c - a\*d)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(2\*d^2\*(c + d\*x)^2) - (b\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(d^2\*(c + d\*x)) + (b\*B\*n\*((c + d\*x)^(-1) + (b\*Log[a + b\*x])/(b\*c - a\*d) - (b\*Log[c + d\*x])/(b\*c - a\*d)))/d^2 - (B\*n\*((b\*c - a\*d)/(c + d\*x)^2 + (2\*b)/(c + d\*x) + (2\*b^2\*Log[a + b\*x])/(b\*c - a\*d) - (2\*b^2\*Log[c + d\*x])/(b\*c - a\*d)))/(4\*d^2))/i^3

**Maple [F]** time = 0.521, size = 0, normalized size = 0.

$$\int \frac{bgx + ag}{(dix + ci)^3} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)^3,x)

[Out] int((b\*g\*x+a\*g)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)^3,x)

**Maxima [B]** time = 1.25808, size = 780, normalized size = 8.76

$$\frac{1}{4} B b g n \left( \frac{bc^2 - 3acd + 2(bcd - 2ad^2)x}{(bcd^4 - ad^5)i^3x^2 + 2(bc^2d^3 - acd^4)i^3x + (bc^3d^2 - ac^2d^3)i^3} + \frac{2(b^2c - 2abd) \log(bx + a)}{(b^2c^2d^2 - 2abcd^3 + a^2d^4)i^3} - \frac{2(b^2c - 2abd) \log}{(b^2c^2d^2 - 2abcd^3 -$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)^3,x, algorithm="maxima")

```
[Out] 1/4*B*b*g*n*((b*c^2 - 3*a*c*d + 2*(b*c*d - 2*a*d^2)*x)/((b*c*d^4 - a*d^5)*i
^3*x^2 + 2*(b*c^2*d^3 - a*c*d^4)*i^3*x + (b*c^3*d^2 - a*c^2*d^3)*i^3) + 2*(
b^2*c - 2*a*b*d)*log(b*x + a)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*i^3) -
2*(b^2*c - 2*a*b*d)*log(d*x + c)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*i^
3)) + 1/4*B*a*g*n*((2*b*d*x + 3*b*c - a*d)/((b*c*d^3 - a*d^4)*i^3*x^2 + 2*(
b*c^2*d^2 - a*c*d^3)*i^3*x + (b*c^3*d - a*c^2*d^2)*i^3) + 2*b^2*log(b*x + a
)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3) - 2*b^2*log(d*x + c)/((b^2*c^2*
d - 2*a*b*c*d^2 + a^2*d^3)*i^3)) - 1/2*(2*d*x + c)*B*b*g*log(e*(b*x/(d*x +
c) + a/(d*x + c))^n)/(d^4*i^3*x^2 + 2*c*d^3*i^3*x + c^2*d^2*i^3) - 1/2*(2*d
*x + c)*A*b*g/(d^4*i^3*x^2 + 2*c*d^3*i^3*x + c^2*d^2*i^3) - 1/2*B*a*g*log(e
*(b*x/(d*x + c) + a/(d*x + c))^n)/(d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3)
- 1/2*A*a*g/(d^3*i^3*x^2 + 2*c*d^2*i^3*x + c^2*d*i^3)
```

**Fricas [B]** time = 0.534184, size = 509, normalized size = 5.72

$$\frac{(Bb^2c^2 - Ba^2d^2)gn - 2(Ab^2c^2 - Aa^2d^2)g + 2((Bb^2cd - Babd^2)gn - 2(Ab^2cd - Aabd^2)g)x - 2(2(Bb^2cd - Babd^2)gx + 4((bcd^4 - ad^5)i^3x^2 + 2(bc^2d^3 - acd^4)i^3x + (bc^3d^2 -$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)^3,x, alg
orithm="fricas")
```

```
[Out] 1/4*((B*b^2*c^2 - B*a^2*d^2)*g*n - 2*(A*b^2*c^2 - A*a^2*d^2)*g + 2*((B*b^2*
c*d - B*a*b*d^2)*g*n - 2*(A*b^2*c*d - A*a*b*d^2)*g)*x - 2*(2*(B*b^2*c*d - B
*a*b*d^2)*g*x + (B*b^2*c^2 - B*a^2*d^2)*g)*log(e) + 2*(B*b^2*d^2*g*n*x^2 +
2*B*a*b*d^2*g*n*x + B*a^2*d^2*g*n)*log((b*x + a)/(d*x + c))/((b*c*d^4 - a*
d^5)*i^3*x^2 + 2*(b*c^2*d^3 - a*c*d^4)*i^3*x + (b*c^3*d^2 - a*c^2*d^3)*i^3)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```



---

**Giac [B]** time = 1.25183, size = 298, normalized size = 3.35

$$-\frac{Bb^2gn \log(bx + a)}{2(bcd^{2i} - ad^{3i})} + \frac{Bb^2gn \log(dx + c)}{2(bcd^{2i} - ad^{3i})} - \frac{(2Bbdginx + Bbcgin + Badgin) \log\left(\frac{bx+a}{dx+c}\right)}{2(d^4x^2 + 2cd^3x + c^2d^2)} + \frac{2Bbdginx + Bbcgin + Badgin}{2(d^4x^2 + 2cd^3x + c^2d^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)^3,x, algorithm="giac")

[Out] 
$$-1/2*B*b^2*g*n*\log(b*x + a)/(b*c*d^2*i - a*d^3*i) + 1/2*B*b^2*g*n*\log(d*x + c)/(b*c*d^2*i - a*d^3*i) - 1/2*(2*B*b*d*g*i*n*x + B*b*c*g*i*n + B*a*d*g*i*n)*\log((b*x + a)/(d*x + c))/(d^4*x^2 + 2*c*d^3*x + c^2*d^2) + 1/4*(2*B*b*d*g*i*n*x + B*b*c*g*i*n + B*a*d*g*i*n - 4*A*b*d*g*i*x - 4*B*b*d*g*i*x - 2*A*b*c*g*i - 2*B*b*c*g*i - 2*A*a*d*g*i - 2*B*a*d*g*i)/(d^4*x^2 + 2*c*d^3*x + c^2*d^2)$$

$$3.154 \quad \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ci+dx)^3} dx$$

**Optimal.** Leaf size=151

$$-\frac{B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A}{2di^3(c+dx)^2} + \frac{b^2Bn \log(a+bx)}{2di^3(bc-ad)^2} - \frac{b^2Bn \log(c+dx)}{2di^3(bc-ad)^2} + \frac{bBn}{2di^3(c+dx)(bc-ad)} + \frac{Bn}{4di^3(c+dx)^2}$$

[Out] (B\*n)/(4\*d\*i^3\*(c + d\*x)^2) + (b\*B\*n)/(2\*d\*(b\*c - a\*d)\*i^3\*(c + d\*x)) + (b^2\*B\*n\*Log[a + b\*x])/(2\*d\*(b\*c - a\*d)^2\*i^3) - (A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])/(2\*d\*i^3\*(c + d\*x)^2) - (b^2\*B\*n\*Log[c + d\*x])/(2\*d\*(b\*c - a\*d)^2\*i^3)

**Rubi [A]** time = 0.104282, antiderivative size = 151, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 33,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$ , Rules used = {2525, 12, 44}

$$-\frac{B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A}{2di^3(c+dx)^2} + \frac{b^2Bn \log(a+bx)}{2di^3(bc-ad)^2} - \frac{b^2Bn \log(c+dx)}{2di^3(bc-ad)^2} + \frac{bBn}{2di^3(c+dx)(bc-ad)} + \frac{Bn}{4di^3(c+dx)^2}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])/(c\*i + d\*i\*x)^3,x]

[Out] (B\*n)/(4\*d\*i^3\*(c + d\*x)^2) + (b\*B\*n)/(2\*d\*(b\*c - a\*d)\*i^3\*(c + d\*x)) + (b^2\*B\*n\*Log[a + b\*x])/(2\*d\*(b\*c - a\*d)^2\*i^3) - (A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])/(2\*d\*i^3\*(c + d\*x)^2) - (b^2\*B\*n\*Log[c + d\*x])/(2\*d\*(b\*c - a\*d)^2\*i^3)

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^n]*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

Int[(a\_)\*(u\_), x\_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b\_)\*(v\_) /; FreeQ[b, x]]

Rule 44

Int[((a\_) + (b\_)\*(x\_))^(m\_)\*((c\_) + (d\_)\*(x\_))^(n\_), x\_Symbol] := Int[ExpandIntegrand[(a + b\*x)^m\*(c + d\*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b\*c - a\*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])

Rubi steps

$$\begin{aligned} \int \frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(154c + 154dx)^3} dx &= -\frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{7304528d(c + dx)^2} + \frac{(Bn) \int \frac{bc-ad}{23716(a+bx)(c+dx)^3} dx}{308d} \\ &= -\frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{7304528d(c + dx)^2} + \frac{(B(bc - ad)n) \int \frac{1}{(a+bx)(c+dx)^3} dx}{7304528d} \\ &= -\frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{7304528d(c + dx)^2} + \frac{(B(bc - ad)n) \int \left(\frac{b^3}{(bc-ad)^3(a+bx)} - \frac{d}{(bc-ad)(c+dx)^3} - \frac{bd}{(bc-ad)^2(c+dx)^2}\right) dx}{7304528d} \\ &= \frac{Bn}{14609056d(c + dx)^2} + \frac{bBn}{7304528d(bc - ad)(c + dx)} + \frac{b^2Bn \log(a + bx)}{7304528d(bc - ad)^2} - \frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{7304528d} \end{aligned}$$

**Mathematica [A]** time = 0.132717, size = 115, normalized size = 0.76

$$\frac{\frac{Bn(2b^2(c+dx)^2 \log(a+bx) + (bc-ad)(-ad+3bc+2bdx) - 2b^2(c+dx)^2 \log(c+dx))}{(bc-ad)^2} - 2\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{4di^3(c + dx)^2}$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])/(c\*i + d\*i\*x)^3,x]

[Out] (-2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + (B\*n\*((b\*c - a\*d)\*(3\*b\*c - a\*d + 2\*b\*d\*x) + 2\*b^2\*(c + d\*x)^2\*Log[a + b\*x] - 2\*b^2\*(c + d\*x)^2\*Log[c + d\*x]))/(b\*c - a\*d)^2/(4\*d\*i^3\*(c + d\*x)^2)

---

**Maple [F]** time = 0.538, size = 0, normalized size = 0.

$$\int \frac{1}{(dix + ci)^3} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)^3,x)

[Out] int((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)^3,x)

---

**Maxima [A]** time = 1.20476, size = 350, normalized size = 2.32

$$\frac{1}{4} B n \left( \frac{2 b d x + 3 b c - a d}{(b c d^3 - a d^4) i^3 x^2 + 2 (b c^2 d^2 - a c d^3) i^3 x + (b c^3 d - a c^2 d^2) i^3} + \frac{2 b^2 \log (b x + a)}{(b^2 c^2 d - 2 a b c d^2 + a^2 d^3) i^3} - \frac{2 b^2 \log (d x + c)}{(b^2 c^2 d - 2 a b c d^2 + a^2 d^3) i^3} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)^3,x, algorithm="maxima")

[Out] 1/4\*B\*n\*((2\*b\*d\*x + 3\*b\*c - a\*d)/((b\*c\*d^3 - a\*d^4)\*i^3\*x^2 + 2\*(b\*c^2\*d^2 - a\*c\*d^3)\*i^3\*x + (b\*c^3\*d - a\*c^2\*d^2)\*i^3) + 2\*b^2\*log(b\*x + a)/((b^2\*c^2\*d - 2\*a\*b\*c\*d^2 + a^2\*d^3)\*i^3) - 2\*b^2\*log(d\*x + c)/((b^2\*c^2\*d - 2\*a\*b\*c\*d^2 + a^2\*d^3)\*i^3) - 1/2\*B\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n)/(d^3\*i^3\*x^2 + 2\*c\*d^2\*i^3\*x + c^2\*d\*i^3) - 1/2\*A/(d^3\*i^3\*x^2 + 2\*c\*d^2\*i^3\*x + c^2\*d\*i^3)

---

**Fricas [A]** time = 0.524769, size = 562, normalized size = 3.72

$$\frac{2 A b^2 c^2 - 4 A a b c d + 2 A a^2 d^2 - 2 (B b^2 c d - B a b d^2) n x - (3 B b^2 c^2 - 4 B a b c d + B a^2 d^2) n + 2 (B b^2 c^2 - 2 B a b c d + B a^2 d^2) \log \left( \frac{b x + a}{d x + c} \right)}{4 \left( (b^2 c^2 d^3 - 2 a b c d^4 + a^2 d^5) i^3 x^2 + 2 (b^2 c^3 d^2 - 2 a b c^2 d^3 + a^2 c d^4) i^3 x + (b^2 c^4 d - 2 a b c^3 d^2 + a^2 c^2 d^3) i^3 \right)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)^3,x, algorithm="fricas")

[Out] 
$$-1/4*(2*A*b^2*c^2 - 4*A*a*b*c*d + 2*A*a^2*d^2 - 2*(B*b^2*c*d - B*a*b*d^2))*n*x - (3*B*b^2*c^2 - 4*B*a*b*c*d + B*a^2*d^2)*n + 2*(B*b^2*c^2 - 2*B*a*b*c*d + B*a^2*d^2)*\log(e) - 2*(B*b^2*d^2*n*x^2 + 2*B*b^2*c*d*n*x + (2*B*a*b*c*d - B*a^2*d^2)*n)*\log((b*x + a)/(d*x + c)) / ((b^2*c^2*d^3 - 2*a*b*c*d^4 + a^2*d^5)*i^3*x^2 + 2*(b^2*c^3*d^2 - 2*a*b*c^2*d^3 + a^2*c*d^4)*i^3*x + (b^2*c^4*d - 2*a*b*c^3*d^2 + a^2*c^2*d^3)*i^3)$$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)\*\*3,x)

[Out] Timed out

**Giac [A]** time = 1.30498, size = 309, normalized size = 2.05

$$-\frac{Bb^2n \log(bx + a)}{2(b^2c^2di - 2abcd^2i + a^2d^3i)} + \frac{Bb^2n \log(dx + c)}{2(b^2c^2di - 2abcd^2i + a^2d^3i)} - \frac{Bin \log\left(\frac{bx+a}{dx+c}\right)}{2(d^3x^2 + 2cd^2x + c^2d)} + \frac{2Bbdinx + 3Bbcin - Badin}{4(bcd^3x^2 - ad^4x^2 + 2bcd^2x + c^2d)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(d\*i\*x+c\*i)^3,x, algorithm="giac")

[Out] 
$$-1/2*B*b^2*n*\log(b*x + a)/(b^2*c^2*d*i - 2*a*b*c*d^2*i + a^2*d^3*i) + 1/2*B*b^2*n*\log(d*x + c)/(b^2*c^2*d*i - 2*a*b*c*d^2*i + a^2*d^3*i) - 1/2*B*i*n*\log((b*x + a)/(d*x + c))/(d^3*x^2 + 2*c*d^2*x + c^2*d) + 1/4*(2*B*b*d*i*n*x + 3*B*b*c*i*n - B*a*d*i*n - 2*A*b*c*i - 2*B*b*c*i + 2*A*a*d*i + 2*B*a*d*i)/(b*c*d^3*x^2 - a*d^4*x^2 + 2*b*c^2*d^2*x - 2*a*c*d^3*x + b*c^3*d - a*c^2*d^2)$$

$$3.155 \quad \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)(ci+dix)^3} dx$$

**Optimal.** Leaf size=254

$$\frac{b^2 \log\left(\frac{a+bx}{c+dx}\right) \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{gi^3(bc-ad)^3} + \frac{d^2(a+bx)^2 \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{2gi^3(c+dx)^2(bc-ad)^3} - \frac{2bd(a+bx) \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{gi^3(c+dx)(bc-ad)^3} - \frac{b^2 \log(c+dx) \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{gi^3(bc-ad)^3}$$

[Out]  $-(B*n*(4*b - (d*(a + b*x))/(c + d*x))^2)/(4*(b*c - a*d)^3*g*i^3) + (d^2*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^3*g*i^3*(c + d*x)^2) - (2*b*d*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^3*g*i^3*(c + d*x)) + (b^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(a + b*x)/(c + d*x)])/((b*c - a*d)^3*g*i^3) - (b^2*B*n*Log[(a + b*x)/(c + d*x)]^2)/(2*(b*c - a*d)^3*g*i^3)$

**Rubi [C]** time = 0.868867, antiderivative size = 557, normalized size of antiderivative = 2.19, number of steps used = 26, number of rules used = 11, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.256$ , Rules used = {2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 12, 44}

$$\frac{b^2 B n \text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{gi^3(bc-ad)^3} + \frac{b^2 B n \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{gi^3(bc-ad)^3} + \frac{b^2 \log(a+bx) \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{gi^3(bc-ad)^3} - \frac{b^2 \log(c+dx) \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{gi^3(bc-ad)^3}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]]/((a*g + b*g*x)*(c*i + d*i*x)^3), x]$

[Out]  $-(B*n)/(4*(b*c - a*d)*g*i^3*(c + d*x)^2) - (3*b^2*B*n*Log[a + b*x])/(2*(b*c - a*d)^2*g*i^3*(c + d*x)) - (3*b^2*B*n*Log[a + b*x])/(2*(b*c - a*d)^3*g*i^3) - (b^2*B*n*Log[a + b*x]^2)/(2*(b*c - a*d)^3*g*i^3) + (A + B*Log[e*((a + b*x)/(c + d*x))^n])/(2*(b*c - a*d)*g*i^3*(c + d*x)^2) + (b*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^2*g*i^3*(c + d*x)) + (b^2*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^3*g*i^3) + (3*b^2*B*n*Log[c + d*x])/(2*(b*c - a*d)^3*g*i^3) + (b^2*B*n*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)^3*g*i^3) - (b^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/((b*c - a*d)^3*g*i^3) - (b^2*B*n*Log[c + d*x]^2)/(2*(b*c - a*d)^3*g*i^3) + (b^2*B*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)]/((b*c - a*d)^3*g*i^3) + (b^2*B*n*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^3*g*i^3) + (b^2*B*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]/((b*c - a$

\*d)^3\*g\*i^3)

### Rule 2528

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*(RGx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

### Rule 2524

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^n)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

### Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*(RFx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]

### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.)\*(x\_))^(q\_.), x\_Symbol] := Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] := Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

### Rubi steps



$$\begin{aligned}
\int \frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(155c + 155dx)^3(ag + bgx)} dx &= \int \left( \frac{b^3 \left( A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) \right)}{3723875(bc - ad)^3g(a + bx)} - \frac{d \left( A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) \right)}{3723875(bc - ad)g(c + dx)^3} - \frac{bd \left( A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) \right)}{3723875(bc - ad)^2g} \right) dx \\
&= \frac{b^3 \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx} dx}{3723875(bc - ad)^3g} - \frac{(b^2d) \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx} dx}{3723875(bc - ad)^3g} - \frac{(bd) \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(c+dx)^2} dx}{3723875(bc - ad)^2g} \\
&= \frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{7447750(bc - ad)g(c + dx)^2} + \frac{b \left( A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) \right)}{3723875(bc - ad)^2g(c + dx)} + \frac{b^2 \log(a + bx) \left( A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) \right)}{3723875(bc - ad)^2g} \\
&= \frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{7447750(bc - ad)g(c + dx)^2} + \frac{b \left( A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) \right)}{3723875(bc - ad)^2g(c + dx)} + \frac{b^2 \log(a + bx) \left( A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) \right)}{3723875(bc - ad)^2g} \\
&= \frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{7447750(bc - ad)g(c + dx)^2} + \frac{b \left( A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) \right)}{3723875(bc - ad)^2g(c + dx)} + \frac{b^2 \log(a + bx) \left( A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) \right)}{3723875(bc - ad)^2g} \\
&= -\frac{Bn}{14895500(bc - ad)g(c + dx)^2} - \frac{3bBn}{7447750(bc - ad)^2g(c + dx)} - \frac{3b^2Bn \log(a + bx)}{7447750(bc - ad)^3g} \\
&= -\frac{Bn}{14895500(bc - ad)g(c + dx)^2} - \frac{3bBn}{7447750(bc - ad)^2g(c + dx)} - \frac{3b^2Bn \log(a + bx)}{7447750(bc - ad)^3g} \\
&= -\frac{Bn}{14895500(bc - ad)g(c + dx)^2} - \frac{3bBn}{7447750(bc - ad)^2g(c + dx)} - \frac{3b^2Bn \log(a + bx)}{7447750(bc - ad)^3g}
\end{aligned}$$

**Mathematica [C]** time = 0.389916, size = 434, normalized size = 1.71

$$-2b^2Bn(c + dx)^2 \left( \log(a + bx) \left( \log(a + bx) - 2 \log\left(\frac{b(c+dx)}{bc-ad}\right) \right) - 2 \text{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) \right) + 2b^2Bn(c + dx)^2 \left( 2 \text{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) \right)$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])/((a\*g + b\*g\*x)\*(c\*i + d\*i\*x)^3), x]

[Out] (2\*(b\*c - a\*d)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 4\*b\*(b\*c - a\*d)\*(c + d\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 4\*b^2\*(c + d\*x)^2\*Log[a +

$$b*x]*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]) - 4*b^2*(c + d*x)^2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])* \text{Log}[c + d*x] - 4*b*B*n*(c + d*x)*(b*c - a*d + b*(c + d*x)*\text{Log}[a + b*x] - b*(c + d*x)*\text{Log}[c + d*x]) - B*n*((b*c - a*d)^2 + 2*b*(b*c - a*d)*(c + d*x) + 2*b^2*(c + d*x)^2*\text{Log}[a + b*x] - 2*b^2*(c + d*x)^2*\text{Log}[c + d*x]) - 2*b^2*B*n*(c + d*x)^2*(\text{Log}[a + b*x]*(\text{Log}[a + b*x] - 2*\text{Log}[(b*(c + d*x))/(b*c - a*d)]) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*b^2*B*n*(c + d*x)^2*((2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] - \text{Log}[c + d*x])* \text{Log}[c + d*x] + 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])))/(4*(b*c - a*d)^3*g*i^3*(c + d*x)^2)$$

**Maple [F]** time = 0.75, size = 0, normalized size = 0.

$$\int \frac{1}{(bgx + ag)(dix + ci)^3} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)/(d\*i\*x+c\*i)^3,x)

[Out] int((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)/(d\*i\*x+c\*i)^3,x)

**Maxima [B]** time = 1.42133, size = 1199, normalized size = 4.72

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)/(d\*i\*x+c\*i)^3,x, algorithm="maxima")

[Out]  $\frac{1}{2}B*((2*b*d*x + 3*b*c - a*d)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*g*i^3*x^2 + 2*(b^2*c^3*d - 2*a*b*c^2*d^2 + a^2*c*d^3)*g*i^3*x + (b^2*c^4 - 2*a*b*c^3*d + a^2*c^2*d^2)*g*i^3) + 2*b^2*\text{log}(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g*i^3) - 2*b^2*\text{log}(d*x + c)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g*i^3))*\text{log}(e*(b*x/(d*x + c) + a/(d*x + c))^n) - \frac{1}{4}*(7*b^2*c^2 - 8*a*b*c*d + a^2*d^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*\text{log}(b*x + a)^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*\text{log}(d*x + c)^2 + 6*(b^2*c*d - a*b*d^2)*x + 6*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*\text{log}(b*x + a) - 2*(3*b^2*d^2*x^2 + 6*b^2*c*d*x + 3*b^2*c^2 + 2*(b^2*d^2*x^2$

$$2 + 2*b^2*c*d*x + b^2*c^2)*\log(b*x + a))*\log(d*x + c))*B^n/(b^3*c^5*g*i^3 - 3*a*b^2*c^4*d*g*i^3 + 3*a^2*b*c^3*d^2*g*i^3 - a^3*c^2*d^3*g*i^3 + (b^3*c^3*d^2*g*i^3 - 3*a*b^2*c^2*d^3*g*i^3 + 3*a^2*b*c^2*d^3*g*i^3 - a^3*c*d^4*g*i^3)*x^2 + 2*(b^3*c^4*d*g*i^3 - 3*a*b^2*c^3*d^2*g*i^3 + 3*a^2*b*c^2*d^3*g*i^3 - a^3*c*d^4*g*i^3)*x) + 1/2*A*((2*b*d*x + 3*b*c - a*d)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*g*i^3*x^2 + 2*(b^2*c^3*d - 2*a*b*c^2*d^2 + a^2*c*d^3)*g*i^3*x + (b^2*c^4 - 2*a*b*c^3*d + a^2*c^2*d^2)*g*i^3) + 2*b^2*\log(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g*i^3) - 2*b^2*\log(d*x + c)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g*i^3))$$

**Fricas [A]** time = 0.555237, size = 1022, normalized size = 4.02

$$6Ab^2c^2 - 8Aabcd + 2Aa^2d^2 + 2(Bb^2d^2nx^2 + 2Bb^2cdnx + Bb^2c^2n)\log\left(\frac{bx+a}{dx+c}\right)^2 - (7Bb^2c^2 - 8Babcd + Ba^2d^2)n + 2(2$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)/(d\*i\*x+c\*i)^3,x, algorithm="fricas")

[Out] 1/4\*(6\*A\*b^2\*c^2 - 8\*A\*a\*b\*c\*d + 2\*A\*a^2\*d^2 + 2\*(B\*b^2\*d^2\*n\*x^2 + 2\*B\*b^2\*c\*d\*n\*x + B\*b^2\*c^2\*n)\*log((b\*x + a)/(d\*x + c))^2 - (7\*B\*b^2\*c^2 - 8\*B\*a\*b\*c\*d + B\*a^2\*d^2)\*n + 2\*(2\*A\*b^2\*c\*d - 2\*A\*a\*b\*d^2 - 3\*(B\*b^2\*c\*d - B\*a\*b\*d^2)\*n)\*x + 2\*(3\*B\*b^2\*c^2 - 4\*B\*a\*b\*c\*d + B\*a^2\*d^2 + 2\*(B\*b^2\*c\*d - B\*a\*b\*d^2)\*x + 2\*(B\*b^2\*d^2\*x^2 + 2\*B\*b^2\*c\*d\*x + B\*b^2\*c^2)\*log((b\*x + a)/(d\*x + c)))\*log(e) + 2\*(2\*A\*b^2\*c^2 - (3\*B\*b^2\*d^2\*n - 2\*A\*b^2\*d^2)\*x^2 - (4\*B\*a\*b\*c\*d - B\*a^2\*d^2)\*n + 2\*(2\*A\*b^2\*c\*d - (2\*B\*b^2\*c\*d + B\*a\*b\*d^2)\*n)\*x)\*log((b\*x + a)/(d\*x + c)))/((b^3\*c^3\*d^2 - 3\*a\*b^2\*c^2\*d^3 + 3\*a^2\*b\*c\*d^4 - a^3\*d^5)\*g\*i^3\*x^2 + 2\*(b^3\*c^4\*d - 3\*a\*b^2\*c^3\*d^2 + 3\*a^2\*b\*c^2\*d^3 - a^3\*c\*d^4)\*g\*i^3\*x + (b^3\*c^5 - 3\*a\*b^2\*c^4\*d + 3\*a^2\*b\*c^3\*d^2 - a^3\*c^2\*d^3)\*g\*i^3)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)/(d\*i\*x+c\*i)\*\*3,x)

[Out] Timed out

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{B \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A}{(bgx+ag)(dix+ci)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)/(d\*i\*x+c\*i)^3,x, algorithm="giac")

[Out] integrate((B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)/((b\*g\*x + a\*g)\*(d\*i\*x + c\*i)^3), x)

$$3.156 \quad \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^2(ci+dix)^3} dx$$

**Optimal.** Leaf size=381

$$\frac{b^3(c+dx)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i^3(a+bx)(bc-ad)^4} - \frac{3b^2d \log\left(\frac{a+bx}{c+dx}\right)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i^3(bc-ad)^4} + \frac{3bd^2(a+bx)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i^3(c+dx)(bc-ad)^4}$$

[Out]  $(B*d^3*n*(a+b*x)^2)/(4*(b*c-a*d)^4*g^2*i^3*(c+d*x)^2) - (3*b*B*d^2*n*(a+b*x))/((b*c-a*d)^4*g^2*i^3*(c+d*x)) - (b^3*B*n*(c+d*x))/((b*c-a*d)^4*g^2*i^3*(a+b*x)) - (d^3*(a+b*x)^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(2*(b*c-a*d)^4*g^2*i^3*(c+d*x)^2) + (3*b*d^2*(a+b*x)*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/((b*c-a*d)^4*g^2*i^3*(c+d*x)) - (b^3*(c+d*x)*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/((b*c-a*d)^4*g^2*i^3*(a+b*x)) - (3*b^2*d*(A+B*Log[e*((a+b*x)/(c+d*x))^n])*Log[(a+b*x)/(c+d*x)])/((b*c-a*d)^4*g^2*i^3) + (3*b^2*B*d*n*Log[(a+b*x)/(c+d*x)]^2)/(2*(b*c-a*d)^4*g^2*i^3)$

**Rubi [C]** time = 1.08323, antiderivative size = 657, normalized size of antiderivative = 1.72, number of steps used = 30, number of rules used = 11, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.256$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{3b^2Bdn \text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{g^2i^3(bc-ad)^4} - \frac{3b^2Bdn \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{g^2i^3(bc-ad)^4} - \frac{3b^2d \log(a+bx)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i^3(bc-ad)^4} - \frac{b^2\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2i^3(a+bx)}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])/((a\*g + b\*g\*x)^2\*(c\*i + d\*i\*x)^3), x]

[Out]  $-((b^2*B*n)/((b*c-a*d)^3*g^2*i^3*(a+b*x))) + (B*d*n)/(4*(b*c-a*d)^2*g^2*i^3*(c+d*x)^2) + (5*b*B*d*n)/(2*(b*c-a*d)^3*g^2*i^3*(c+d*x)) + (3*b^2*B*d*n*Log[a+b*x])/((b*c-a*d)^4*g^2*i^3) + (3*b^2*B*d*n*Log[a+b*x]^2)/(2*(b*c-a*d)^4*g^2*i^3) - (b^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/((b*c-a*d)^3*g^2*i^3*(a+b*x)) - (d*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/((b*c-a*d)^2*g^2*i^3*(c+d*x)^2) - (2*b*d*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/((b*c-a*d)^3*g^2*i^3*(c+d*x)) - (3*b^2*d*Log[a+b*x]*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/((b*c-a*d)^4*g^2*i^3) - (3*b^2*B*d*n*Log[c+d*x])/((b*c-a*d)^4*g^2*i^3) - (3*b^2*B*d*n*Log[-((d*(a+b*x)/(c+d*x))^n]])/((b*c-a*d)^4*g^2*i^3)$

$$\frac{b*x)}{(b*c - a*d)}] * \text{Log}[c + d*x] / ((b*c - a*d)^4 * g^{2*i^3}) + (3*b^2*d*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]) * \text{Log}[c + d*x] / ((b*c - a*d)^4 * g^{2*i^3}) + (3*b^2*B*d*n*\text{Log}[c + d*x]^2) / (2*(b*c - a*d)^4 * g^{2*i^3}) - (3*b^2*B*d*n*\text{Log}[a + b*x] * \text{Log}[(b*(c + d*x))/(b*c - a*d)]) / ((b*c - a*d)^4 * g^{2*i^3}) - (3*b^2*B*d*n*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]) / ((b*c - a*d)^4 * g^{2*i^3}) - (3*b^2*B*d*n*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]) / ((b*c - a*d)^4 * g^{2*i^3})$$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]
] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e^n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))])*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rubi steps

$$\begin{aligned}
\int \frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(156c + 156dx)^3(ag + bgx)^2} dx &= \int \left( \frac{b^3 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3796416(bc - ad)^3 g^2 (a + bx)^2} - \frac{b^3 d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{1265472(bc - ad)^4 g^2 (a + bx)} + \frac{d^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3796416(bc - ad)^3 g^2} \right) dx \\
&= -\frac{(b^3 d) \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx} dx}{1265472(bc - ad)^4 g^2} + \frac{(b^2 d^2) \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx} dx}{1265472(bc - ad)^4 g^2} + \frac{b^3 \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^2} dx}{3796416(bc - ad)^3 g^2} \\
&= -\frac{b^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3796416(bc - ad)^3 g^2 (a + bx)} - \frac{d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7592832(bc - ad)^2 g^2 (c + dx)^2} - \frac{bd \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{1898208(bc - ad)^2 g^2} \\
&= -\frac{b^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3796416(bc - ad)^3 g^2 (a + bx)} - \frac{d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7592832(bc - ad)^2 g^2 (c + dx)^2} - \frac{bd \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{1898208(bc - ad)^2 g^2} \\
&= -\frac{b^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3796416(bc - ad)^3 g^2 (a + bx)} - \frac{d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7592832(bc - ad)^2 g^2 (c + dx)^2} - \frac{bd \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{1898208(bc - ad)^2 g^2} \\
&= -\frac{b^2 Bn}{3796416(bc - ad)^3 g^2 (a + bx)} + \frac{Bdn}{15185664(bc - ad)^2 g^2 (c + dx)^2} + \frac{5bBd}{7592832(bc - ad)^2 g^2} \\
&= -\frac{b^2 Bn}{3796416(bc - ad)^3 g^2 (a + bx)} + \frac{Bdn}{15185664(bc - ad)^2 g^2 (c + dx)^2} + \frac{5bBd}{7592832(bc - ad)^2 g^2} \\
&= -\frac{b^2 Bn}{3796416(bc - ad)^3 g^2 (a + bx)} + \frac{Bdn}{15185664(bc - ad)^2 g^2 (c + dx)^2} + \frac{5bBd}{7592832(bc - ad)^2 g^2}
\end{aligned}$$

**Mathematica [C]** time = 0.806644, size = 477, normalized size = 1.25

$$6b^2 Bdn \left( \log(a + bx) \left( \log(a + bx) - 2 \log\left(\frac{b(c+dx)}{bc-ad}\right) \right) - 2 \text{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) \right) - 6b^2 Bdn \left( 2 \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right) + \log(c + dx) \right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^2*(c*i + d*i*x)^3), x]
```



```
[Out] ((-4*b^3*B*c*n)/(a + b*x) + (4*a*b^2*B*d*n)/(a + b*x) + (B*d*(b*c - a*d)^2*n)/(c + d*x)^2 + (8*b^2*B*c*d*n)/(c + d*x) - (8*a*b*B*d^2*n)/(c + d*x) + (2*b*B*d*(b*c - a*d)*n)/(c + d*x) + 6*b^2*B*d*n*Log[a + b*x] - (4*b^2*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x) - (2*d*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c + d*x)^2 - (8*b*d*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c + d*x) - 12*b^2*d*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 6*b^2*B*d*n*Log[c + d*x] + 12*b^2*d*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + 6*b^2*B*d*n*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-b*c + a*d)]) - Log[c + d*x]*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(4*(b*c - a*d)^4*g^2*i^3)
```

**Maple [F]** time = 0.716, size = 0, normalized size = 0.

$$\int \frac{1}{(bgx + ag)^2 (dix + ci)^3} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x)
```

**Maxima [B]** time = 1.83472, size = 2327, normalized size = 6.11

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x, algorithm="maxima")
```

```
[Out] -1/2*B*((6*b^2*d^2*x^2 + 2*b^2*c^2 + 5*a*b*c*d - a^2*d^2 + 3*(3*b^2*c*d + a*b*d^2)*x)/((b^4*c^3*d^2 - 3*a*b^3*c^2*d^3 + 3*a^2*b^2*c*d^4 - a^3*b*d^5)*g^2*i^3*x^3 + (2*b^4*c^4*d - 5*a*b^3*c^3*d^2 + 3*a^2*b^2*c^2*d^3 + a^3*b*c*d^4 - a^4*d^5)*g^2*i^3*x^2 + (b^4*c^5 - a*b^3*c^4*d - 3*a^2*b^2*c^3*d^2 + 5*a^3*b*c^2*d^3 - 2*a^4*c*d^4)*g^2*i^3*x + (a*b^3*c^5 - 3*a^2*b^2*c^4*d + 3*a^3*b*c^3*d^2 - a^4*c^2*d^3)*g^2*i^3) + 6*b^2*d*log(b*x + a)/((b^4*c^4 - 4*a
```

```

*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^2*i^3) - 6*b^2*
d*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^
3 + a^4*d^4)*g^2*i^3))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) - 1/4*(4*b^3*
c^3 - 15*a*b^2*c^2*d + 12*a^2*b*c*d^2 - a^3*d^3 - 6*(b^3*c*d^2 - a*b^2*d^3)
*x^2 - 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*
c^2*d + 2*a*b^2*c*d^2)*x)*log(b*x + a)^2 - 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (
2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*log(d*x + c)^
2 - 3*(b^3*c^2*d + 2*a*b^2*c*d^2 - 3*a^2*b*d^3)*x - 6*(b^3*d^3*x^3 + a*b^2*
c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*log(
b*x + a) + 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (
b^3*c^2*d + 2*a*b^2*c*d^2)*x + 2*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2
+ a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*log(b*x + a))*log(d*x + c
))*B*n/(a*b^4*c^6*g^2*i^3 - 4*a^2*b^3*c^5*d*g^2*i^3 + 6*a^3*b^2*c^4*d^2*g^2
*i^3 - 4*a^4*b*c^3*d^3*g^2*i^3 + a^5*c^2*d^4*g^2*i^3 + (b^5*c^4*d^2*g^2*i^3
- 4*a*b^4*c^3*d^3*g^2*i^3 + 6*a^2*b^3*c^2*d^4*g^2*i^3 - 4*a^3*b^2*c*d^5*g^
2*i^3 + a^4*b*d^6*g^2*i^3)*x^3 + (2*b^5*c^5*d*g^2*i^3 - 7*a*b^4*c^4*d^2*g^2
*i^3 + 8*a^2*b^3*c^3*d^3*g^2*i^3 - 2*a^3*b^2*c^2*d^4*g^2*i^3 - 2*a^4*b*c*d^
5*g^2*i^3 + a^5*d^6*g^2*i^3)*x^2 + (b^5*c^6*g^2*i^3 - 2*a*b^4*c^5*d*g^2*i^3
- 2*a^2*b^3*c^4*d^2*g^2*i^3 + 8*a^3*b^2*c^3*d^3*g^2*i^3 - 7*a^4*b*c^2*d^4*
g^2*i^3 + 2*a^5*c*d^5*g^2*i^3)*x) - 1/2*A*((6*b^2*d^2*x^2 + 2*b^2*c^2 + 5*a
*b*c*d - a^2*d^2 + 3*(3*b^2*c*d + a*b*d^2)*x)/((b^4*c^3*d^2 - 3*a*b^3*c^2*d
^3 + 3*a^2*b^2*c*d^4 - a^3*b*d^5)*g^2*i^3*x^3 + (2*b^4*c^4*d - 5*a*b^3*c^3*
d^2 + 3*a^2*b^2*c^2*d^3 + a^3*b*c*d^4 - a^4*d^5)*g^2*i^3*x^2 + (b^4*c^5 - a
*b^3*c^4*d - 3*a^2*b^2*c^3*d^2 + 5*a^3*b*c^2*d^3 - 2*a^4*c*d^4)*g^2*i^3*x +
(a*b^3*c^5 - 3*a^2*b^2*c^4*d + 3*a^3*b*c^3*d^2 - a^4*c^2*d^3)*g^2*i^3) + 6
*b^2*d*log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b
*c*d^3 + a^4*d^4)*g^2*i^3) - 6*b^2*d*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d
+ 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^2*i^3))

```

---

**Fricas [B]** time = 0.582539, size = 1956, normalized size = 5.13

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```

[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x, a
lgorithm="fricas")

```

```

[Out] -1/4*(4*A*b^3*c^3 + 6*A*a*b^2*c^2*d - 12*A*a^2*b*c*d^2 + 2*A*a^3*d^3 + 6*(2
*A*b^3*c*d^2 - 2*A*a*b^2*d^3 - (B*b^3*c*d^2 - B*a*b^2*d^3)*n)*x^2 + 6*(B*b^
3*d^3*n*x^3 + B*a*b^2*c^2*d*n + (2*B*b^3*c*d^2 + B*a*b^2*d^3)*n*x^2 + (B*b^
3*c^2*d + 2*B*a*b^2*c*d^2)*n*x)*log((b*x + a)/(d*x + c))^2 + (4*B*b^3*c^3 -

```

$$\begin{aligned}
& 15B^2a^2b^2c^2d + 12B^2a^2b^2c^2d^2 - B^2a^3d^3)n + 3(6A^2b^3c^2d - 4A^2a^2b^2c^2d^2 - 2A^2a^2b^2d^3 - (B^2b^3c^2d + 2B^2a^2b^2c^2d^2 - 3B^2a^2b^2d^3)n)x \\
& + 2(2B^2b^3c^3 + 3B^2a^2b^2c^2d - 6B^2a^2b^2c^2d^2 + B^2a^3d^3 + 6(B^2b^3c^2d^2 - B^2a^2b^2d^3)x^2 + 3(3B^2b^3c^2d - 2B^2a^2b^2c^2d^2 - B^2a^2b^2d^3)x \\
& + 6(B^2b^3d^3x^3 + B^2a^2b^2c^2d + (2B^2b^3c^2d^2 + B^2a^2b^2d^3)x^2 + (B^2b^3c^2d + 2B^2a^2b^2c^2d^2)x) \log((bx+a)/(dx+c)) \log(e) \\
& + 2(6A^2a^2b^2c^2d - 3(B^2b^3d^3n - 2A^2b^3d^3)x^3 - 3(3B^2a^2b^2d^3n - 4A^2b^3c^2d^2 - 2A^2a^2b^2d^3)x^2 + (2B^2b^3c^3 - 6B^2a^2b^2c^2d^2 + B^2a^3d^3)n \\
& + 3(2A^2b^3c^2d + 4A^2a^2b^2c^2d^2 + (2B^2b^3c^2d - 4B^2a^2b^2c^2d^2 - B^2a^2b^2d^3)n)x) \log((bx+a)/(dx+c)) / ((b^5c^4d^2 - 4a^2b^4c^3d^3 + 6a^2b^3c^2d^4 - 4a^3b^2c^2d^5 + a^4b^2d^6)g^2i^3x^3 \\
& + (2b^5c^5d - 7a^2b^4c^4d^2 + 8a^2b^3c^3d^3 - 2a^3b^2c^2d^4 - 2a^4b^2c^2d^5 + a^5d^6)g^2i^3x^2 + (b^5c^6 - 2a^2b^4c^5d - 2a^2b^3c^4d^2 + 8a^3b^2c^3d^3 - 7a^4b^2c^2d^4 + 2a^5c^2d^5)g^2i^3x \\
& + (a^2b^4c^6 - 4a^2b^3c^5d + 6a^3b^2c^4d^2 - 4a^4b^2c^3d^3 + a^5c^2d^4)g^2i^3)
\end{aligned}$$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n))/(b\*g\*x+a\*g)\*\*2/(d\*i\*x+c\*i)\*\*3,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A}{(bgx+ag)^2(dx+ci)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^2/(d\*i\*x+c\*i)^3,x, algorithm="giac")

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)/((b*g*x + a*g)^2*(d*i*x + c*i)^3), x)
```

$$3.157 \quad \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^3(ci+dix)^3} dx$$

**Optimal.** Leaf size=483

$$\frac{6b^2d^2 \log\left(\frac{a+bx}{c+dx}\right) \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{g^3i^3(bc-ad)^5} - \frac{b^4(c+dx)^2 \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{2g^3i^3(a+bx)^2(bc-ad)^5} + \frac{4b^3d(c+dx) \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{g^3i^3(a+bx)(bc-ad)^5}$$

[Out]  $-(B*d^4*n*(a+b*x)^2)/(4*(b*c-a*d)^5*g^3*i^3*(c+d*x)^2) + (4*b*B*d^3*n*(a+b*x))/((b*c-a*d)^5*g^3*i^3*(c+d*x)) + (4*b^3*B*d*n*(c+d*x))/((b*c-a*d)^5*g^3*i^3*(a+b*x)) - (b^4*B*n*(c+d*x)^2)/(4*(b*c-a*d)^5*g^3*i^3*(a+b*x)^2) + (d^4*(a+b*x)^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(2*(b*c-a*d)^5*g^3*i^3*(c+d*x)^2) - (4*b*d^3*(a+b*x)*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/((b*c-a*d)^5*g^3*i^3*(c+d*x)) + (4*b^3*d*(c+d*x)*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/((b*c-a*d)^5*g^3*i^3*(a+b*x)) - (b^4*(c+d*x)^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(2*(b*c-a*d)^5*g^3*i^3*(a+b*x)^2) + (6*b^2*d^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n])*Log[(a+b*x)/(c+d*x)])/((b*c-a*d)^5*g^3*i^3) - (3*b^2*B*d^2*n*Log[(a+b*x)/(c+d*x)]^2)/((b*c-a*d)^5*g^3*i^3)$

**Rubi [C]** time = 1.38898, antiderivative size = 701, normalized size of antiderivative = 1.45, number of steps used = 34, number of rules used = 11, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.256$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{6b^2Bd^2n \text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{g^3i^3(bc-ad)^5} + \frac{6b^2Bd^2n \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{g^3i^3(bc-ad)^5} + \frac{6b^2d^2 \log(a+bx) \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{g^3i^3(bc-ad)^5} - \frac{6b^2d^2 \log(a+bx)}{g^3i^3(bc-ad)^5}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])/((a\*g + b\*g\*x)^3\*(c\*i + d\*i\*x)^3), x]

[Out]  $-(b^2*B*n)/(4*(b*c-a*d)^3*g^3*i^3*(a+b*x)^2) + (7*b^2*B*d*n)/(2*(b*c-a*d)^4*g^3*i^3*(a+b*x)) - (B*d^2*n)/(4*(b*c-a*d)^3*g^3*i^3*(c+d*x)^2) - (7*b*B*d^2*n)/(2*(b*c-a*d)^4*g^3*i^3*(c+d*x)) - (3*b^2*B*d^2*n*Log[a+b*x]^2)/((b*c-a*d)^5*g^3*i^3) - (b^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(2*(b*c-a*d)^3*g^3*i^3*(a+b*x)^2) + (3*b^2*d*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/((b*c-a*d)^4*g^3*i^3*(a+b*x)) + (d^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(2*(b*c-a*d)^3*g^3*i^3*(c+d*x)^2) + (3*b*d^2)$

$$\frac{(A + B \cdot \log[e \cdot ((a + b \cdot x)/(c + d \cdot x))^n])}{(b \cdot c - a \cdot d)^4 \cdot g^3 \cdot i^3 \cdot (c + d \cdot x)} + \frac{(6 \cdot b^2 \cdot d^2 \cdot \log[a + b \cdot x] \cdot (A + B \cdot \log[e \cdot ((a + b \cdot x)/(c + d \cdot x))^n])}{(b \cdot c - a \cdot d)^5 \cdot g^3 \cdot i^3} + \frac{(6 \cdot b^2 \cdot B \cdot d^2 \cdot n \cdot \log[-((d \cdot (a + b \cdot x))/(b \cdot c - a \cdot d))] \cdot \log[c + d \cdot x])}{(b \cdot c - a \cdot d)^5 \cdot g^3 \cdot i^3} - \frac{(6 \cdot b^2 \cdot d^2 \cdot (A + B \cdot \log[e \cdot ((a + b \cdot x)/(c + d \cdot x))^n]) \cdot \log[c + d \cdot x])}{(b \cdot c - a \cdot d)^5 \cdot g^3 \cdot i^3} - \frac{(3 \cdot b^2 \cdot B \cdot d^2 \cdot n \cdot \log[c + d \cdot x]^2)}{(b \cdot c - a \cdot d)^5 \cdot g^3 \cdot i^3} + \frac{(6 \cdot b^2 \cdot B \cdot d^2 \cdot n \cdot \log[a + b \cdot x] \cdot \log[(b \cdot (c + d \cdot x))/(b \cdot c - a \cdot d)])}{(b \cdot c - a \cdot d)^5 \cdot g^3 \cdot i^3} + \frac{(6 \cdot b^2 \cdot B \cdot d^2 \cdot n \cdot \text{PolyLog}[2, -((d \cdot (a + b \cdot x))/(b \cdot c - a \cdot d)])}{(b \cdot c - a \cdot d)^5 \cdot g^3 \cdot i^3} + \frac{(6 \cdot b^2 \cdot B \cdot d^2 \cdot n \cdot \text{PolyLog}[2, (b \cdot (c + d \cdot x))/(b \cdot c - a \cdot d)])}{(b \cdot c - a \cdot d)^5 \cdot g^3 \cdot i^3}$$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]
] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n]^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}
\int \frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(157c + 157dx)^3(ag + bgx)^3} dx &= \int \left( \frac{b^3 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3869893(bc - ad)^3 g^3 (a + bx)^3} - \frac{3b^3 d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3869893(bc - ad)^4 g^3 (a + bx)^2} + \frac{6b^3 d^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3869893(bc - ad)^5 g^3 (a + bx)} \right) dx \\
&= \frac{(6b^3 d^2) \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx} dx}{3869893(bc - ad)^5 g^3} - \frac{(6b^2 d^3) \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx} dx}{3869893(bc - ad)^5 g^3} - \frac{(3b^3 d) \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^2} dx}{3869893(bc - ad)^5 g^3} \\
&= -\frac{b^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7739786(bc - ad)^3 g^3 (a + bx)^2} + \frac{3b^2 d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3869893(bc - ad)^4 g^3 (a + bx)} + \frac{d^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7739786(bc - ad)^5 g^3 (a + bx)} \\
&= -\frac{b^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7739786(bc - ad)^3 g^3 (a + bx)^2} + \frac{3b^2 d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3869893(bc - ad)^4 g^3 (a + bx)} + \frac{d^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7739786(bc - ad)^5 g^3 (a + bx)} \\
&= -\frac{b^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7739786(bc - ad)^3 g^3 (a + bx)^2} + \frac{3b^2 d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3869893(bc - ad)^4 g^3 (a + bx)} + \frac{d^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7739786(bc - ad)^5 g^3 (a + bx)} \\
&= -\frac{b^2 B n}{15479572(bc - ad)^3 g^3 (a + bx)^2} + \frac{7b^2 B d n}{7739786(bc - ad)^4 g^3 (a + bx)} - \frac{B d^2 n}{15479572(bc - ad)^5 g^3 (a + bx)} \\
&= -\frac{b^2 B n}{15479572(bc - ad)^3 g^3 (a + bx)^2} + \frac{7b^2 B d n}{7739786(bc - ad)^4 g^3 (a + bx)} - \frac{B d^2 n}{15479572(bc - ad)^5 g^3 (a + bx)} \\
&= -\frac{b^2 B n}{15479572(bc - ad)^3 g^3 (a + bx)^2} + \frac{7b^2 B d n}{7739786(bc - ad)^4 g^3 (a + bx)} - \frac{B d^2 n}{15479572(bc - ad)^5 g^3 (a + bx)}
\end{aligned}$$

**Mathematica [C]** time = 1.35937, size = 561, normalized size = 1.16

$$12b^2 B d^2 n \left( \log(a + bx) \left( \log(a + bx) - 2 \log\left(\frac{b(c+dx)}{bc-ad}\right) \right) - 2 \text{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) \right) - 12b^2 B d^2 n \left( 2 \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right) + \log\left(\frac{b(c+dx)}{bc-ad}\right) \right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/((a*g + b*g*x)^3*(c*i + d*i*x)^3), x]
```



```
[Out] -((b^2*B*(b*c - a*d)^2*n)/(a + b*x)^2 - (12*b^3*B*c*d*n)/(a + b*x) + (12*a*
b^2*B*d^2*n)/(a + b*x) - (2*b^2*B*d*(b*c - a*d)*n)/(a + b*x) + (B*d^2*(b*c
- a*d)^2*n)/(c + d*x)^2 + (12*b^2*B*c*d^2*n)/(c + d*x) - (12*a*b*B*d^3*n)/(
c + d*x) + (2*b*B*d^2*(b*c - a*d)*n)/(c + d*x) + (2*b^2*(b*c - a*d)^2*(A +
B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x)^2 - (12*b^2*d*(b*c - a*d)*(A +
B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x) - (2*d^2*(b*c - a*d)^2*(A + B
*Log[e*((a + b*x)/(c + d*x))^n]))/(c + d*x)^2 - (12*b*d^2*(b*c - a*d)*(A +
B*Log[e*((a + b*x)/(c + d*x))^n]))/(c + d*x) - 24*b^2*d^2*Log[a + b*x]*(A +
B*Log[e*((a + b*x)/(c + d*x))^n]) + 24*b^2*d^2*(A + B*Log[e*((a + b*x)/(c
+ d*x))^n])*Log[c + d*x] + 12*b^2*B*d^2*n*(Log[a + b*x]*(Log[a + b*x] - 2*L
og[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]
) - 12*b^2*B*d^2*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Lo
g[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(4*(b*c - a*d)^5*g^3
*i^3)
```

**Maple [F]** time = 0.745, size = 0, normalized size = 0.

$$\int \frac{1}{(bgx + ag)^3 (dix + ci)^3} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x)
```

**Maxima [B]** time = 1.90219, size = 3217, normalized size = 6.66

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x, a
lgorithm="maxima")
```

```
[Out] 1/2*B*((12*b^3*d^3*x^3 - b^3*c^3 + 7*a*b^2*c^2*d + 7*a^2*b*c*d^2 - a^3*d^3
+ 18*(b^3*c*d^2 + a*b^2*d^3)*x^2 + 4*(b^3*c^2*d + 7*a*b^2*c*d^2 + a^2*b*d^3
)*x)/((b^6*c^4*d^2 - 4*a*b^5*c^3*d^3 + 6*a^2*b^4*c^2*d^4 - 4*a^3*b^3*c*d^5
+ a^4*b^2*d^6)*g^3*i^3*x^4 + 2*(b^6*c^5*d - 3*a*b^5*c^4*d^2 + 2*a^2*b^4*c^3
```

$$\begin{aligned}
& *d^3 + 2*a^3*b^3*c^2*d^4 - 3*a^4*b^2*c*d^5 + a^5*b*d^6)*g^3*i^3*x^3 + (b^6*c^6 - 9*a^2*b^4*c^4*d^2 + 16*a^3*b^3*c^3*d^3 - 9*a^4*b^2*c^2*d^4 + a^6*d^6) \\
& *g^3*i^3*x^2 + 2*(a*b^5*c^6 - 3*a^2*b^4*c^5*d + 2*a^3*b^3*c^4*d^2 + 2*a^4*b^2*c^3*d^3 - 3*a^5*b*c^2*d^4 + a^6*c*d^5)*g^3*i^3*x + (a^2*b^4*c^6 - 4*a^3*b^3*c^5*d + 6*a^4*b^2*c^4*d^2 - 4*a^5*b*c^3*d^3 + a^6*c^2*d^4)*g^3*i^3) + 1 \\
& 2*b^2*d^2*\log(b*x + a)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^3*i^3) - 12*b^2*d^2*\log(d*x + c)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^3*i^3))*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) - 1 \\
& /4*(b^4*c^4 - 16*a*b^3*c^3*d + 30*a^2*b^2*c^2*d^2 - 16*a^3*b*c*d^3 + a^4*d^4 - 12*(b^4*c^2*d^2 - 2*a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 12*(b^4*d^4*x^4 + a^2*b^2*c^2*d^2 + 2*(b^4*c*d^3 + a*b^3*d^4)*x^3 + (b^4*c^2*d^2 + 4*a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 2*(a*b^3*c^2*d^2 + a^2*b^2*c*d^3)*x)*\log(b*x + a)^2 - 24*(b^4*d^4*x^4 + a^2*b^2*c^2*d^2 + 2*(b^4*c*d^3 + a*b^3*d^4)*x^3 + (b^4*c^2*d^2 + 4*a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 2*(a*b^3*c^2*d^2 + a^2*b^2*c*d^3)*x)*\log(b*x + a)*\log(d*x + c) + 12*(b^4*d^4*x^4 + a^2*b^2*c^2*d^2 + 2*(b^4*c*d^3 + a*b^3*d^4)*x^3 + (b^4*c^2*d^2 + 4*a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 2*(a*b^3*c^2*d^2 + a^2*b^2*c*d^3)*x)*\log(d*x + c)^2 - 12*(b^4*c^3*d - a*b^3*c^2*d^2 - a^2*b^2*c*d^3 + a^3*b*d^4)*x)*B^n/(a^2*b^5*c^7*g^3*i^3 - 5*a^3*b^4*c^6*d*g^3*i^3 + 10*a^4*b^3*c^5*d^2*g^3*i^3 - 10*a^5*b^2*c^4*d^3*g^3*i^3 + 5*a^6*b*c^3*d^4*g^3*i^3 - a^7*c^2*d^5*g^3*i^3 + (b^7*c^5*d^2*g^3*i^3 - 5*a*b^6*c^4*d^3*g^3*i^3 + 10*a^2*b^5*c^3*d^4*g^3*i^3 - 10*a^3*b^4*c^2*d^5*g^3*i^3 + 5*a^4*b^3*c*d^6*g^3*i^3 - a^5*b^2*d^7*g^3*i^3)*x^4 + 2*(b^7*c^6*d*g^3*i^3 - 4*a*b^6*c^5*d^2*g^3*i^3 + 5*a^2*b^5*c^4*d^3*g^3*i^3 - 5*a^4*b^3*c^2*d^5*g^3*i^3 + 4*a^5*b^2*c*d^6*g^3*i^3 - a^6*b*d^7*g^3*i^3)*x^3 + (b^7*c^7*g^3*i^3 - a*b^6*c^6*d*g^3*i^3 - 9*a^2*b^5*c^5*d^2*g^3*i^3 + 25*a^3*b^4*c^4*d^3*g^3*i^3 - 25*a^4*b^3*c^3*d^4*g^3*i^3 + 9*a^5*b^2*c^2*d^5*g^3*i^3 + a^6*b*c*d^6*g^3*i^3 - a^7*d^7*g^3*i^3)*x^2 + 2*(a*b^6*c^7*g^3*i^3 - 4*a^2*b^5*c^6*d*g^3*i^3 + 5*a^3*b^4*c^5*d^2*g^3*i^3 - 5*a^5*b^2*c^3*d^4*g^3*i^3 + 4*a^6*b*c^2*d^5*g^3*i^3 - a^7*c*d^6*g^3*i^3)*x) + 1/2*A*((12*b^3*d^3*x^3 - b^3*c^3 + 7*a*b^2*c^2*d + 7*a^2*b*c*d^2 - a^3*d^3 + 18*(b^3*c*d^2 + a*b^2*d^3)*x^2 + 4*(b^3*c^2*d + 7*a*b^2*c*d^2 + a^2*b*d^3)*x)/((b^6*c^4*d^2 - 4*a*b^5*c^3*d^3 + 6*a^2*b^4*c^2*d^4 - 4*a^3*b^3*c*d^5 + a^4*b^2*d^6)*g^3*i^3*x^4 + 2*(b^6*c^5*d - 3*a*b^5*c^4*d^2 + 2*a^2*b^4*c^3*d^3 + 2*a^3*b^3*c^2*d^4 - 3*a^4*b^2*c*d^5 + a^5*b*d^6)*g^3*i^3*x^3 + (b^6*c^6 - 9*a^2*b^4*c^4*d^2 + 16*a^3*b^3*c^3*d^3 - 9*a^4*b^2*c^2*d^4 + a^6*d^6)*g^3*i^3*x^2 + 2*(a*b^5*c^6 - 3*a^2*b^4*c^5*d + 2*a^3*b^3*c^4*d^2 + 2*a^4*b^2*c^3*d^3 - 3*a^5*b*c^2*d^4 + a^6*c*d^5)*g^3*i^3*x + (a^2*b^4*c^6 - 4*a^3*b^3*c^5*d + 6*a^4*b^2*c^4*d^2 - 4*a^5*b*c^3*d^3 + a^6*c^2*d^4)*g^3*i^3) + 12*b^2*d^2*\log(b*x + a)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^3*i^3) - 12*b^2*d^2*\log(d*x + c)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^3*i^3))
\end{aligned}$$

---

**Fricas [B]** time = 0.684744, size = 2859, normalized size = 5.92

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^3/(d\*i\*x+c\*i)^3,x, algorithm="fricas")

[Out] 
$$-1/4*(2*A*b^4*c^4 - 16*A*a*b^3*c^3*d + 16*A*a^3*b*c*d^3 - 2*A*a^4*d^4 - 24*(A*b^4*c*d^3 - A*a*b^3*d^4)*x^3 - 12*(3*A*b^4*c^2*d^2 - 3*A*a^2*b^2*d^4 + (B*b^4*c^2*d^2 - 2*B*a*b^3*c*d^3 + B*a^2*b^2*d^4)*n)*x^2 - 12*(B*b^4*d^4*n*x^4 + B*a^2*b^2*c^2*d^2*n + 2*(B*b^4*c*d^3 + B*a*b^3*d^4)*n*x^3 + (B*b^4*c^2*d^2 + 4*B*a*b^3*c*d^3 + B*a^2*b^2*d^4)*n*x^2 + 2*(B*a*b^3*c^2*d^2 + B*a^2*b^2*c*d^3)*n*x)*\log((b*x + a)/(d*x + c))^2 + (B*b^4*c^4 - 16*B*a*b^3*c^3*d + 30*B*a^2*b^2*c^2*d^2 - 16*B*a^3*b*c*d^3 + B*a^4*d^4)*n - 4*(2*A*b^4*c^3*d + 12*A*a*b^3*c^2*d^2 - 12*A*a^2*b^2*c*d^3 - 2*A*a^3*b*d^4 + 3*(B*b^4*c^3*d - B*a*b^3*c^2*d^2 - B*a^2*b^2*c*d^3 + B*a^3*b*d^4)*n)*x + 2*(B*b^4*c^4 - 8*B*a*b^3*c^3*d + 8*B*a^3*b*c*d^3 - B*a^4*d^4 - 12*(B*b^4*c*d^3 - B*a*b^3*d^4)*x^3 - 18*(B*b^4*c^2*d^2 - B*a^2*b^2*d^4)*x^2 - 4*(B*b^4*c^3*d + 6*B*a*b^3*c^2*d^2 - 6*B*a^2*b^2*c*d^3 - B*a^3*b*d^4)*x - 12*(B*b^4*d^4*x^4 + B*a^2*b^2*c^2*d^2 + 2*(B*b^4*c*d^3 + B*a*b^3*d^4)*x^3 + (B*b^4*c^2*d^2 + 4*B*a*b^3*c*d^3 + B*a^2*b^2*d^4)*x^2 + 2*(B*a*b^3*c^2*d^2 + B*a^2*b^2*c*d^3)*x)*\log((b*x + a)/(d*x + c)))*\log(e) - 2*(12*A*b^4*d^4*x^4 + 12*A*a^2*b^2*c^2*d^2 + 12*(2*A*b^4*c*d^3 + 2*A*a*b^3*d^4 + (B*b^4*c*d^3 - B*a*b^3*d^4)*n)*x^3 + 6*(2*A*b^4*c^2*d^2 + 8*A*a*b^3*c*d^3 + 2*A*a^2*b^2*d^4 + 3*(B*b^4*c^2*d^2 - B*a^2*b^2*d^4)*n)*x^2 - (B*b^4*c^4 - 8*B*a*b^3*c^3*d + 8*B*a^3*b*c*d^3 - B*a^4*d^4)*n + 4*(6*A*a*b^3*c^2*d^2 + 6*A*a^2*b^2*c*d^3 + (B*b^4*c^3*d + 6*B*a*b^3*c^2*d^2 - 6*B*a^2*b^2*c*d^3 - B*a^3*b*d^4)*n)*x)*\log((b*x + a)/(d*x + c)))/((b^7*c^5*d^2 - 5*a*b^6*c^4*d^3 + 10*a^2*b^5*c^3*d^4 - 10*a^3*b^4*c^2*d^5 + 5*a^4*b^3*c*d^6 - a^5*b^2*d^7)*g^3*i^3*x^4 + 2*(b^7*c^6*d - 4*a*b^6*c^5*d^2 + 5*a^2*b^5*c^4*d^3 - 5*a^4*b^3*c^2*d^5 + 4*a^5*b^2*c*d^6 - a^6*b*d^7)*g^3*i^3*x^3 + (b^7*c^7 - a*b^6*c^6*d - 9*a^2*b^5*c^5*d^2 + 25*a^3*b^4*c^4*d^3 - 25*a^4*b^3*c^3*d^4 + 9*a^5*b^2*c^2*d^5 + a^6*b*c*d^6 - a^7*d^7)*g^3*i^3*x^2 + 2*(a*b^6*c^7 - 4*a^2*b^5*c^6*d + 5*a^3*b^4*c^5*d^2 - 5*a^5*b^2*c^3*d^4 + 4*a^6*b*c^2*d^5 - a^7*c*d^6)*g^3*i^3*x + (a^2*b^5*c^7 - 5*a^3*b^4*c^6*d + 10*a^4*b^3*c^5*d^2 - 10*a^5*b^2*c^4*d^3 + 5*a^6*b*c^3*d^4 - a^7*c^2*d^5)*g^3*i^3)$$

---

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n))/(b\*g\*x+a\*g)\*\*3/(d\*i\*x+c\*i)\*\*3,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{B \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A}{(bgx + ag)^3 (dix + ci)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^3/(d\*i\*x+c\*i)^3,x, algorithm="giac")

[Out] integrate((B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)/((b\*g\*x + a\*g)^3\*(d\*i\*x + c\*i)^3), x)

$$3.158 \quad \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^4(ci+dix)^3} dx$$

**Optimal.** Leaf size=587

$$\frac{10b^3d^2(c+dx)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^4i^3(a+bx)(bc-ad)^6} - \frac{10b^2d^3 \log\left(\frac{a+bx}{c+dx}\right)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^4i^3(bc-ad)^6} - \frac{b^5(c+dx)^3\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3g^4i^3(a+bx)^3(bc-ad)^6}$$

[Out]  $(B*d^5*n*(a + b*x)^2)/(4*(b*c - a*d)^6*g^4*i^3*(c + d*x)^2) - (5*b*B*d^4*n*(a + b*x))/((b*c - a*d)^6*g^4*i^3*(c + d*x)) - (10*b^3*B*d^2*n*(c + d*x))/((b*c - a*d)^6*g^4*i^3*(a + b*x)) + (5*b^4*B*d*n*(c + d*x)^2)/(4*(b*c - a*d)^6*g^4*i^3*(a + b*x)^2) - (b^5*B*n*(c + d*x)^3)/(9*(b*c - a*d)^6*g^4*i^3*(a + b*x)^3) - (d^5*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^6*g^4*i^3*(c + d*x)^2) + (5*b*d^4*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^6*g^4*i^3*(c + d*x)) - (10*b^3*d^2*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^6*g^4*i^3*(a + b*x)) + (5*b^4*d*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^6*g^4*i^3*(a + b*x)^2) - (b^5*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*(b*c - a*d)^6*g^4*i^3*(a + b*x)^3) - (10*b^2*d^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(a + b*x)/(c + d*x)])/((b*c - a*d)^6*g^4*i^3) + (5*b^2*B*d^3*n*Log[(a + b*x)/(c + d*x)]^2)/((b*c - a*d)^6*g^4*i^3)$

**Rubi [C]** time = 1.69149, antiderivative size = 859, normalized size of antiderivative = 1.46, number of steps used = 38, number of rules used = 11, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.256$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{5b^2Bn \log^2(a+bx)d^3}{(bc-ad)^6g^4i^3} + \frac{5b^2Bn \log^2(c+dx)d^3}{(bc-ad)^6g^4i^3} - \frac{10b^2Bn \log(a+bx)d^3}{3(bc-ad)^6g^4i^3} - \frac{10b^2 \log(a+bx)\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)d^3}{(bc-ad)^6g^4i^3}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])/((a\*g + b\*g\*x)^4\*(c\*i + d\*i\*x)^3), x]

[Out]  $-(b^2*B*n)/(9*(b*c - a*d)^3*g^4*i^3*(a + b*x)^3) + (11*b^2*B*d*n)/(12*(b*c - a*d)^4*g^4*i^3*(a + b*x)^2) - (47*b^2*B*d^2*n)/(6*(b*c - a*d)^5*g^4*i^3*(a + b*x)) + (B*d^3*n)/(4*(b*c - a*d)^4*g^4*i^3*(c + d*x)^2) + (9*b*B*d^3*n)/(2*(b*c - a*d)^5*g^4*i^3*(c + d*x)) - (10*b^2*B*d^3*n*Log[a + b*x])/(3*(b*c - a*d)^6*g^4*i^3) + (5*b^2*B*d^3*n*Log[a + b*x]^2)/((b*c - a*d)^6*g^4*i^3)$

$$\begin{aligned}
& - (b^2(A + B \operatorname{Log}[e*((a + b*x)/(c + d*x))^n])) / (3*(b*c - a*d)^3*g^4*i^3*(a + b*x)^3) + (3*b^2*d*(A + B \operatorname{Log}[e*((a + b*x)/(c + d*x))^n])) / (2*(b*c - a*d)^4*g^4*i^3*(a + b*x)^2) - (6*b^2*d^2*(A + B \operatorname{Log}[e*((a + b*x)/(c + d*x))^n])) / ((b*c - a*d)^5*g^4*i^3*(a + b*x)) - (d^3*(A + B \operatorname{Log}[e*((a + b*x)/(c + d*x))^n])) / (2*(b*c - a*d)^4*g^4*i^3*(c + d*x)^2) - (4*b*d^3*(A + B \operatorname{Log}[e*((a + b*x)/(c + d*x))^n])) / ((b*c - a*d)^5*g^4*i^3*(c + d*x)) - (10*b^2*d^3 \operatorname{Log}[a + b*x]*(A + B \operatorname{Log}[e*((a + b*x)/(c + d*x))^n])) / ((b*c - a*d)^6*g^4*i^3) + (10*b^2*B*d^3*n \operatorname{Log}[c + d*x]) / (3*(b*c - a*d)^6*g^4*i^3) - (10*b^2*B*d^3*n \operatorname{Log}[-(d*(a + b*x))/(b*c - a*d)]* \operatorname{Log}[c + d*x]) / ((b*c - a*d)^6*g^4*i^3) + (10*b^2*d^3*(A + B \operatorname{Log}[e*((a + b*x)/(c + d*x))^n])* \operatorname{Log}[c + d*x]) / ((b*c - a*d)^6*g^4*i^3) + (5*b^2*B*d^3*n \operatorname{Log}[c + d*x]^2) / ((b*c - a*d)^6*g^4*i^3) - (10*b^2*B*d^3*n \operatorname{Log}[a + b*x]* \operatorname{Log}[(b*(c + d*x))/(b*c - a*d)]) / ((b*c - a*d)^6*g^4*i^3) - (10*b^2*B*d^3*n \operatorname{PolyLog}[2, -(d*(a + b*x))/(b*c - a*d)]) / ((b*c - a*d)^6*g^4*i^3) - (10*b^2*B*d^3*n \operatorname{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]) / ((b*c - a*d)^6*g^4*i^3)
\end{aligned}$$

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x] }, Int[u, x] /; SumQ[u]
] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

```

### Rule 2525

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.), x_Symbol] := Simp[ ((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n) / (e*(m + 1)), x] - Dist[(b*n*p) / (e*(m + 1)), Int[SimplifyIntegrand[ ((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x]) / RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

```

### Rule 12

```

Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]

```

### Rule 44

```

Int[((a_) + (b_.)*(x_.))^(m_.)*((c_.) + (d_.)*(x_.))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])

```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}
\int \frac{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(158c + 158dx)^3(ag + bgx)^4} dx &= \int \left( \frac{b^3 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3944312(bc - ad)^3 g^4 (a + bx)^4} - \frac{3b^3 d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3944312(bc - ad)^4 g^4 (a + bx)^3} + \frac{3b^3 d^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{1972156(bc - ad)^5 g^4 (a + bx)^2} \right. \\
&= -\frac{(5b^3 d^3) \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx} dx}{1972156(bc - ad)^6 g^4} + \frac{(5b^2 d^4) \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx} dx}{1972156(bc - ad)^6 g^4} + \frac{(3b^3 d^2) \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^2} dx}{1972156(bc - ad)^6 g^4} \\
&= -\frac{b^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{11832936(bc - ad)^3 g^4 (a + bx)^3} + \frac{3b^2 d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7888624(bc - ad)^4 g^4 (a + bx)^2} - \frac{3b^2 d^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{1972156(bc - ad)^5 g^4 (a + bx)} \\
&= -\frac{b^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{11832936(bc - ad)^3 g^4 (a + bx)^3} + \frac{3b^2 d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7888624(bc - ad)^4 g^4 (a + bx)^2} - \frac{3b^2 d^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{1972156(bc - ad)^5 g^4 (a + bx)} \\
&= -\frac{b^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{11832936(bc - ad)^3 g^4 (a + bx)^3} + \frac{3b^2 d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{7888624(bc - ad)^4 g^4 (a + bx)^2} - \frac{3b^2 d^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{1972156(bc - ad)^5 g^4 (a + bx)} \\
&= -\frac{b^2 B n}{35498808(bc - ad)^3 g^4 (a + bx)^3} + \frac{11b^2 B d n}{47331744(bc - ad)^4 g^4 (a + bx)^2} - \frac{47b^2 B d^2 n}{23665872(bc - ad)^5 g^4 (a + bx)} \\
&= -\frac{b^2 B n}{35498808(bc - ad)^3 g^4 (a + bx)^3} + \frac{11b^2 B d n}{47331744(bc - ad)^4 g^4 (a + bx)^2} - \frac{47b^2 B d^2 n}{23665872(bc - ad)^5 g^4 (a + bx)} \\
&= -\frac{b^2 B n}{35498808(bc - ad)^3 g^4 (a + bx)^3} + \frac{11b^2 B d n}{47331744(bc - ad)^4 g^4 (a + bx)^2} - \frac{47b^2 B d^2 n}{23665872(bc - ad)^5 g^4 (a + bx)}
\end{aligned}$$

**Mathematica [C]** time = 2.08042, size = 671, normalized size = 1.14

$$-180b^2 B d^3 n \left( \log(a + bx) \left( \log(a + bx) - 2 \log\left(\frac{b(c+dx)}{bc-ad}\right) \right) - 2 \text{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) \right) + 180b^2 B d^3 n \left( 2 \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right) \right)$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])/((a\*g + b\*g\*x)^4\*(c\*i + d\*i\*x)^3), x]



```
[Out] -((4*b^2*B*(b*c - a*d)^3*n)/(a + b*x)^3 - (33*b^2*B*d*(b*c - a*d)^2*n)/(a +
b*x)^2 + (216*b^3*B*c*d^2*n)/(a + b*x) - (216*a*b^2*B*d^3*n)/(a + b*x) + (
66*b^2*B*d^2*(b*c - a*d)*n)/(a + b*x) - (9*B*d^3*(b*c - a*d)^2*n)/(c + d*x)
^2 - (144*b^2*B*c*d^3*n)/(c + d*x) + (144*a*b*B*d^4*n)/(c + d*x) - (18*b*B*
d^3*(b*c - a*d)*n)/(c + d*x) + 120*b^2*B*d^3*n*Log[a + b*x] + (12*b^2*(b*c
- a*d)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x)^3 - (54*b^2*d*(b
*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x)^2 + (216*b^2*
d^2*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(a + b*x) + (18*d^3
*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c + d*x)^2 + (144*b
*d^3*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(c + d*x) + 360*b^
2*d^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 120*b^2*B*d^3*n
*Log[c + d*x] - 360*b^2*d^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c +
d*x] - 180*b^2*B*d^3*n*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b
*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-b*c + a*d)]) + 180*b^2*B*d^3*n
*((2*Log[(d*(a + b*x))/(-b*c + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*Pol
yLog[2, (b*(c + d*x))/(b*c - a*d)]))/(36*(b*c - a*d)^6*g^4*i^3)
```

**Maple [F]** time = 0.726, size = 0, normalized size = 0.

$$\int \frac{1}{(bgx + ag)^4 (dix + ci)^3} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x)
```

**Maxima [B]** time = 3.15538, size = 5156, normalized size = 8.78

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4/(d*i*x+c*i)^3,x, a
lgorithm="maxima")
```

```
[Out] -1/6*B*((60*b^4*d^4*x^4 + 2*b^4*c^4 - 13*a*b^3*c^3*d + 47*a^2*b^2*c^2*d^2 +
27*a^3*b*c*d^3 - 3*a^4*d^4 + 30*(3*b^4*c*d^3 + 5*a*b^3*d^4)*x^3 + 10*(2*b^
```

$$\begin{aligned}
& 4c^2d^2 + 23a^2b^3cd^3 + 11a^2b^2d^4) x^2 - 5(b^4c^3d - 11a^2b^3c^2d^2 - 35a^2b^2c^3d^3 - 3a^3b^4d^4) x / ((b^8c^5d^2 - 5a^2b^7c^4d^3 + 10a^2b^6c^3d^4 - 10a^3b^5c^2d^5 + 5a^4b^4c^2d^6 - a^5b^3d^7) \\
& ) g^4 i^3 x^5 + (2b^8c^6d - 7a^2b^7c^5d^2 + 5a^2b^6c^4d^3 + 10a^3b^5c^3d^4 - 20a^4b^4c^2d^5 + 13a^5b^3c^2d^6 - 3a^6b^2d^7) g^4 i^3 x^4 + (b^8c^7 + a^2b^7c^6d - 17a^2b^6c^5d^2 + 35a^3b^5c^4d^3 - \\
& 25a^4b^4c^3d^4 - a^5b^3c^2d^5 + 9a^6b^2c^2d^6 - 3a^7b^2d^7) g^4 i^3 x^3 + (3a^2b^7c^7 - 9a^2b^6c^6d + a^3b^5c^5d^2 + 25a^4b^4c^4d^3 - 35a^5b^3c^3d^4 + 17a^6b^2c^2d^5 - a^7b^2c^2d^6 - a^8d^7) g^4 \\
& i^3 x^2 + (3a^2b^6c^7 - 13a^3b^5c^6d + 20a^4b^4c^5d^2 - 10a^5b^3c^4d^3 - 5a^6b^2c^3d^4 + 7a^7b^2c^2d^5 - 2a^8c^2d^6) g^4 i^3 x + (a^3b^5c^7 - 5a^4b^4c^6d + 10a^5b^3c^5d^2 - 10a^6b^2c^4d^3 + \\
& 5a^7b^2c^3d^4 - a^8c^2d^5) g^4 i^3 + 60b^2d^3 \log(bx + a) / ((b^6c^6 - 6a^2b^5c^5d + 15a^2b^4c^4d^2 - 20a^3b^3c^3d^3 + 15a^4b^2c^2d^4 - 6a^5b^2c^2d^5 + a^6d^6) g^4 i^3) - 60b^2d^3 \log(dx + c) / ((b^6c^6 - 6a^2b^5c^5d + 15a^2b^4c^4d^2 - 20a^3b^3c^3d^3 + 15a^4b^2c^2d^4 - 6a^5b^2c^2d^5 + a^6d^6) g^4 i^3) * \log(e*(bx/(dx + c) + a/(dx + c)))^n - 1/36(4b^5c^5 - 45a^2b^4c^4d + 360a^2b^3c^3d^2 - 490a^3b^2c^2d^3 + 180a^4b^2c^2d^4 - 9a^5d^5 + 120*(b^5c^4d - a^2b^4d^5) x^4 + 120*(3b^5c^2d^3 - 2a^2b^4c^2d^4 - a^2b^3d^5) x^3 + 20*(11b^5c^3d^2 + 21a^2b^4c^2d^3 - 39a^2b^3c^2d^4 + 7a^3b^2d^5) x^2 - 180*(b^5d^5 x^5 + a^3b^2c^2d^3 + (2b^5c^4d + 3a^2b^4d^5) x^4 + (b^5c^2d^3 + 6a^2b^4c^2d^4 + 3a^2b^3d^5) x^3 + (3a^2b^4c^2d^3 + 6a^2b^3c^2d^4 + a^3b^2d^5) x^2 + (3a^2b^3c^2d^3 + 2a^3b^2c^2d^4) x) * \log(bx + a)^2 - 180*(b^5d^5 x^5 + a^3b^2c^2d^3 + (2b^5c^4d + 3a^2b^4d^5) x^4 + (b^5c^2d^3 + 6a^2b^4c^2d^4 + 3a^2b^3d^5) x^3 + (3a^2b^4c^2d^3 + 6a^2b^3c^2d^4 + a^3b^2d^5) x^2 + (3a^2b^3c^2d^3 + 2a^3b^2c^2d^4) x) * \log(dx + c)^2 - 5*(5b^5c^4d - 108a^2b^4c^3d^2 + 78a^2b^3c^2d^3 + 52a^3b^2c^2d^4 - 27a^4b^2d^5) x + 120*(b^5d^5 x^5 + a^3b^2c^2d^3 + (2b^5c^4d + 3a^2b^4d^5) x^4 + (b^5c^2d^3 + 6a^2b^4c^2d^4 + 3a^2b^3d^5) x^3 + (3a^2b^4c^2d^3 + 6a^2b^3c^2d^4 + a^3b^2d^5) x^2 + (3a^2b^3c^2d^3 + 2a^3b^2c^2d^4) x) * \log(bx + a) - 120*(b^5d^5 x^5 + a^3b^2c^2d^3 + (2b^5c^4d + 3a^2b^4d^5) x^4 + (b^5c^2d^3 + 6a^2b^4c^2d^4 + 3a^2b^3d^5) x^3 + (3a^2b^4c^2d^3 + 6a^2b^3c^2d^4 + a^3b^2d^5) x^2 + (3a^2b^3c^2d^3 + 2a^3b^2c^2d^4) x) * \log(bx + a) * \log(dx + c) * B^n / (a^3b^6c^8 g^4 i^3 - 6a^4b^5c^7 d g^4 i^3 + 15a^5b^4c^6 d^2 g^4 i^3 - 20a^6b^3c^5 d^3 g^4 i^3 + 15a^7b^2c^4 d^4 g^4 i^3 - 6a^8b^2c^3 d^5 g^4 i^3 + a^9c^2 d^6 g^4 i^3 + (b^9c^6 d^2 g^4 i^3 - 6a^2b^8c^5 d^3 g^4 i^3 + 15a^2b^7c^4 d^4 g^4 i^3 - 20a^3b^6c^3 d^5 g^4 i^3 + 15a^4b^5c^2 d^6 g^4 i^3 - 6a^5b^4c^2 d^7 g^4 i^3 + a^6b^3c^2 d^8 g^4 i^3) x^5 + (2b^9c^7 d g^4 i^3 - 9a^2b^8c^6 d^2 g^4 i^3 + 12a^2b^7c^5 d^3 g^4 i^3 + 5a^3b^6c^4 d^4 g^4 i^3 - 30a^4b^5c^3 d^5 g^4 i^3 + 33a^5b^4c^2 d^6 g^4 i^3
\end{aligned}$$

$$\begin{aligned}
& - 16a^6b^3c^3d^7g^4i^3 + 3a^7b^2d^8g^4i^3)x^4 + (b^9c^8g^4i^3 \\
& - 18a^2b^7c^6d^2g^4i^3 + 52a^3b^6c^5d^3g^4i^3 - 60a^4b^5c^4d^4g^4i^3 + 24a^5b^4c^3d^5g^4i^3 + 10a^6b^3c^2d^6g^4i^3 - 12a^7b^2c^1d^7g^4i^3 + 3a^8b^1d^8g^4i^3)x^3 + (3a^8b^8c^8g^4i^3 - 12a^2b^7c^7d^7g^4i^3 + 10a^3b^6c^6d^2g^4i^3 + 24a^4b^5c^5d^3g^4i^3 - 60a^5b^4c^4d^4g^4i^3 + 52a^6b^3c^3d^5g^4i^3 - 18a^7b^2c^2d^6g^4i^3 + a^9d^8g^4i^3)x^2 + (3a^2b^7c^8g^4i^3 - 16a^3b^6c^7d^7g^4i^3 + 33a^4b^5c^6d^2g^4i^3 - 30a^5b^4c^5d^3g^4i^3 + 5a^6b^3c^4d^4g^4i^3 + 12a^7b^2c^3d^5g^4i^3 - 9a^8b^1c^2d^6g^4i^3 + 2a^9c^1d^7g^4i^3)x) - 1/6A*((60b^4d^4x^4 + 2b^4c^4 - 13ab^3c^3d + 47a^2b^2c^2d^2 + 27a^3b^1cd^3 - 3a^4d^4 + 30(3b^4c^3d^3 + 5ab^3d^4)x^3 + 10(2b^4c^2d^2 + 23ab^3c^3d^3 + 11a^2b^2d^4)x^2 - 5(b^4c^3d - 11ab^3c^2d^2 - 35a^2b^2c^1d^3 - 3a^3b^1d^4)x)/((b^8c^5d^2 - 5ab^7c^4d^3 + 10a^2b^6c^3d^4 - 10a^3b^5c^2d^5 + 5a^4b^4c^1d^6 - a^5b^3d^7)g^4i^3x^5 + (2b^8c^6d - 7ab^7c^5d^2 + 5a^2b^6c^4d^3 + 10a^3b^5c^3d^4 - 20a^4b^4c^2d^5 + 13a^5b^3c^1d^6 - 3a^6b^2d^7)g^4i^3x^4 + (b^8c^7 + ab^7c^6d - 17a^2b^6c^5d^2 + 35a^3b^5c^4d^3 - 25a^4b^4c^3d^4 - a^5b^3c^2d^5 + 9a^6b^2c^1d^6 - 3a^7b^1d^7)g^4i^3x^3 + (3ab^7c^7 - 9a^2b^6c^6d + a^3b^5c^5d^2 + 25a^4b^4c^4d^3 - 35a^5b^3c^3d^4 + 17a^6b^2c^2d^5 - a^7b^1c^1d^6 - a^8d^7)g^4i^3x^2 + (3a^2b^6c^7 - 13a^3b^5c^6d + 20a^4b^4c^5d^2 - 10a^5b^3c^4d^3 - 5a^6b^2c^3d^4 + 7a^7b^1c^2d^5 - 2a^8c^1d^6)g^4i^3x + (a^3b^5c^7 - 5a^4b^4c^6d + 10a^5b^3c^5d^2 - 10a^6b^2c^4d^3 + 5a^7b^1c^3d^4 - a^8c^2d^5)g^4i^3) + 60b^2d^3*log(b*x + a)/((b^6c^6 - 6ab^5c^5d + 15a^2b^4c^4d^2 - 20a^3b^3c^3d^3 + 15a^4b^2c^2d^4 - 6a^5b^1c^1d^5 + a^6d^6)g^4i^3) - 60b^2d^3*log(d*x + c)/((b^6c^6 - 6ab^5c^5d + 15a^2b^4c^4d^2 - 20a^3b^3c^3d^3 + 15a^4b^2c^2d^4 - 6a^5b^1c^1d^5 + a^6d^6)g^4i^3))
\end{aligned}$$

**Fricas [B]** time = 0.76607, size = 4535, normalized size = 7.73

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))/(b\*g\*x+a\*g)^4/(d\*i\*x+c\*i)^3,x, a lgorithm="fricas")

[Out]  $-1/36*(12A*b^5*c^5 - 90A*a*b^4*c^4*d + 360A*a^2*b^3*c^3*d^2 - 120A*a^3*b^2*c^2*d^3 - 180A*a^4*b*c*d^4 + 18A*a^5*d^5 + 120*(3A*b^5*c*d^4 - 3A*a*b^4*d^5 + (B*b^5*c*d^4 - B*a*b^4*d^5)*n)*x^4 + 60*(9A*b^5*c^2*d^3 + 6A*a$

$$\begin{aligned}
& *b^4*c*d^4 - 15*A*a^2*b^3*d^5 + 2*(3*B*b^5*c^2*d^3 - 2*B*a*b^4*c*d^4 - B*a^2*b^3*d^5)*n)*x^3 + 20*(6*A*b^5*c^3*d^2 + 63*A*a*b^4*c^2*d^3 - 36*A*a^2*b^3*c*d^4 - 33*A*a^3*b^2*d^5 + (11*B*b^5*c^3*d^2 + 21*B*a*b^4*c^2*d^3 - 39*B*a^2*b^3*c*d^4 + 7*B*a^3*b^2*d^5)*n)*x^2 + 180*(B*b^5*d^5*n*x^5 + B*a^3*b^2*c^2*d^3*n + (2*B*b^5*c*d^4 + 3*B*a*b^4*d^5)*n*x^4 + (B*b^5*c^2*d^3 + 6*B*a*b^4*c*d^4 + 3*B*a^2*b^3*d^5)*n*x^3 + (3*B*a*b^4*c^2*d^3 + 6*B*a^2*b^3*c*d^4 + B*a^3*b^2*d^5)*n*x^2 + (3*B*a^2*b^3*c^2*d^3 + 2*B*a^3*b^2*c*d^4)*n*x)*\log((b*x + a)/(d*x + c))^2 + (4*B*b^5*c^5 - 45*B*a*b^4*c^4*d + 360*B*a^2*b^3*c^3*d^2 - 490*B*a^3*b^2*c^2*d^3 + 180*B*a^4*b*c*d^4 - 9*B*a^5*d^5)*n - 5*(6*A*b^5*c^4*d - 72*A*a*b^4*c^3*d^2 - 144*A*a^2*b^3*c^2*d^3 + 192*A*a^3*b^2*c*d^4 + 18*A*a^4*b*d^5 + (5*B*b^5*c^4*d - 108*B*a*b^4*c^3*d^2 + 78*B*a^2*b^3*c^2*d^3 + 52*B*a^3*b^2*c*d^4 - 27*B*a^4*b*d^5)*n)*x + 6*(2*B*b^5*c^5 - 15*B*a*b^4*c^4*d + 60*B*a^2*b^3*c^3*d^2 - 20*B*a^3*b^2*c^2*d^3 - 30*B*a^4*b*c*d^4 + 3*B*a^5*d^5 + 60*(B*b^5*c*d^4 - B*a*b^4*d^5)*x^4 + 30*(3*B*b^5*c^2*d^3 + 2*B*a*b^4*c*d^4 - 5*B*a^2*b^3*d^5)*x^3 + 10*(2*B*b^5*c^3*d^2 + 21*B*a*b^4*c^2*d^3 - 12*B*a^2*b^3*c*d^4 - 11*B*a^3*b^2*d^5)*x^2 - 5*(B*b^5*c^4*d - 12*B*a*b^4*c^3*d^2 - 24*B*a^2*b^3*c^2*d^3 + 32*B*a^3*b^2*c*d^4 + 3*B*a^4*b*d^5)*x + 60*(B*b^5*d^5*x^5 + B*a^3*b^2*c^2*d^3 + (2*B*b^5*c*d^4 + 3*B*a*b^4*d^5)*x^4 + (B*b^5*c^2*d^3 + 6*B*a*b^4*c*d^4 + 3*B*a^2*b^3*d^5)*x^3 + (3*B*a*b^4*c^2*d^3 + 6*B*a^2*b^3*c*d^4 + B*a^3*b^2*d^5)*x^2 + (3*B*a^2*b^3*c^2*d^3 + 2*B*a^3*b^2*c*d^4)*x)*\log((b*x + a)/(d*x + c))*\log(e) + 6*(60*A*a^3*b^2*c^2*d^3 + 20*(B*b^5*d^5*n + 3*A*b^5*d^5)*x^5 + 20*(5*B*b^5*c*d^4*n + 6*A*b^5*c*d^4 + 9*A*a*b^4*d^5)*x^4 + 10*(6*A*b^5*c^2*d^3 + 36*A*a*b^4*c*d^4 + 18*A*a^2*b^3*d^5 + (11*B*b^5*c^2*d^3 + 18*B*a*b^4*c*d^4 - 9*B*a^2*b^3*d^5)*n)*x^3 + 10*(18*A*a*b^4*c^2*d^3 + 36*A*a^2*b^3*c*d^4 + 6*A*a^3*b^2*d^5 + (2*B*b^5*c^3*d^2 + 27*B*a*b^4*c^2*d^3 - 9*B*a^3*b^2*d^5)*n)*x^2 + (2*B*b^5*c^5 - 15*B*a*b^4*c^4*d + 60*B*a^2*b^3*c^3*d^2 - 30*B*a^4*b*c*d^4 + 3*B*a^5*d^5)*n + 5*(36*A*a^2*b^3*c^2*d^3 + 24*A*a^3*b^2*c*d^4 - (B*b^5*c^4*d - 12*B*a*b^4*c^3*d^2 - 36*B*a^2*b^3*c^2*d^3 + 24*B*a^3*b^2*c*d^4 + 3*B*a^4*b*d^5)*n)*x)*\log((b*x + a)/(d*x + c)))/((b^9*c^6*d^2 - 6*a*b^8*c^5*d^3 + 15*a^2*b^7*c^4*d^4 - 20*a^3*b^6*c^3*d^5 + 15*a^4*b^5*c^2*d^6 - 6*a^5*b^4*c*d^7 + a^6*b^3*d^8)*g^4*i^3*x^5 + (2*b^9*c^7*d - 9*a*b^8*c^6*d^2 + 12*a^2*b^7*c^5*d^3 + 5*a^3*b^6*c^4*d^4 - 30*a^4*b^5*c^3*d^5 + 33*a^5*b^4*c^2*d^6 - 16*a^6*b^3*c*d^7 + 3*a^7*b^2*d^8)*g^4*i^3*x^4 + (b^9*c^8 - 18*a^2*b^7*c^6*d^2 + 52*a^3*b^6*c^5*d^3 - 60*a^4*b^5*c^4*d^4 + 24*a^5*b^4*c^3*d^5 + 10*a^6*b^3*c^2*d^6 - 12*a^7*b^2*c*d^7 + 3*a^8*b*d^8)*g^4*i^3*x^3 + (3*a*b^8*c^8 - 12*a^2*b^7*c^7*d + 10*a^3*b^6*c^6*d^2 + 24*a^4*b^5*c^5*d^3 - 60*a^5*b^4*c^4*d^4 + 52*a^6*b^3*c^3*d^5 - 18*a^7*b^2*c^2*d^6 + a^9*d^8)*g^4*i^3*x^2 + (3*a^2*b^7*c^8 - 16*a^3*b^6*c^7*d + 33*a^4*b^5*c^6*d^2 - 30*a^5*b^4*c^5*d^3 + 5*a^6*b^3*c^4*d^4 + 12*a^7*b^2*c^3*d^5 - 9*a^8*b*c^2*d^6 + 2*a^9*c*d^7)*g^4*i^3*x + (a^3*b^6*c^8 - 6*a^4*b^5*c^7*d + 15*a^5*b^4*c^6*d^2 - 20*a^6*b^3*c^5*d^3 + 15*a^7*b^2*c^4*d^4 - 6*a^8*b*c^3*d^5 + a^9*c^2*d^6)*g^4*i^3)
\end{aligned}$$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n)))/(b\*g\*x+a\*g)\*\*4/(d\*i\*x+c\*i)\*\*3,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A}{(bgx + ag)^4 (dix + ci)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n)))/(b\*g\*x+a\*g)^4/(d\*i\*x+c\*i)^3,x, algorithm="giac")

[Out] integrate((B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)/((b\*g\*x + a\*g)^4\*(d\*i\*x + c\*i)^3), x)

$$3.159 \quad \int (ag+bgx)^3(ci+dix) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx$$

**Optimal.** Leaf size=584

$$\frac{B^2 g^3 i n^2 (bc - ad)^5 \text{PolyLog} \left( 2, \frac{d(a+bx)}{b(c+dx)} \right)}{10b^2 d^4} - \frac{B g^3 i n (bc - ad)^5 \log \left( \frac{bc-ad}{b(c+dx)} \right) \left( 6B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + 6A + 11Bn \right)}{60b^2 d^4} - \frac{B g^3 i n (a + b x)^2 (bc - ad)^5}{10b^2 d^4}$$

[Out]  $(3*B^2*(b*c - a*d)^4*g^3*i*n^2*x)/(10*b*d^3) - (3*B^2*(b*c - a*d)^3*g^3*i*n^2*(c + d*x)^2)/(20*d^4) + (b*B^2*(b*c - a*d)^2*g^3*i*n^2*(c + d*x)^3)/(30*d^4) - (B*(b*c - a*d)^2*g^3*i*n*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(30*b^2*d) - (B*(b*c - a*d)*g^3*i*n*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(10*b^2) + ((b*c - a*d)*g^3*i*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(20*b^2) + (g^3*i*(a + b*x)^4*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(5*b) + (B*(b*c - a*d)^3*g^3*i*n*(a + b*x)^2*(3*A + B*n + 3*B*Log[e*((a + b*x)/(c + d*x))^n]))/(60*b^2*d^2) - (B*(b*c - a*d)^4*g^3*i*n*(a + b*x)*(6*A + 5*B*n + 6*B*Log[e*((a + b*x)/(c + d*x))^n]))/(60*b^2*d^3) - (B*(b*c - a*d)^5*g^3*i*n*(6*A + 11*B*n + 6*B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(60*b^2*d^4) - (B^2*(b*c - a*d)^5*g^3*i*n^2*Log[c + d*x])/(10*b^2*d^4) - (B^2*(b*c - a*d)^5*g^3*i*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(10*b^2*d^4)$

**Rubi [A]** time = 1.90112, antiderivative size = 670, normalized size of antiderivative = 1.15, number of steps used = 52, number of rules used = 13, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.302$ , Rules used = {2528, 2525, 12, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{B^2 g^3 i n^2 (bc - ad)^5 \text{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right)}{10b^2 d^4} + \frac{B g^3 i n (bc - ad)^5 \log(c + dx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{10b^2 d^4} + \frac{B g^3 i n (a + b x)^2 (bc - ad)^5}{10b^2 d^4}$$

Antiderivative was successfully verified.

[In] Int[(a\*g + b\*g\*x)^3\*(c\*i + d\*i\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2, x]

[Out]  $-(A*B*(b*c - a*d)^4*g^3*i*n*x)/(10*b*d^3) + (B^2*(b*c - a*d)^4*g^3*i*n^2*x)/(60*b*d^3) - (B^2*(b*c - a*d)^3*g^3*i*n^2*(a + b*x)^2)/(30*b^2*d^2) + (B^2*(b*c - a*d)^2*g^3*i*n^2*(a + b*x)^3)/(30*b^2*d) - (B^2*(b*c - a*d)^4*g^3*i*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(10*b^2*d^3) + (B*(b*c - a*d)^3*g^3*i*n*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(20*b^2*d^2)$

$$\begin{aligned}
& - (B*(b*c - a*d)^2*g^{3*i*n}*(a + b*x)^3*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]))/(30*b^2*d) - (B*(b*c - a*d)*g^{3*i*n}*(a + b*x)^4*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]))/(10*b^2) + ((b*c - a*d)*g^{3*i}*(a + b*x)^4*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]))^2/(4*b^2) + (d*g^{3*i}*(a + b*x)^5*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]))^2/(5*b^2) + (B^2*(b*c - a*d)^5*g^{3*i*n^2}*\text{Log}[c + d*x])/(12*b^2*d^4) - (B^2*(b*c - a*d)^5*g^{3*i*n^2}*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/(10*b^2*d^4) + (B*(b*c - a*d)^5*g^{3*i*n}*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])*\text{Log}[c + d*x])/(10*b^2*d^4) + (B^2*(b*c - a*d)^5*g^{3*i*n^2}*\text{Log}[c + d*x]^2)/(20*b^2*d^4) - (B^2*(b*c - a*d)^5*g^{3*i*n^2}*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])/(10*b^2*d^4)
\end{aligned}$$

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]

```

### Rule 2525

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]

```

### Rule 12

```

Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]

```

### Rule 2486

```

Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_.))^(p_.))*((c_.) + (d_.)*(x_.))^(q_.)
^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q]^r]^s - 1/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]

```

### Rule 31

```

Int[((a_) + (b_.)*(x_.))^(n_.), x_Symbol] := Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]

```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(Rfx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, Rfx, x]},
Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
Rfx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)
]^n))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
```



qQ[e\*f - d\*g, 0]

Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] :> Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

Rubi steps

$$\begin{aligned}
\int (159c + 159dx)(ag + bgx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx &= \int \left( \frac{159(bc - ad)(ag + bgx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b} + 159d \right) dx \\
&= \frac{(159(bc - ad)) \int (ag + bgx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx}{b} \\
&= \frac{159(bc - ad)g^3(a + bx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{4b^2} + \frac{159d}{b} \int (ag + bgx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx \\
&= \frac{159(bc - ad)g^3(a + bx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{4b^2} + \frac{159d}{b} \int (ag + bgx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx \\
&= \frac{159(bc - ad)g^3(a + bx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{4b^2} + \frac{159d}{b} \int (ag + bgx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx \\
&= \frac{159(bc - ad)g^3(a + bx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{4b^2} + \frac{159d}{b} \int (ag + bgx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx \\
&= -\frac{159AB(bc - ad)^4 g^3 nx}{10bd^3} + \frac{159B(bc - ad)^3 g^3 n(a + bx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{20b^2 d^2} \\
&= -\frac{159AB(bc - ad)^4 g^3 nx}{10bd^3} - \frac{159B^2(bc - ad)^4 g^3 n(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{10b^2 d^3} \\
&= -\frac{159AB(bc - ad)^4 g^3 nx}{10bd^3} - \frac{159B^2(bc - ad)^4 g^3 n(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{10b^2 d^3} \\
&= -\frac{159AB(bc - ad)^4 g^3 nx}{10bd^3} + \frac{53B^2(bc - ad)^4 g^3 n^2 x}{20bd^3} - \frac{53B^2(bc - ad)^4 g^3 n(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{20bd^3} \\
&= -\frac{159AB(bc - ad)^4 g^3 nx}{10bd^3} + \frac{53B^2(bc - ad)^4 g^3 n^2 x}{20bd^3} - \frac{53B^2(bc - ad)^4 g^3 n(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{20bd^3} \\
&= -\frac{159AB(bc - ad)^4 g^3 nx}{10bd^3} + \frac{53B^2(bc - ad)^4 g^3 n^2 x}{20bd^3} - \frac{53B^2(bc - ad)^4 g^3 n(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{20bd^3}
\end{aligned}$$

**Mathematica [A]** time = 0.785927, size = 949, normalized size = 1.62

$$g^3 i \left( 4d \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 (a+bx)^5 + 5(bc-ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 (a+bx)^4 - \frac{5B(bc-ad)^2 n (-6Bn \log(c+dx)(bc-ad)}{\dots}$$

Antiderivative was successfully verified.

[In] Integrate[(a\*g + b\*g\*x)^3\*(c\*i + d\*i\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2,x]

[Out] (g^3\*i\*(5\*(b\*c - a\*d)\*(a + b\*x)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2 + 4\*d\*(a + b\*x)^5\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2 - (5\*B\*(b\*c - a\*d)^2\*n\*(6\*A\*b\*d\*(b\*c - a\*d)^2\*x + 6\*B\*d\*(b\*c - a\*d)^2\*(a + b\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n] + 3\*d^2\*(-(b\*c) + a\*d)\*(a + b\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 2\*d^3\*(a + b\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 6\*B\*(b\*c - a\*d)^3\*n\*Log[c + d\*x] - 6\*(b\*c - a\*d)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[c + d\*x] + B\*(b\*c - a\*d)\*n\*(2\*b\*d\*(b\*c - a\*d)\*x - d^2\*(a + b\*x)^2 - 2\*(b\*c - a\*d)^2\*Log[c + d\*x]) + 3\*B\*(b\*c - a\*d)^2\*n\*(b\*d\*x + (-(b\*c) + a\*d)\*Log[c + d\*x]) + 3\*B\*(b\*c - a\*d)^3\*n\*((2\*Log[(d\*(a + b\*x))]/(-(b\*c) + a\*d)) - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])))/(3\*d^4) + (B\*(b\*c - a\*d)\*n\*(24\*A\*b\*d\*(b\*c - a\*d)^3\*x + 24\*B\*d\*(b\*c - a\*d)^3\*(a + b\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n] - 12\*d^2\*(b\*c - a\*d)^2\*(a + b\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 8\*d^3\*(b\*c - a\*d)\*(a + b\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 6\*d^4\*(a + b\*x)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 24\*B\*(b\*c - a\*d)^4\*n\*Log[c + d\*x] - 24\*(b\*c - a\*d)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[c + d\*x] + 4\*B\*(b\*c - a\*d)^2\*n\*(2\*b\*d\*(b\*c - a\*d)\*x - d^2\*(a + b\*x)^2 - 2\*(b\*c - a\*d)^2\*Log[c + d\*x]) + B\*(b\*c - a\*d)\*n\*(6\*b\*d\*(b\*c - a\*d)^2\*x + 3\*d^2\*(-(b\*c) + a\*d)\*(a + b\*x)^2 + 2\*d^3\*(a + b\*x)^3 - 6\*(b\*c - a\*d)^3\*Log[c + d\*x]) + 12\*B\*(b\*c - a\*d)^3\*n\*(b\*d\*x + (-(b\*c) + a\*d)\*Log[c + d\*x]) + 12\*B\*(b\*c - a\*d)^4\*n\*((2\*Log[(d\*(a + b\*x))]/(-(b\*c) + a\*d)) - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])))/(3\*d^4))/(20\*b^2)

**Maple [F]** time = 0.526, size = 0, normalized size = 0.

$$\int (bgx + ag)^3 (dix + ci) \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

**Maxima [B]** time = 3.89072, size = 5081, normalized size = 8.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, a
lgorithm="maxima")
```

```
[Out] 2/5*A*B*b^3*d*g^3*i*x^5*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/5*A^2*b^
3*d*g^3*i*x^5 + 1/2*A*B*b^3*c*g^3*i*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))
^n) + 3/2*A*B*a*b^2*d*g^3*i*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/
4*A^2*b^3*c*g^3*i*x^4 + 3/4*A^2*a*b^2*d*g^3*i*x^4 + 2*A*B*a*b^2*c*g^3*i*x^3
*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 2*A*B*a^2*b*d*g^3*i*x^3*log(e*(b*
x/(d*x + c) + a/(d*x + c))^n) + A^2*a*b^2*c*g^3*i*x^3 + A^2*a^2*b*d*g^3*i*x
^3 + 3*A*B*a^2*b*c*g^3*i*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*B*a
^3*d*g^3*i*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/2*A^2*a^2*b*c*g^3
*i*x^2 + 1/2*A^2*a^3*d*g^3*i*x^2 + 1/30*A*B*b^3*d*g^3*i*n*(12*a^5*log(b*x +
a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4
*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 -
a^4*d^4)*x)/(b^4*d^4) - 1/12*A*B*b^3*c*g^3*i*n*(6*a^4*log(b*x + a)/b^4 -
6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^
2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3) - 1/4*A*B*a*b^2*d*g^3*i*
n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*
d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^
3) + A*B*a*b^2*c*g^3*i*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3
- ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2) + A*B*a^2*
b*d*g^3*i*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d -
a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2) - 3*A*B*a^2*b*c*g^3*i*n*
(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) - A*B*a
^3*d*g^3*i*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(
b*d)) + 2*A*B*a^3*c*g^3*i*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + 2*A*B*a
^3*c*g^3*i*x*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*a^3*c*g^3*i*x - 1
/60*(6*a^4*c*d^4*g^3*i*n^2 - (5*g^3*i*n^2 + 6*g^3*i*n*log(e))*b^4*c^5 + (19
*g^3*i*n^2 + 30*g^3*i*n*log(e))*a*b^3*c^4*d - (23*g^3*i*n^2 + 60*g^3*i*n*lo
g(e))*a^2*b^2*c^3*d^2 + 3*(g^3*i*n^2 + 20*g^3*i*n*log(e))*a^3*b*c^2*d^3)*B^
2*log(d*x + c)/(b*d^4) + 1/10*(b^5*c^5*g^3*i*n^2 - 5*a*b^4*c^4*d*g^3*i*n^2
+ 10*a^2*b^3*c^3*d^2*g^3*i*n^2 - 10*a^3*b^2*c^2*d^3*g^3*i*n^2 + 5*a^4*b*c*d
```

$$\begin{aligned}
& ^4g^3i^n^2 - a^5d^5g^3i^n^2) * (\log(b*x + a) * \log((b*d*x + a*d)/(b*c - a*d) + 1) + \text{dilog}(-(b*d*x + a*d)/(b*c - a*d))) * B^2 / (b^2*d^4) + 1/60 * (12*B^2*b^5*d^5*g^3i*x^5*\log(e)^2 - 3*((2*g^3i^n*\log(e) - 5*g^3i*\log(e)^2)*b^5*c*d^4 - (2*g^3i^n*\log(e) + 15*g^3i*\log(e)^2)*a*b^4*d^5)*B^2*x^4 + 2*((g^3i^n^2 - g^3i^n*\log(e))*b^5*c^2*d^3 - 2*(g^3i^n^2 + 5*g^3i^n*\log(e) - 15*g^3i*\log(e)^2)*a*b^4*c*d^4 + (g^3i^n^2 + 11*g^3i^n*\log(e) + 30*g^3i*\log(e)^2)*a^2*b^3*d^5)*B^2*x^3 - ((2*g^3i^n^2 - 3*g^3i^n*\log(e))*b^5*c^3*d^2 - 3*(4*g^3i^n^2 - 5*g^3i^n*\log(e))*a*b^4*c^2*d^3 + 3*(6*g^3i^n^2 + 5*g^3i^n*\log(e) - 30*g^3i*\log(e)^2)*a^2*b^3*c*d^4 - (8*g^3i^n^2 + 27*g^3i^n*\log(e) + 30*g^3i*\log(e)^2)*a^3*b^2*d^5)*B^2*x^2 - 3*(5*a^4*b*c*d^4*g^3i^n^2 - a^5*d^5*g^3i^n^2)*B^2*\log(b*x + a)^2 - 6*(b^5*c^5*g^3i^n^2 - 5*a*b^4*c^4*d*g^3i^n^2 + 10*a^2*b^3*c^3*d^2*g^3i^n^2 - 10*a^3*b^2*c^2*d^3*g^3i^n^2)*B^2*\log(b*x + a)*\log(d*x + c) + 3*(b^5*c^5*g^3i^n^2 - 5*a*b^4*c^4*d*g^3i^n^2 + 10*a^2*b^3*c^3*d^2*g^3i^n^2 - 10*a^3*b^2*c^2*d^3*g^3i^n^2)*B^2*\log(d*x + c)^2 + ((g^3i^n^2 - 6*g^3i^n*\log(e))*b^5*c^4*d - 2*(4*g^3i^n^2 - 15*g^3i^n*\log(e))*a*b^4*c^3*d^2 + 12*(2*g^3i^n^2 - 5*g^3i^n*\log(e))*a^2*b^3*c^2*d^3 - 2*(14*g^3i^n^2 - 15*g^3i^n*\log(e) - 30*g^3i*\log(e)^2)*a^3*b^2*c*d^4 + (11*g^3i^n^2 + 6*g^3i^n*\log(e))*a^4*b*d^5)*B^2*x - (6*a*b^4*c^4*d*g^3i^n^2 - 27*a^2*b^3*c^3*d^2*g^3i^n^2 + 47*a^3*b^2*c^2*d^3*g^3i^n^2 - (31*g^3i^n^2 + 30*g^3i^n*\log(e))*a^4*b*c*d^4 + (5*g^3i^n^2 + 6*g^3i^n*\log(e))*a^5*d^5)*B^2*\log(b*x + a) + 3*(4*B^2*b^5*d^5*g^3i*x^5 + 20*B^2*a^3*b^2*c*d^4*g^3i*x + 5*(b^5*c*d^4*g^3i + 3*a*b^4*d^5*g^3i)*B^2*x^4 + 20*(a*b^4*c*d^4*g^3i + a^2*b^3*d^5*g^3i)*B^2*x^3 + 10*(3*a^2*b^3*c*d^4*g^3i + a^3*b^2*d^5*g^3i)*B^2*x^2)*\log((b*x + a)^n)^2 + 3*(4*B^2*b^5*d^5*g^3i*x^5 + 20*B^2*a^3*b^2*c*d^4*g^3i*x + 5*(b^5*c*d^4*g^3i + 3*a*b^4*d^5*g^3i)*B^2*x^4 + 20*(a*b^4*c*d^4*g^3i + a^2*b^3*d^5*g^3i)*B^2*x^3 + 10*(3*a^2*b^3*c*d^4*g^3i + a^3*b^2*d^5*g^3i)*B^2*x^2)*\log((d*x + c)^n)^2 + (24*B^2*b^5*d^5*g^3i*x^5*\log(e) - 6*((g^3i^n - 5*g^3i*\log(e))*b^5*c*d^4 - (g^3i^n + 15*g^3i*\log(e))*a*b^4*d^5)*B^2*x^4 - 2*(b^5*c^2*d^3*g^3i^n + 10*(g^3i^n - 6*g^3i*\log(e))*a*b^4*c*d^4 - (11*g^3i^n + 60*g^3i*\log(e))*a^2*b^3*d^5)*B^2*x^3 + 3*(b^5*c^3*d^2*g^3i^n - 5*a*b^4*c^2*d^3*g^3i^n - 5*(g^3i^n - 12*g^3i*\log(e))*a^2*b^3*c*d^4 + (9*g^3i^n + 20*g^3i*\log(e))*a^3*b^2*d^5)*B^2*x^2 - 6*(b^5*c^4*d*g^3i^n - 5*a*b^4*c^3*d^2*g^3i^n + 10*a^2*b^3*c^2*d^3*g^3i^n - a^4*b*d^5*g^3i^n - 5*(g^3i^n + 4*g^3i*\log(e))*a^3*b^2*c*d^4)*B^2*x + 6*(5*a^4*b*c*d^4*g^3i^n - a^5*d^5*g^3i^n)*B^2*\log(b*x + a) + 6*(b^5*c^5*g^3i^n - 5*a*b^4*c^4*d*g^3i^n + 10*a^2*b^3*c^3*d^2*g^3i^n - 10*a^3*b^2*c^2*d^3*g^3i^n)*B^2*\log(d*x + c))*\log((b*x + a)^n) - (24*B^2*b^5*d^5*g^3i*x^5*\log(e) - 6*((g^3i^n - 5*g^3i*\log(e))*b^5*c*d^4 - (g^3i^n + 15*g^3i*\log(e))*a*b^4*d^5)*B^2*x^4 - 2*(b^5*c^2*d^3*g^3i^n + 10*(g^3i^n - 6*g^3i*\log(e))*a*b^4*c*d^4 - (11*g^3i^n + 60*g^3i*\log(e))*a^2*b^3*d^5)*B^2*x^3 + 3*(b^5*c^3*d^2*g^3i^n - 5*a*b^4*c^2*d^3*g^3i^n - 5*(g^3i^n - 12*g^3i*\log(e))*a^2*b^3*c*d^4 + (9*g^3i^n + 20*g^3i*\log(e))*a^3*b^2*d^5)*B^2*x^2 - 6*(b^5*c^4*d*g^3i^n - 5*a*b^4*c^3*d^2*g^3i^n + 10*a^2*b^3*c^2*d^3*g^3i^n - a^4*b*d^5*g^3i^n - 5*(g^3i^n + 4*g^3i*\log(e))*a^3*b^2*c*d^4)*B^2*x + 6*(5*a^4*b*c*d^4*g^3i^n - a^5*d^5*g^3i^n)*B^2*\log(
\end{aligned}$$

$$b*x + a) + 6*(b^5*c^5*g^{3*i*n} - 5*a*b^4*c^4*d*g^{3*i*n} + 10*a^2*b^3*c^3*d^2*g^{3*i*n} - 10*a^3*b^2*c^2*d^3*g^{3*i*n})*B^2*\log(d*x + c) + 6*(4*B^2*b^5*d^5*g^{3*i*x^5} + 20*B^2*a^3*b^2*c*d^4*g^{3*i*x} + 5*(b^5*c*d^4*g^{3*i} + 3*a*b^4*d^5*g^{3*i})*B^2*x^4 + 20*(a*b^4*c*d^4*g^{3*i} + a^2*b^3*d^5*g^{3*i})*B^2*x^3 + 10*(3*a^2*b^3*c*d^4*g^{3*i} + a^3*b^2*d^5*g^{3*i})*B^2*x^2)*\log((b*x + a)^n)*\log((d*x + c)^n))/(b^2*d^4)$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( A^2 b^3 d g^3 i x^4 + A^2 a^3 c g^3 i + (A^2 b^3 c + 3 A^2 a b^2 d) g^3 i x^3 + 3 (A^2 a b^2 c + A^2 a^2 b d) g^3 i x^2 + (3 A^2 a^2 b c + A^2 a^3 d) g^3 i x + \dots \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, a
lgorithm="fricas")
```

```
[Out] integral(A^2*b^3*d*g^3*i*x^4 + A^2*a^3*c*g^3*i + (A^2*b^3*c + 3*A^2*a*b^2*d)
)*g^3*i*x^3 + 3*(A^2*a*b^2*c + A^2*a^2*b*d)*g^3*i*x^2 + (3*A^2*a^2*b*c + A^
2*a^3*d)*g^3*i*x + (B^2*b^3*d*g^3*i*x^4 + B^2*a^3*c*g^3*i + (B^2*b^3*c + 3*
B^2*a*b^2*d)*g^3*i*x^3 + 3*(B^2*a*b^2*c + B^2*a^2*b*d)*g^3*i*x^2 + (3*B^2*a
^2*b*c + B^2*a^3*d)*g^3*i*x)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*B*b^3*
d*g^3*i*x^4 + A*B*a^3*c*g^3*i + (A*B*b^3*c + 3*A*B*a*b^2*d)*g^3*i*x^3 + 3*(
A*B*a*b^2*c + A*B*a^2*b*d)*g^3*i*x^2 + (3*A*B*a^2*b*c + A*B*a^3*d)*g^3*i*x)
*log(e*((b*x + a)/(d*x + c))^n), x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int (bgx + ag)^3 (dix + ci) \left( B \log \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) + A \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(d\*i\*x+c\*i)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2,x, algorithm="giac")

[Out] integrate((b\*g\*x + a\*g)^3\*(d\*i\*x + c\*i)\*(B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)^2, x)

$$3.160 \quad \int (ag+bgx)^2(ci+dix) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx$$

**Optimal.** Leaf size=487

$$\frac{B^2 g^2 \operatorname{in}^2(bc-ad)^4 \operatorname{PolyLog} \left( 2, \frac{d(a+bx)}{b(c+dx)} \right)}{6b^2 d^3} + \frac{Bg^2 \operatorname{in}(bc-ad)^4 \log \left( \frac{bc-ad}{b(c+dx)} \right) \left( 2B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + 2A + 3Bn \right)}{12b^2 d^3} + \frac{Bg^2 \operatorname{in}(a+bx)}{12b^2 d^3}$$

[Out]  $-(B^2*(b*c - a*d)^3*g^2*i*n^2*x)/(3*b*d^2) + (B^2*(b*c - a*d)^2*g^2*i*n^2*(c + d*x)^2)/(12*d^3) - (B*(b*c - a*d)^2*g^2*i*n*(a + b*x)^2*(A + B*\operatorname{Log}[e*((a + b*x)/(c + d*x))^n]])/(12*b^2*d) - (B*(b*c - a*d)*g^2*i*n*(a + b*x)^3*(A + B*\operatorname{Log}[e*((a + b*x)/(c + d*x))^n]])/(6*b^2) + ((b*c - a*d)*g^2*i*(a + b*x)^3*(A + B*\operatorname{Log}[e*((a + b*x)/(c + d*x))^n]]^2)/(12*b^2) + (g^2*i*(a + b*x)^3*(c + d*x)*(A + B*\operatorname{Log}[e*((a + b*x)/(c + d*x))^n]]^2)/(4*b) + (B*(b*c - a*d)^3*g^2*i*n*(a + b*x)*(2*A + B*n + 2*B*\operatorname{Log}[e*((a + b*x)/(c + d*x))^n]])/(12*b^2*d^2) + (B*(b*c - a*d)^4*g^2*i*n*(2*A + 3*B*n + 2*B*\operatorname{Log}[e*((a + b*x)/(c + d*x))^n]]*\operatorname{Log}[(b*c - a*d)/(b*(c + d*x))])/(12*b^2*d^3) + (B^2*(b*c - a*d)^4*g^2*i*n^2*\operatorname{Log}[c + d*x])/(6*b^2*d^3) + (B^2*(b*c - a*d)^4*g^2*i*n^2*\operatorname{PolyLog}[2, (d*(a + b*x))/(b*(c + d*x))])/(6*b^2*d^3)$

**Rubi [A]** time = 1.58632, antiderivative size = 578, normalized size of antiderivative = 1.19, number of steps used = 44, number of rules used = 13, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.302$ , Rules used = {2528, 2525, 12, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{B^2 g^2 \operatorname{in}^2(bc-ad)^4 \operatorname{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right)}{6b^2 d^3} - \frac{Bg^2 \operatorname{in}(bc-ad)^4 \log(c+dx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{6b^2 d^3} - \frac{Bg^2 \operatorname{in}(a+bx)^2(bc-ad)^2}{12b^2 d^3}$$

Antiderivative was successfully verified.

[In]  $\operatorname{Int}[(a*g + b*g*x)^2*(c*i + d*i*x)*(A + B*\operatorname{Log}[e*((a + b*x)/(c + d*x))^n])^2, x]$

[Out]  $(A*B*(b*c - a*d)^3*g^2*i*n*x)/(6*b*d^2) - (B^2*(b*c - a*d)^3*g^2*i*n^2*x)/(12*b*d^2) + (B^2*(b*c - a*d)^2*g^2*i*n^2*(a + b*x)^2)/(12*b^2*d) + (B^2*(b*c - a*d)^3*g^2*i*n*(a + b*x)*\operatorname{Log}[e*((a + b*x)/(c + d*x))^n]]/(6*b^2*d^2) - (B*(b*c - a*d)^2*g^2*i*n*(a + b*x)^2*(A + B*\operatorname{Log}[e*((a + b*x)/(c + d*x))^n]])/(12*b^2*d) - (B*(b*c - a*d)*g^2*i*n*(a + b*x)^3*(A + B*\operatorname{Log}[e*((a + b*x)/(c + d*x))^n]])/(6*b^2) + ((b*c - a*d)*g^2*i*(a + b*x)^3*(A + B*\operatorname{Log}[e*((a + b*x)/(c + d*x))^n]]^2)/(3*b^2) + (d*g^2*i*(a + b*x)^4*(A + B*\operatorname{Log}[e*((a + b*x)/(c + d*x))^n]]^2)/(12*b^2*d^3)$



$$\frac{x/(c + dx)^n)^2/(4b^2) - (B^2*(b*c - a*d)^4*g^2*i*n^2*Log[c + dx])/(12*b^2*d^3) + (B^2*(b*c - a*d)^4*g^2*i*n^2*Log[-((d*(a + b*x))/(b*c - a*d))] * Log[c + dx])/(6*b^2*d^3) - (B*(b*c - a*d)^4*g^2*i*n*(A + B*Log[e*((a + b*x)/(c + dx))^n]) * Log[c + dx])/(6*b^2*d^3) - (B^2*(b*c - a*d)^4*g^2*i*n^2 * Log[c + dx]^2)/(12*b^2*d^3) + (B^2*(b*c - a*d)^4*g^2*i*n^2 * PolyLog[2, (b*(c + dx))/(b*c - a*d)])/(6*b^2*d^3)$$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_.))^(p_.)*((c_.) + (d_.)*(x_.))^(q_.))
^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)
^q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

### Rule 31

```
Int[((a_) + (b_.)*(x_.))^(n_.), x_Symbol] := Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

### Rule 43

```
Int[((a_.) + (b_.)*(x_.))^(m_.)*((c_.) + (d_.)*(x_.))^(n_.), x_Symbol] := Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
```

$x]$  && NeQ[b\*c - a\*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && LeQ[7\*m + 4\*n + 4, 0]) || LtQ[9\*m + 5\*(n + 1), 0] || GtQ[m + n + 2, 0])

### Rule 2524

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^n)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

### Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*(RFx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]

### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]/(x\_), x\_Symbol] := -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.)\*(x\_))^(q\_.), x\_Symbol] := Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\begin{aligned}
\int (160c + 160dx)(ag + bgx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx &= \int \left[ \frac{160(bc - ad)(ag + bgx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b} + \dots \right] \\
&= \frac{(160(bc - ad)) \int (ag + bgx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx}{b} \\
&= \frac{160(bc - ad)g^2(a + bx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3b^2} + \frac{40dg}{b} \\
&= \frac{160(bc - ad)g^2(a + bx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3b^2} + \frac{40dg}{b} \\
&= \frac{160(bc - ad)g^2(a + bx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3b^2} + \frac{40dg}{b} \\
&= \frac{160(bc - ad)g^2(a + bx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3b^2} + \frac{40dg}{b} \\
&= \frac{80AB(bc - ad)^3 g^2 n x}{3bd^2} - \frac{40B(bc - ad)^2 g^2 n (a + bx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3b^2 d} \\
&= \frac{80AB(bc - ad)^3 g^2 n x}{3bd^2} + \frac{80B^2(bc - ad)^3 g^2 n (a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{3b^2 d^2} \\
&= \frac{80AB(bc - ad)^3 g^2 n x}{3bd^2} + \frac{80B^2(bc - ad)^3 g^2 n (a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{3b^2 d^2} \\
&= \frac{80AB(bc - ad)^3 g^2 n x}{3bd^2} - \frac{40B^2(bc - ad)^3 g^2 n^2 x}{3bd^2} + \frac{40B^2(bc - ad)^3 g^2 n^2 x}{3bd^2} \\
&= \frac{80AB(bc - ad)^3 g^2 n x}{3bd^2} - \frac{40B^2(bc - ad)^3 g^2 n^2 x}{3bd^2} + \frac{40B^2(bc - ad)^3 g^2 n^2 x}{3bd^2} \\
&= \frac{80AB(bc - ad)^3 g^2 n x}{3bd^2} - \frac{40B^2(bc - ad)^3 g^2 n^2 x}{3bd^2} + \frac{40B^2(bc - ad)^3 g^2 n^2 x}{3bd^2}
\end{aligned}$$

**Mathematica [A]** time = 0.57614, size = 716, normalized size = 1.47

$$g^2 i \left( \frac{4Bn(bc-ad)^2 \left( Bn(bc-ad)^2 \left( 2 \operatorname{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right) + \log(c+dx) \left( 2 \log \left( \frac{d(a+bx)}{ad-bc} \right) - \log(c+dx) \right) \right) - d^2(a+bx)^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right) - 2(bc-ad)^2 \log(c+dx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{d^3} \right)$$

Antiderivative was successfully verified.

[In] Integrate[(a\*g + b\*g\*x)^2\*(c\*i + d\*i\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2,x]

[Out] (g^2\*i\*(4\*(b\*c - a\*d)\*(a + b\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2 + 3\*d\*(a + b\*x)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2 + (4\*B\*(b\*c - a\*d)^2\*n\*(2\*A\*b\*d\*(b\*c - a\*d)\*x + 2\*B\*d\*(b\*c - a\*d)\*(a + b\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n] - d^2\*(a + b\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 2\*B\*(b\*c - a\*d)^2\*n\*Log[c + d\*x] - 2\*(b\*c - a\*d)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[c + d\*x] + B\*(b\*c - a\*d)\*n\*(b\*d\*x + (-b\*c) + a\*d)\*Log[c + d\*x]) + B\*(b\*c - a\*d)^2\*n\*((2\*Log[(d\*(a + b\*x))/(-b\*c) + a\*d]) - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])))/d^3 - (B\*(b\*c - a\*d)\*n\*(6\*A\*b\*d\*(b\*c - a\*d)^2\*x + 6\*B\*d\*(b\*c - a\*d)^2\*(a + b\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n] + 3\*d^2\*(-b\*c) + a\*d)\*(a + b\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 2\*d^3\*(a + b\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 6\*B\*(b\*c - a\*d)^3\*n\*Log[c + d\*x] - 6\*(b\*c - a\*d)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[c + d\*x] + B\*(b\*c - a\*d)\*n\*(2\*b\*d\*(b\*c - a\*d)\*x - d^2\*(a + b\*x)^2 - 2\*(b\*c - a\*d)^2\*Log[c + d\*x]) + 3\*B\*(b\*c - a\*d)^2\*n\*(b\*d\*x + (-b\*c) + a\*d)\*Log[c + d\*x]) + 3\*B\*(b\*c - a\*d)^3\*n\*((2\*Log[(d\*(a + b\*x))/(-b\*c) + a\*d]) - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])))/d^3))/(12\*b^2)

**Maple [F]** time = 0.517, size = 0, normalized size = 0.

$$\int (bgx + ag)^2 (dix + ci) \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2,x)

[Out] int((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2,x)

**Maxima [B]** time = 3.54552, size = 3633, normalized size = 7.46

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, a
lgorithm="maxima")
```

```
[Out] 1/2*A*B*b^2*d*g^2*i*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/4*A^2*b^
2*d*g^2*i*x^4 + 2/3*A*B*b^2*c*g^2*i*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))
^n) + 4/3*A*B*a*b*d*g^2*i*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/3*
A^2*b^2*c*g^2*i*x^3 + 2/3*A^2*a*b*d*g^2*i*x^3 + 2*A*B*a*b*c*g^2*i*x^2*log(e
*(b*x/(d*x + c) + a/(d*x + c))^n) + A*B*a^2*d*g^2*i*x^2*log(e*(b*x/(d*x + c
) + a/(d*x + c))^n) + A^2*a*b*c*g^2*i*x^2 + 1/2*A^2*a^2*d*g^2*i*x^2 - 1/12*
A*B*b^2*d*g^2*i*x*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^
3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3
*d^3)*x)/(b^3*d^3)) + 1/3*A*B*b^2*c*g^2*i*x*(2*a^3*log(b*x + a)/b^3 - 2*c^3
*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^
2*d^2)) + 2/3*A*B*a*b*d*g^2*i*x*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c
)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 2*
A*B*a*b*c*g^2*i*x*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d
)*x/(b*d)) - A*B*a^2*d*g^2*i*x*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2
+ (b*c - a*d)*x/(b*d)) + 2*A*B*a^2*c*g^2*i*x*(a*log(b*x + a)/b - c*log(d*x
+ c)/d) + 2*A*B*a^2*c*g^2*i*x*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2
*a^2*c*g^2*i*x - 1/12*(2*a^3*c*d^3*g^2*i*x^2 + (g^2*i*x^2 + 2*g^2*i*x*log(e
))*b^3*c^4 - 2*(g^2*i*x^2 + 4*g^2*i*x*log(e))*a*b^2*c^3*d - (g^2*i*x^2 - 12
*g^2*i*x*log(e))*a^2*b*c^2*d^2)*B^2*log(d*x + c)/(b*d^3) - 1/6*(b^4*c^4*g^2
*i*x^2 - 4*a*b^3*c^3*d*g^2*i*x^2 + 6*a^2*b^2*c^2*d^2*g^2*i*x^2 - 4*a^3*b*c*
d^3*g^2*i*x^2 + a^4*d^4*g^2*i*x^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a
*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^2*d^3) + 1/12*(3*B^2*b
^4*d^4*g^2*i*x^4*log(e)^2 - 2*((g^2*i*x*log(e) - 2*g^2*i*log(e)^2)*b^4*c*d^
3 - (g^2*i*x*log(e) + 4*g^2*i*log(e)^2)*a*b^3*d^4)*B^2*x^3 + ((g^2*i*x^2 -
g^2*i*x*log(e))*b^4*c^2*d^2 - 2*(g^2*i*x^2 + 2*g^2*i*x*log(e) - 6*g^2*i*log
(e)^2)*a*b^3*c*d^3 + (g^2*i*x^2 + 5*g^2*i*x*log(e) + 6*g^2*i*log(e)^2)*a^2*
b^2*d^4)*B^2*x^2 - (4*a^3*b*c*d^3*g^2*i*x^2 - a^4*d^4*g^2*i*x^2)*B^2*log(b*
x + a)^2 + 2*(b^4*c^4*g^2*i*x^2 - 4*a*b^3*c^3*d*g^2*i*x^2 + 6*a^2*b^2*c^2*d
^2*g^2*i*x^2)*B^2*log(b*x + a)*log(d*x + c) - (b^4*c^4*g^2*i*x^2 - 4*a*b^3*
c^3*d*g^2*i*x^2 + 6*a^2*b^2*c^2*d^2*g^2*i*x^2)*B^2*log(d*x + c)^2 - ((g^2*i
*x^2 - 2*g^2*i*x*log(e))*b^4*c^3*d - (5*g^2*i*x^2 - 8*g^2*i*x*log(e))*a*b^3
*c^2*d^2 + (7*g^2*i*x^2 - 4*g^2*i*x*log(e) - 12*g^2*i*log(e)^2)*a^2*b^2*c*d
^3 - (3*g^2*i*x^2 + 2*g^2*i*x*log(e))*a^3*b*d^4)*B^2*x + (2*a*b^3*c^3*d*g^2
*i*x^2 - 7*a^2*b^2*c^2*d^2*g^2*i*x^2 + 2*(3*g^2*i*x^2 + 4*g^2*i*x*log(e))*a
```

$$\begin{aligned}
&^3*b*c*d^3 - (g^{2*i*n^2} + 2*g^{2*i*n*log(e)})*a^4*d^4)*B^2*log(b*x + a) + (3* \\
&B^2*b^4*d^4*g^{2*i*x^4} + 12*B^2*a^2*b^2*c*d^3*g^{2*i*x} + 4*(b^4*c*d^3*g^{2*i} + \\
&2*a*b^3*d^4*g^{2*i})*B^2*x^3 + 6*(2*a*b^3*c*d^3*g^{2*i} + a^2*b^2*d^4*g^{2*i})*B \\
&^2*x^2)*log((b*x + a)^n)^2 + (3*B^2*b^4*d^4*g^{2*i*x^4} + 12*B^2*a^2*b^2*c*d^ \\
&3*g^{2*i*x} + 4*(b^4*c*d^3*g^{2*i} + 2*a*b^3*d^4*g^{2*i})*B^2*x^3 + 6*(2*a*b^3*c* \\
&d^3*g^{2*i} + a^2*b^2*d^4*g^{2*i})*B^2*x^2)*log((d*x + c)^n)^2 + (6*B^2*b^4*d^4 \\
&*g^{2*i*x^4*log(e)} - 2*((g^{2*i*n} - 4*g^{2*i*log(e)})*b^4*c*d^3 - (g^{2*i*n} + 8* \\
&g^{2*i*log(e)})*a*b^3*d^4)*B^2*x^3 - (b^4*c^2*d^2*g^{2*i*n} + 4*(g^{2*i*n} - 6*g^ \\
&2*i*log(e))*a*b^3*c*d^3 - (5*g^{2*i*n} + 12*g^{2*i*log(e)})*a^2*b^2*d^4)*B^2*x^ \\
&2 + 2*(b^4*c^3*d*g^{2*i*n} - 4*a*b^3*c^2*d^2*g^{2*i*n} + a^3*b*d^4*g^{2*i*n} + 2* \\
&(g^{2*i*n} + 6*g^{2*i*log(e)})*a^2*b^2*c*d^3)*B^2*x + 2*(4*a^3*b*c*d^3*g^{2*i*n} \\
&- a^4*d^4*g^{2*i*n})*B^2*log(b*x + a) - 2*(b^4*c^4*g^{2*i*n} - 4*a*b^3*c^3*d*g^ \\
&2*i*n + 6*a^2*b^2*c^2*d^2*g^{2*i*n})*B^2*log(d*x + c))*log((b*x + a)^n) - (6* \\
&B^2*b^4*d^4*g^{2*i*x^4*log(e)} - 2*((g^{2*i*n} - 4*g^{2*i*log(e)})*b^4*c*d^3 - (g \\
&^2*i*n + 8*g^{2*i*log(e)})*a*b^3*d^4)*B^2*x^3 - (b^4*c^2*d^2*g^{2*i*n} + 4*(g^2 \\
&*i*n - 6*g^{2*i*log(e)})*a*b^3*c*d^3 - (5*g^{2*i*n} + 12*g^{2*i*log(e)})*a^2*b^2* \\
&d^4)*B^2*x^2 + 2*(b^4*c^3*d*g^{2*i*n} - 4*a*b^3*c^2*d^2*g^{2*i*n} + a^3*b*d^4*g \\
&^2*i*n + 2*(g^{2*i*n} + 6*g^{2*i*log(e)})*a^2*b^2*c*d^3)*B^2*x + 2*(4*a^3*b*c*d \\
&^3*g^{2*i*n} - a^4*d^4*g^{2*i*n})*B^2*log(b*x + a) - 2*(b^4*c^4*g^{2*i*n} - 4*a*b \\
&^3*c^3*d*g^{2*i*n} + 6*a^2*b^2*c^2*d^2*g^{2*i*n})*B^2*log(d*x + c) + 2*(3*B^2*b \\
&^4*d^4*g^{2*i*x^4} + 12*B^2*a^2*b^2*c*d^3*g^{2*i*x} + 4*(b^4*c*d^3*g^{2*i} + 2*a* \\
&b^3*d^4*g^{2*i})*B^2*x^3 + 6*(2*a*b^3*c*d^3*g^{2*i} + a^2*b^2*d^4*g^{2*i})*B^2*x^ \\
&2)*log((b*x + a)^n))*log((d*x + c)^n))/(b^2*d^3)
\end{aligned}$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( A^2 b^2 d g^2 i x^3 + A^2 a^2 c g^2 i + (A^2 b^2 c + 2 A^2 a b d) g^2 i x^2 + (2 A^2 a b c + A^2 a^2 d) g^2 i x + (B^2 b^2 d g^2 i x^3 + B^2 a^2 c g^2 i + (B^2
\right.$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2,x, algorithm="fricas")

[Out] integral(A^2\*b^2\*d\*g^2\*i\*x^3 + A^2\*a^2\*c\*g^2\*i + (A^2\*b^2\*c + 2\*A^2\*a\*b\*d)\*g^2\*i\*x^2 + (2\*A^2\*a\*b\*c + A^2\*a^2\*d)\*g^2\*i\*x + (B^2\*b^2\*d\*g^2\*i\*x^3 + B^2\*a^2\*c\*g^2\*i + (B^2\*b^2\*c + 2\*B^2\*a\*b\*d)\*g^2\*i\*x^2 + (2\*B^2\*a\*b\*c + B^2\*a^2\*d)\*g^2\*i\*x)\*log(e\*((b\*x + a)/(d\*x + c))^n)^2 + 2\*(A\*B\*b^2\*d\*g^2\*i\*x^3 + A\*B\*a^2\*c\*g^2\*i + (A\*B\*b^2\*c + 2\*A\*B\*a\*b\*d)\*g^2\*i\*x^2 + (2\*A\*B\*a\*b\*c + A\*B\*a^2\*d)\*g^2\*i\*x)\*log(e\*((b\*x + a)/(d\*x + c))^n), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*\*2\*(d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n))\*\*2,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int (bgx + ag)^2 (dix + ci) \left( B \log \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) + A \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2,x, algorithm="giac")

[Out] integrate((b\*g\*x + a\*g)^2\*(d\*i\*x + c\*i)\*(B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)^2, x)



$$3.161 \quad \int (ag + bgx)(ci + dix) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx$$

**Optimal.** Leaf size=372

$$\frac{B^2 g i n^2 (bc - ad)^3 \text{PolyLog} \left( 2, \frac{d(a+bx)}{b(c+dx)} \right)}{3b^2 d^2} - \frac{B g i n (bc - ad)^3 \log \left( \frac{bc-ad}{b(c+dx)} \right) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A + Bn \right)}{3b^2 d^2} - \frac{B g i n (a + bx)(bc - ad)}{3b^2 d^2}$$

[Out]  $(B^2*(b*c - a*d)^2*g*i*n^2*x)/(3*b*d) - (B*(b*c - a*d)^2*g*i*n*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b^2*d) - (B*(b*c - a*d)*g*i*n*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b^2) + ((b*c - a*d)*g*i*n*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(6*b^2) + (g*i*(a + b*x)^2*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(3*b) - (B*(b*c - a*d)^3*g*i*n*(A + B*n + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(3*b^2*d^2) - (B^2*(b*c - a*d)^3*g*i*n^2*Log[c + d*x])/(3*b^2*d^2) - (B^2*(b*c - a*d)^3*g*i*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(3*b^2*d^2)$

**Rubi [B]** time = 2.87827, antiderivative size = 1323, normalized size of antiderivative = 3.56, number of steps used = 72, number of rules used = 14, integrand size = 41,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.342$ , Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 2486, 31, 72}

$$-\frac{B^2 d g i n^2 \log^2(a + bx) a^3}{3b^2} + \frac{2B d g i n \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) a^3}{3b^2} + \frac{2B^2 d g i n^2 \log(a + bx) \log \left( \frac{b(c+dx)}{bc-ad} \right) a^3}{3b^2} + \dots$$

Antiderivative was successfully verified.

[In] Int[(a\*g + b\*g\*x)\*(c\*i + d\*i\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2,x]

[Out]  $(-2*A*b*B*(a^2/b^2 - c^2/d^2)*d*g*i*n*x)/3 - (A*B*(b*c - a*d)*(b*c + a*d)*g*i*n*x)/(b*d) + (B^2*(b*c - a*d)^2*g*i*n^2*x)/(3*b*d) + (a^2*B^2*(b*c - a*d)*g*i*n^2*Log[a + b*x])/(3*b^2) - (a^2*B^2*c*g*i*n^2*Log[a + b*x]^2)/b - (a^3*B^2*d*g*i*n^2*Log[a + b*x]^2)/(3*b^2) + (a^2*B^2*(b*c + a*d)*g*i*n^2*Log[a + b*x]^2)/(2*b^2) - (B^2*(b*c - a*d)*(b*c + a*d)*g*i*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(3*b^2*d) - (B*(b*c - a*d)*g*i*n*x^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/3 + (2*a^2*B*c*g*i*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/b + (2*a^3*B*d*g*i*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b^2) - (a^2*B*(b*c + a*d)*g*i*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b^2)$

$$\begin{aligned}
& + B \cdot \text{Log}\left[\frac{e^{\left(\frac{a + b \cdot x}{c + d \cdot x}\right)^n}}{b^2 + a \cdot c \cdot g^{i \cdot x} \cdot (A + B \cdot \text{Log}\left[\frac{e^{\left(\frac{a + b \cdot x}{c + d \cdot x}\right)^n}}{(b \cdot c + a \cdot d) \cdot g^{i \cdot x^2} \cdot (A + B \cdot \text{Log}\left[\frac{e^{\left(\frac{a + b \cdot x}{c + d \cdot x}\right)^n}\right]^2)}\right])^2}\right]}{2} + (b \cdot d \cdot g^{i \cdot x^3} \cdot (A + B \cdot \text{Log}\left[\frac{e^{\left(\frac{a + b \cdot x}{c + d \cdot x}\right)^n}\right]^2)}\right) / 3 - (B^2 \cdot c^2 \cdot (b \cdot c - a \cdot d) \cdot g^{i \cdot n^2} \cdot \text{Log}[c + d \cdot x]) / (3 \cdot d^2) + (B^2 \cdot (b \cdot c - a \cdot d)^2 \cdot (b \cdot c + a \cdot d) \cdot g^{i \cdot n^2} \cdot \text{Log}[c + d \cdot x]) / (3 \cdot b^2 \cdot d^2) + (2 \cdot b \cdot B^2 \cdot c^3 \cdot g^{i \cdot n^2} \cdot \text{Log}\left[-\left(\frac{d \cdot (a + b \cdot x)}{b \cdot c - a \cdot d}\right)\right] \cdot \text{Log}[c + d \cdot x]) / (3 \cdot d^2) + (2 \cdot a \cdot B^2 \cdot c^2 \cdot g^{i \cdot n^2} \cdot \text{Log}\left[-\left(\frac{d \cdot (a + b \cdot x)}{b \cdot c - a \cdot d}\right)\right] \cdot \text{Log}[c + d \cdot x]) / d - (B^2 \cdot c^2 \cdot (b \cdot c + a \cdot d) \cdot g^{i \cdot n^2} \cdot \text{Log}\left[-\left(\frac{d \cdot (a + b \cdot x)}{b \cdot c - a \cdot d}\right)\right] \cdot \text{Log}[c + d \cdot x]) / d^2 - (2 \cdot b \cdot B \cdot c^3 \cdot g^{i \cdot n} \cdot (A + B \cdot \text{Log}\left[\frac{e^{\left(\frac{a + b \cdot x}{c + d \cdot x}\right)^n}\right] \cdot \text{Log}[c + d \cdot x]) / (3 \cdot d^2) - (2 \cdot a \cdot B \cdot c^2 \cdot g^{i \cdot n} \cdot (A + B \cdot \text{Log}\left[\frac{e^{\left(\frac{a + b \cdot x}{c + d \cdot x}\right)^n}\right] \cdot \text{Log}[c + d \cdot x]) / d + (B \cdot c^2 \cdot (b \cdot c + a \cdot d) \cdot g^{i \cdot n} \cdot (A + B \cdot \text{Log}\left[\frac{e^{\left(\frac{a + b \cdot x}{c + d \cdot x}\right)^n}\right] \cdot \text{Log}[c + d \cdot x]) / d^2 - (b \cdot B^2 \cdot c^3 \cdot g^{i \cdot n^2} \cdot \text{Log}[c + d \cdot x]^2) / (3 \cdot d^2) - (a \cdot B^2 \cdot c^2 \cdot g^{i \cdot n^2} \cdot \text{Log}[c + d \cdot x]^2) / d + (B^2 \cdot c^2 \cdot (b \cdot c + a \cdot d) \cdot g^{i \cdot n^2} \cdot \text{Log}[c + d \cdot x]^2) / (2 \cdot d^2) + (2 \cdot a^2 \cdot B^2 \cdot c \cdot g^{i \cdot n^2} \cdot \text{Log}[a + b \cdot x] \cdot \text{Log}\left[\frac{b \cdot (c + d \cdot x)}{b \cdot c - a \cdot d}\right]) / b + (2 \cdot a^3 \cdot B^2 \cdot d \cdot g^{i \cdot n^2} \cdot \text{Log}[a + b \cdot x] \cdot \text{Log}\left[\frac{b \cdot (c + d \cdot x)}{b \cdot c - a \cdot d}\right]) / (3 \cdot b^2) - (a^2 \cdot B^2 \cdot (b \cdot c + a \cdot d) \cdot g^{i \cdot n^2} \cdot \text{Log}[a + b \cdot x] \cdot \text{Log}\left[\frac{b \cdot (c + d \cdot x)}{b \cdot c - a \cdot d}\right]) / b^2 + (2 \cdot a^2 \cdot B^2 \cdot c \cdot g^{i \cdot n^2} \cdot \text{PolyLog}[2, -\left(\frac{d \cdot (a + b \cdot x)}{b \cdot c - a \cdot d}\right)]) / b + (2 \cdot a^3 \cdot B^2 \cdot d \cdot g^{i \cdot n^2} \cdot \text{PolyLog}[2, -\left(\frac{d \cdot (a + b \cdot x)}{b \cdot c - a \cdot d}\right)]) / (3 \cdot b^2) - (a^2 \cdot B^2 \cdot (b \cdot c + a \cdot d) \cdot g^{i \cdot n^2} \cdot \text{PolyLog}[2, -\left(\frac{d \cdot (a + b \cdot x)}{b \cdot c - a \cdot d}\right)]) / b^2 + (2 \cdot b \cdot B^2 \cdot c^3 \cdot g^{i \cdot n^2} \cdot \text{PolyLog}[2, \frac{b \cdot (c + d \cdot x)}{b \cdot c - a \cdot d}]) / (3 \cdot d^2) + (2 \cdot a \cdot B^2 \cdot c^2 \cdot g^{i \cdot n^2} \cdot \text{PolyLog}[2, \frac{b \cdot (c + d \cdot x)}{b \cdot c - a \cdot d}]) / d - (B^2 \cdot c^2 \cdot (b \cdot c + a \cdot d) \cdot g^{i \cdot n^2} \cdot \text{PolyLog}[2, \frac{b \cdot (c + d \cdot x)}{b \cdot c - a \cdot d}]) / d^2
\end{aligned}$$

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]
] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

```

### Rule 2523

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] := Simp[x*(a +
b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

```

### Rule 12

```

Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]

```

### Rule 2524

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S

```

```

ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

```

### Rule 2418

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^p*(RFx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]

```

### Rule 2390

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^p*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]

```

### Rule 2301

```

Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]

```

### Rule 2394

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]

```

### Rule 2393

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]

```

### Rule 2391

```

Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]

```

### Rule 2525

```

Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

```

### Rule 2486

```

Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.)]^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]

```

### Rule 31

```

Int[((a_) + (b_.)*(x_))^(n_), x_Symbol] :> Simp[Log[RemoveContent[a + b*x, x]]/b, x] /; FreeQ[{a, b}, x]

```

### Rule 72

```

Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]

```

### Rubi steps

$$\begin{aligned}
\int (161c + 161dx)(ag + bgx) \left( A + B \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) \right)^2 dx &= \int \left( 161acg \left( A + B \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) \right)^2 + 161(bc + ad)gx \right. \\
&= (161acg) \int \left( A + B \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) \right)^2 dx + (161bdg) \int \\
&= 161acgx \left( A + B \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) \right)^2 + \frac{161}{2}(bc + ad)gx^2 \left( A + B \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) \right)^2 \\
&= 161acgx \left( A + B \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) \right)^2 + \frac{161}{2}(bc + ad)gx^2 \left( A + B \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) \right)^2 \\
&= 161acgx \left( A + B \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) \right)^2 + \frac{161}{2}(bc + ad)gx^2 \left( A + B \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) \right)^2 \\
&= 161acgx \left( A + B \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) \right)^2 + \frac{161}{2}(bc + ad)gx^2 \left( A + B \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) \right)^2 \\
&= -\frac{161AB(bc - ad)(bc + ad)gnx}{3bd} - \frac{161}{3}B(bc - ad)gnx^2 \left( A + B \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) \right)^2 \\
&= -\frac{161AB(bc - ad)(bc + ad)gnx}{3bd} - \frac{161B^2(bc - ad)(bc + ad)gnx^2}{3bd} \left( A + B \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) \right)^2 \\
&= -\frac{161AB(bc - ad)(bc + ad)gnx}{3bd} - \frac{161B^2(bc - ad)(bc + ad)gnx^2}{3bd} \left( A + B \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) \right)^2 \\
&= -\frac{161AB(bc - ad)(bc + ad)gnx}{3bd} + \frac{161B^2(bc - ad)^2gn^2x}{3bd} \left( A + B \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) \right)^2 \\
&= -\frac{161AB(bc - ad)(bc + ad)gnx}{3bd} + \frac{161B^2(bc - ad)^2gn^2x}{3bd} \left( A + B \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) \right)^2 \\
&= -\frac{161AB(bc - ad)(bc + ad)gnx}{3bd} + \frac{161B^2(bc - ad)^2gn^2x}{3bd} \left( A + B \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) \right)^2
\end{aligned}$$

**Mathematica [B]** time = 0.72591, size = 937, normalized size = 2.52

$$gi \left( 2b^3 B n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) \log(c+dx) c^3 - b^3 B^2 n^2 \left( \left( 2 \log \left( \frac{d(a+bx)}{ad-bc} \right) - \log(c+dx) \right) \log(c+dx) + 2 \text{PolyLog} \left( 2, \frac{b(c+dx)}{bc} \right) \right) \right)$$

Antiderivative was successfully verified.

[In] Integrate[(a\*g + b\*g\*x)\*(c\*i + d\*i\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2,x]

[Out] (g\*i\*(-6\*A\*b^2\*B\*c\*d\*(b\*c - a\*d)\*n\*x + 6\*a\*A\*b\*B\*d^2\*(-(b\*c) + a\*d)\*n\*x + 4\*A\*b\*B\*d\*(b\*c - a\*d)\*(b\*c + a\*d)\*n\*x - 6\*b\*B^2\*c\*d\*(b\*c - a\*d)\*n\*(a + b\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n] + 6\*a\*B^2\*d^2\*(-(b\*c) + a\*d)\*n\*(a + b\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n] + 4\*B^2\*d\*(b\*c - a\*d)\*(b\*c + a\*d)\*n\*(a + b\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n] - 2\*b^2\*B\*d^2\*(b\*c - a\*d)\*n\*x^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 6\*a^2\*b\*B\*c\*d^2\*n\*Log[a + b\*x]\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 2\*a^3\*B\*d^3\*n\*Log[a + b\*x]\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 6\*a\*b^2\*c\*d^2\*x\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2 + 3\*b^2\*d^2\*(b\*c + a\*d)\*x^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2 + 2\*b^3\*d^3\*x^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2 + 6\*b\*B^2\*c\*(b\*c - a\*d)^2\*n^2\*Log[c + d\*x] + 6\*a\*B^2\*d\*(b\*c - a\*d)^2\*n^2\*Log[c + d\*x] - 4\*B^2\*(b\*c - a\*d)^2\*(b\*c + a\*d)\*n^2\*Log[c + d\*x] + 2\*b^3\*B\*c^3\*n\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[c + d\*x] - 6\*a\*b^2\*B\*c^2\*d\*n\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[c + d\*x] + 2\*B^2\*(b\*c - a\*d)\*n^2\*(a^2\*d^2\*Log[a + b\*x] - b\*(d\*(-(b\*c) + a\*d)\*x + b\*c^2\*Log[c + d\*x])) - 3\*a^2\*b\*B^2\*c\*d^2\*n^2\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d])) - 2\*PolyLog[2, (d\*(a + b\*x))/(-(b\*c) + a\*d)]) + a^3\*B^2\*d^3\*n^2\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d])) - 2\*PolyLog[2, (d\*(a + b\*x))/(-(b\*c) + a\*d)]) - b^3\*B^2\*c^3\*n^2\*((2\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)] - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)]) + 3\*a\*b^2\*B^2\*c^2\*d\*n^2\*((2\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)] - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])))/(6\*b^2\*d^2)

**Maple [F]** time = 0.335, size = 0, normalized size = 0.

$$\int (bgx + ag)(dix + ci) \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2,x)

```
[Out] int((b*g*x+a*g)*(d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

---

**Maxima [B]** time = 3.62435, size = 2082, normalized size = 5.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, alg
orithm="maxima")
```

```
[Out] 2/3*A*B*b*d*g*i*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/3*A^2*b*d*g*
i*x^3 + A*B*b*c*g*i*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*B*a*d*g*
i*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/2*A^2*b*c*g*i*x^2 + 1/2*A^
2*a*d*g*i*x^2 + 1/3*A*B*b*d*g*i*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x +
c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) -
A*B*b*c*g*i*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/
(b*d)) - A*B*a*d*g*i*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c
- a*d)*x/(b*d)) + 2*A*B*a*c*g*i*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + 2
*A*B*a*c*g*i*x*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*a*c*g*i*x - 1/3
*(a^2*c*d^2*g*i*n^2 - b^2*c^3*g*i*n*log(e) - (g*i*n^2 - 3*g*i*n*log(e))*a*b
*c^2*d)*B^2*log(d*x + c)/(b*d^2) + 1/3*(b^3*c^3*g*i*n^2 - 3*a*b^2*c^2*d*g*
i*n^2 + 3*a^2*b*c*d^2*g*i*n^2 - a^3*d^3*g*i*n^2)*(log(b*x + a)*log((b*d*x +
a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^2*d^2) +
1/6*(2*B^2*b^3*d^3*g*i*x^3*log(e)^2 - ((2*g*i*n*log(e) - 3*g*i*log(e)^2)*b^
3*c*d^2 - (2*g*i*n*log(e) + 3*g*i*log(e)^2)*a*b^2*d^3)*B^2*x^2 - (3*a^2*b*c
*d^2*g*i*n^2 - a^3*d^3*g*i*n^2)*B^2*log(b*x + a)^2 - 2*(b^3*c^3*g*i*n^2 - 3
*a*b^2*c^2*d*g*i*n^2)*B^2*log(b*x + a)*log(d*x + c) + (b^3*c^3*g*i*n^2 - 3*
a*b^2*c^2*d*g*i*n^2)*B^2*log(d*x + c)^2 + 2*((g*i*n^2 - g*i*n*log(e))*b^3*c
^2*d - (2*g*i*n^2 - 3*g*i*log(e)^2)*a*b^2*c*d^2 + (g*i*n^2 + g*i*n*log(e))*
a^2*b*d^3)*B^2*x - 2*(a*b^2*c^2*d*g*i*n^2 + a^3*d^3*g*i*n*log(e) - (g*i*n^2
+ 3*g*i*n*log(e))*a^2*b*c*d^2)*B^2*log(b*x + a) + (2*B^2*b^3*d^3*g*i*x^3 +
6*B^2*a*b^2*c*d^2*g*i*x + 3*(b^3*c*d^2*g*i + a*b^2*d^3*g*i)*B^2*x^2)*log((
b*x + a)^n)^2 + (2*B^2*b^3*d^3*g*i*x^3 + 6*B^2*a*b^2*c*d^2*g*i*x + 3*(b^3*c
*d^2*g*i + a*b^2*d^3*g*i)*B^2*x^2)*log((d*x + c)^n)^2 + 2*(2*B^2*b^3*d^3*g*
i*x^3*log(e) - ((g*i*n - 3*g*i*log(e))*b^3*c*d^2 - (g*i*n + 3*g*i*log(e))*a
*b^2*d^3)*B^2*x^2 - (b^3*c^2*d*g*i*n - a^2*b*d^3*g*i*n - 6*a*b^2*c*d^2*g*i*
log(e))*B^2*x + (3*a^2*b*c*d^2*g*i*n - a^3*d^3*g*i*n)*B^2*log(b*x + a) + (b
^3*c^3*g*i*n - 3*a*b^2*c^2*d*g*i*n)*B^2*log(d*x + c))*log((b*x + a)^n) - 2*
(2*B^2*b^3*d^3*g*i*x^3*log(e) - ((g*i*n - 3*g*i*log(e))*b^3*c*d^2 - (g*i*n
+ 3*g*i*log(e))*a*b^2*d^3)*B^2*x^2 - (b^3*c^2*d*g*i*n - a^2*b*d^3*g*i*n - 6
*a*b^2*c*d^2*g*i*log(e))*B^2*x + (3*a^2*b*c*d^2*g*i*n - a^3*d^3*g*i*n)*B^2*
```

$\log(bx + a) + (b^3c^3g^{i*n} - 3ab^2c^2d^2g^{i*n})B^2\log(dx + c) + (2B^2b^3d^3g^{i*x^3} + 6B^2ab^2c^2d^2g^{i*x} + 3(b^3c^2d^2g^{i} + ab^2d^3g^{i})B^2x^2)\log((bx + a)^n)\log((dx + c)^n)/(b^2d^2)$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

integral  $\left( A^2bdgix^2 + A^2acgi + (A^2bc + A^2ad)gix + (B^2bdgix^2 + B^2acgi + (B^2bc + B^2ad)gix) \log\left( e\left( \frac{bx+a}{dx+c} \right)^n \right)^2 + 2(A$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2,x, algorithm="fricas")

[Out] integral(A^2\*b\*d\*g^{i\*x^2} + A^2\*a\*c\*g^{i} + (A^2\*b\*c + A^2\*a\*d)\*g^{i\*x} + (B^2\*b\*d\*g^{i\*x^2} + B^2\*a\*c\*g^{i} + (B^2\*b\*c + B^2\*a\*d)\*g^{i\*x})\*log(e\*((b\*x + a)/(d\*x + c))^n)^2 + 2\*(A\*B\*b\*d\*g^{i\*x^2} + A\*B\*a\*c\*g^{i} + (A\*B\*b\*c + A\*B\*a\*d)\*g^{i\*x})\*log(e\*((b\*x + a)/(d\*x + c))^n), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int (bgx + ag)(dix + ci) \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.



```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(d*i*x + c*i)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2, x)
```

$$3.162 \quad \int (ci + dix) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx$$

**Optimal.** Leaf size=220

$$\frac{B^2 i n^2 (bc - ad)^2 \text{PolyLog} \left( 2, \frac{b(c+dx)}{d(a+bx)} \right)}{b^2 d} + \frac{\text{Bin}(bc - ad)^2 \log \left( 1 - \frac{b(c+dx)}{d(a+bx)} \right) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{b^2 d} - \frac{\text{Bin}(a + bx)(bc - ad)}{b}$$

[Out]  $-\left(\left(B*(b*c - a*d)*i*n*(a + b*x)*(A + B*\text{Log}\left[e*\left(\frac{a + b*x}{c + d*x}\right)^n\right]\right)\right)/b^2$   
 $+ (i*(c + d*x)^2*(A + B*\text{Log}\left[e*\left(\frac{a + b*x}{c + d*x}\right)^n\right])^2/(2*d) + (B^2*(b*c - a*d)^2*i*n^2*\text{Log}[c + d*x])/(b^2*d) + (B*(b*c - a*d)^2*i*n*(A + B*\text{Log}\left[e*\left(\frac{a + b*x}{c + d*x}\right)^n\right]*\text{Log}\left[1 - (b*(c + d*x))/(d*(a + b*x))\right])/(b^2*d) - (B^2*(b*c - a*d)^2*i*n^2*\text{PolyLog}[2, (b*(c + d*x))/(d*(a + b*x))])/(b^2*d)$

**Rubi [A]** time = 0.480723, antiderivative size = 307, normalized size of antiderivative = 1.4, number of steps used = 15, number of rules used = 12, integrand size = 33,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.364$ , Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2 i n^2 (bc - ad)^2 \text{PolyLog} \left( 2, -\frac{d(a+bx)}{bc-ad} \right)}{b^2 d} - \frac{\text{Bin}(bc - ad)^2 \log(a + bx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{b^2 d} + \frac{i(c + dx)^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{2d}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[(c*i + d*i*x)*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2, x]$

[Out]  $-\left(\left(A*B*(b*c - a*d)*i*n*x\right)\right)/b + (B^2*(b*c - a*d)^2*i*n^2*\text{Log}[a + b*x]^2)/(2*b^2*d) - (B^2*(b*c - a*d)*i*n*(a + b*x)*\text{Log}\left[e*\left(\frac{a + b*x}{c + d*x}\right)^n\right])/b^2$   
 $- (B*(b*c - a*d)^2*i*n*\text{Log}[a + b*x]*(A + B*\text{Log}\left[e*\left(\frac{a + b*x}{c + d*x}\right)^n\right]))/(b^2*d) + (i*(c + d*x)^2*(A + B*\text{Log}\left[e*\left(\frac{a + b*x}{c + d*x}\right)^n\right])^2/(2*d)$   
 $+ (B^2*(b*c - a*d)^2*i*n^2*\text{Log}[c + d*x])/(b^2*d) - (B^2*(b*c - a*d)^2*i*n^2*\text{Log}[a + b*x]*\text{Log}\left[\frac{b*(c + d*x)}{b*c - a*d}\right])/(b^2*d) - (B^2*(b*c - a*d)^2*i*n^2*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))])/(b^2*d)$

**Rule 2525**

$\text{Int}[\left(\left(a_{.}\right) + \text{Log}\left[\left(c_{.}\right)*\left(\text{RFx}_{.}\right)^{\left(p_{.}\right)}\right]*\left(b_{.}\right)\right)^{\left(n_{.}\right)}*\left(\left(d_{.}\right) + \left(e_{.}\right)*\left(x_{.}\right)\right)^{\left(m_{.}\right)}, x\_Symbol] \rightarrow \text{Simp}\left[\left(\left(d + e*x\right)^{\left(m + 1\right)}*\left(a + b*\text{Log}\left[c*\text{RFx}^p\right]\right)^n\right)/\left(e^{\left(m + 1\right)}\right), x\right] - \text{Dist}\left[\left(b*n*p\right)/\left(e^{\left(m + 1\right)}\right), \text{Int}\left[\text{SimplifyIntegrand}\left[\left(\left(d + e*x\right)^{\left(m + 1\right)}*\left(a + b*\text{Log}\left[c*\text{RFx}^p\right]\right)^{\left(n - 1\right)}*D\left[\text{RFx}, x\right]\right)/\text{RFx}, x\right], x\right] /;$  FreeQ[{a, b, c, d

, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

### Rule 12

Int[(a\_)\*(u\_), x\_Symbol] :=> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b\_)\*(v\_)] /; FreeQ[b, x]

### Rule 2528

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*(RGx\_), x\_Symbol] :=> With[{u = ExpandIntegrand[(a + b\*Log[c\*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

### Rule 2486

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.), x\_Symbol] :=> Simp[((a + b\*x)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/b, x] + Dist[(q\*r\*s\*(b\*c - a\*d))/b, Int[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s - 1)/(c + d\*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]

### Rule 31

Int[((a\_) + (b\_.)\*(x\_))^(n\_), x\_Symbol] :=> Simp[Log[RemoveContent[a + b\*x, x]]/b, x] /; FreeQ[{a, b}, x]

### Rule 2524

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] :=> Simp[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^n)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

### Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_.) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*(RFx\_), x\_Symbol] :=> With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rubi steps

$$\begin{aligned}
\int (162c + 162dx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx &= \frac{81(c+dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{d} - \frac{(Bn) \int \frac{26244(bc-ad)(c+dx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{162d}}{162d} \\
&= \frac{81(c+dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{d} - \frac{(162B(bc-ad)n) \int \frac{(c+dx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{d}}{d} \\
&= \frac{81(c+dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{d} - \frac{(162B(bc-ad)n) \int \left( \frac{d \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{d} \right)}{d} \\
&= \frac{81(c+dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{d} - \frac{(162B(bc-ad)n) \int \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b} \\
&= -\frac{162AB(bc-ad)nx}{b} - \frac{162B(bc-ad)^2n \log(a+bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2d} \\
&= -\frac{162AB(bc-ad)nx}{b} - \frac{162B^2(bc-ad)n(a+bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^2} - 1 \\
&= -\frac{162AB(bc-ad)nx}{b} - \frac{162B^2(bc-ad)n(a+bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^2} - 1 \\
&= -\frac{162AB(bc-ad)nx}{b} - \frac{162B^2(bc-ad)n(a+bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^2} - 1 \\
&= -\frac{162AB(bc-ad)nx}{b} + \frac{81B^2(bc-ad)^2n^2 \log^2(a+bx)}{b^2d} - \frac{162B^2(bc-ad)^2n^2 \log^2(a+bx)}{b^2d} \\
&= -\frac{162AB(bc-ad)nx}{b} + \frac{81B^2(bc-ad)^2n^2 \log^2(a+bx)}{b^2d} - \frac{162B^2(bc-ad)^2n^2 \log^2(a+bx)}{b^2d}
\end{aligned}$$

**Mathematica [A]** time = 0.211707, size = 216, normalized size = 0.98

$$i \left( \frac{Bn(bc-ad) \left( 2Bn(ad-bc) \text{PolyLog} \left( 2, \frac{d(a+bx)}{ad-bc} \right) - 2(bc-ad) \log(a+bx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + Bn \log \left( \frac{b(c+dx)}{bc-ad} \right) + A \right) - 2 \left( Bd(a+bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + Bn(ad-bc) \log(c+dx) \right)}{b^2} \right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] (i*((c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (B*(b*c - a*d)*n
*(B*(b*c - a*d)*n*Log[a + b*x]^2 - 2*(A*b*d*x + B*d*(a + b*x)*Log[e*((a + b
*x)/(c + d*x))^n] + B*(-(b*c) + a*d)*n*Log[c + d*x]) - 2*(b*c - a*d)*Log[a
+ b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n] + B*n*Log[(b*(c + d*x))/(b*c -
a*d)]) + 2*B*(-(b*c) + a*d)*n*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]))/b
^2)/(2*d)
```

**Maple [F]** time = 0.324, size = 0, normalized size = 0.

$$\int (dix + ci) \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

**Maxima [B]** time = 3.5242, size = 1114, normalized size = 5.06

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="maxi
ma")
```

```
[Out] A*B*d*i*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/2*A^2*d*i*x^2 - A*B*
d*i*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) +
2*A*B*c*i*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + 2*A*B*c*i*x*log(e*(b*x
/(d*x + c) + a/(d*x + c))^n) + A^2*c*i*x - (a*c*d*i*n^2 - (i*n^2 - i*n*log(
e))*b*c^2)*B^2*log(d*x + c)/(b*d) - (b^2*c^2*i*n^2 - 2*a*b*c*d*i*n^2 + a^2*
d^2*i*n^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x
+ a*d)/(b*c - a*d)))*B^2/(b^2*d) + 1/2*(2*B^2*b^2*c^2*i*n^2*log(b*x + a)*l
og(d*x + c) - B^2*b^2*c^2*i*n^2*log(d*x + c)^2 + B^2*b^2*d^2*i*x^2*log(e)^2
```

$$\begin{aligned}
& - (2*a*b*c*d*i*n^2 - a^2*d^2*i*n^2)*B^2*\log(b*x + a)^2 + 2*(a*b*d^2*i*n*\log(e) - (i*n*\log(e) - i*\log(e)^2)*b^2*c*d)*B^2*x - 2*((i*n^2 - 2*i*n*\log(e))*a*b*c*d - (i*n^2 - i*n*\log(e))*a^2*d^2)*B^2*\log(b*x + a) + (B^2*b^2*d^2*i*x^2 + 2*B^2*b^2*c*d*i*x)*\log((b*x + a)^n)^2 + (B^2*b^2*d^2*i*x^2 + 2*B^2*b^2*c*d*i*x)*\log((d*x + c)^n)^2 + 2*(B^2*b^2*d^2*i*x^2*\log(e) - B^2*b^2*c^2*i*n*\log(d*x + c) + (a*b*d^2*i*n - (i*n - 2*i*\log(e))*b^2*c*d)*B^2*x + (2*a*b*c*d*i*n - a^2*d^2*i*n)*B^2*\log(b*x + a))*\log((b*x + a)^n) - 2*(B^2*b^2*d^2*i*x^2*\log(e) - B^2*b^2*c^2*i*n*\log(d*x + c) + (a*b*d^2*i*n - (i*n - 2*i*\log(e))*b^2*c*d)*B^2*x + (2*a*b*c*d*i*n - a^2*d^2*i*n)*B^2*\log(b*x + a) + (B^2*b^2*d^2*i*x^2 + 2*B^2*b^2*c*d*i*x)*\log((b*x + a)^n))*\log((d*x + c)^n)/(b^2*d)
\end{aligned}$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2dix + A^2ci + (B^2dix + B^2ci)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2(ABdix + ABci)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2,x, algorithm="fricas")

[Out] integral(A^2\*d\*i\*x + A^2\*c\*i + (B^2\*d\*i\*x + B^2\*c\*i)\*log(e\*((b\*x + a)/(d\*x + c))^n)^2 + 2\*(A\*B\*d\*i\*x + A\*B\*c\*i)\*log(e\*((b\*x + a)/(d\*x + c))^n), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int (dx + ci) \left( B \log \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) + A \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2, x)
```



$$3.163 \quad \int \frac{(ci+dx) \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{ag+bgx} dx$$

**Optimal.** Leaf size=306

$$\frac{2Bin(bc-ad)PolyLog\left(2, \frac{b(c+dx)}{d(a+bx)}\right) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{b^2g} + \frac{2B^2in^2(bc-ad)PolyLog\left(2, \frac{d(a+bx)}{b(c+dx)}\right)}{b^2g} + \frac{2B^2in^2(bc-ad)P}{b}$$

[Out] (d\*i\*(a + b\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(b^2\*g) + (2\*B\*(b\*c - a\*d)\*i\*n\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[(b\*c - a\*d)/(b\*(c + d\*x))])/(b^2\*g) - ((b\*c - a\*d)\*i\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2\*Log[1 - (b\*(c + d\*x))/(d\*(a + b\*x))])/(b^2\*g) + (2\*B^2\*(b\*c - a\*d)\*i\*n^2\*PolyLog[2, (d\*(a + b\*x))/(b\*(c + d\*x))])/(b^2\*g) + (2\*B\*(b\*c - a\*d)\*i\*n\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*PolyLog[2, (b\*(c + d\*x))/(d\*(a + b\*x))])/(b^2\*g) + (2\*B^2\*(b\*c - a\*d)\*i\*n^2\*PolyLog[3, (b\*(c + d\*x))/(d\*(a + b\*x))])/(b^2\*g)

**Rubi [B]** time = 2.87409, antiderivative size = 692, normalized size of antiderivative = 2.26, number of steps used = 36, number of rules used = 19, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.442$ , Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610}

$$\frac{2ABin(bc-ad)PolyLog\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{b^2g} + \frac{2B^2in(bc-ad)PolyLog\left(2, \frac{bc-ad}{d(a+bx)} + 1\right) \log\left(e \left( \frac{a+bx}{c+dx} \right)^n\right)}{b^2g} + \frac{2aB^2din^2PolyLog\left(2, \frac{d(a+bx)}{bc-ad}\right)}{b^2g}$$

Antiderivative was successfully verified.

[In] Int[((c\*i + d\*i\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(a\*g + b\*g\*x), x]

[Out] -((A\*B\*(b\*c - a\*d)\*i\*n\*Log[a + b\*x]^2)/(b^2\*g)) - (a\*B^2\*d\*i\*n^2\*Log[a + b\*x]^2)/(b^2\*g) - (B^2\*(b\*c - a\*d)\*i\*Log[-((b\*c - a\*d)/(d\*(a + b\*x))])\*Log[e\*((a + b\*x)/(c + d\*x))^n]^2)/(b^2\*g) - (B^2\*(b\*c - a\*d)\*i\*Log[a + b\*x]\*Log[e\*((a + b\*x)/(c + d\*x))^n]^2)/(b^2\*g) + (2\*a\*B\*d\*i\*n\*Log[a + b\*x]\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])/(b^2\*g) + (d\*i\*x\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(b\*g) + ((b\*c - a\*d)\*i\*Log[a + b\*x]\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(b^2\*g) + (2\*B^2\*c\*i\*n^2\*Log[-((d\*(a + b\*x))/(b\*c - a\*d))]\*Log[c + d\*x])/(b\*g) - (2\*B\*c\*i\*n\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Lo

$$g[c + d*x])/(b*g) - (B^2*c*i*n^2*\text{Log}[c + d*x]^2)/(b*g) + (2*A*B*(b*c - a*d) * i*n*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)]/(b^2*g) + (2*a*B^2*d*i*n^2*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)]/(b^2*g) + (2*A*B*(b*c - a*d) * i*n*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]/(b^2*g) + (2*a*B^2*d*i*n^2*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]/(b^2*g) + (2*B^2*c*i*n^2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]/(b*g) + (2*B^2*(b*c - a*d)*i*n*\text{Log}[e*((a + b*x)/(c + d*x))^n]*\text{PolyLog}[2, 1 + (b*c - a*d)/(d*(a + b*x))]/(b^2*g) + (2*B^2*(b*c - a*d)*i*n^2*\text{PolyLog}[3, 1 + (b*c - a*d)/(d*(a + b*x))]/(b^2*g)$$
Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]
] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] := Simp[x*(a +
b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]
```

Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.)\*(x\_))^(q\_.), x\_Symbol] := Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] := Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n]))/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] := -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rule 6688

Int[u\_, x\_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifyIntegrandQ[v, u, x]]

### Rule 6742

Int[u\_, x\_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]

### Rule 2411

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_.) + (g\_.)\*(x\_))^(q\_.)\*((h\_.) + (i\_.)\*(x\_))^(r\_.), x\_Symbol] := Dist[1/e, Subst[Int[((g\*x)/e)^q\*((e\*h - d\*i)/e + (i\*x)/e)^r\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e\*f - d

\*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2\*r]

### Rule 2344

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/((x\_)\*((d\_) + (e\_.)\*(x\_))),  
x\_Symbol] := Dist[1/d, Int[(a + b\*Log[c\*x^n])^p/x, x], x] - Dist[e/d, Int[(a + b\*Log[c\*x^n])^p/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

### Rule 2317

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/((d\_) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^p)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

### Rule 2507

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.)\*Log[(i\_.)\*((j\_.)\*((g\_.) + (h\_.)\*(x\_))^(t\_.))^(u\_.)]\*(v\_), x\_Symbol] := With[{k = Simplify[v\*(a + b\*x)\*(c + d\*x)]}, Simp[(k\*Log[i\*(j\*(g + h\*x)^t]^u)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/(p\*r\*(s + 1)\*(b\*c - a\*d)), x] - Dist[(k\*h\*t\*u)/(p\*r\*(s + 1)\*(b\*c - a\*d)), Int[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s/(g + h\*x), x], x] /; FreeQ[k, x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && NeQ[s, -1]

### Rule 2488

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.)/((g\_.) + (h\_.)\*(x\_)), x\_Symbol] := -Simp[(Log[-(b\*c - a\*d)/(d\*(a + b\*x))])\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s/h, x] + Dist[(p\*r\*s\*(b\*c - a\*d)/h, Int[(Log[-(b\*c - a\*d)/(d\*(a + b\*x))])\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && EqQ[b\*g - a\*h, 0] && IGtQ[s, 0]

### Rule 2506

Int[Log[v\_]\*Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.)\*(u\_), x\_Symbol] := With[{g = Simplify[((v - 1)\*(c + d\*x))/(a + b\*x)], h = Simplify[u\*(a + b\*x)\*(c + d\*x)]}, -Simp[(h\*PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/(b\*c - a\*d), x] + Dist[h\*p\*r\*s, Int[(PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f

, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]

### Rule 6610

Int[(u\_)\*PolyLog[n\_, v\_], x\_Symbol] :=> With[{w = DerivativeDivides[v, u\*v, x]}, Simp[w\*PolyLog[n + 1, v], x] /; !FalseQ[w]] /; FreeQ[n, x]

### Rubi steps

$$\begin{aligned}
\int \frac{(163c + 163dx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{ag + bgx} dx &= \int \left( \frac{163d \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{bg} + \frac{163(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{bg(a + bx)} \right) dx \\
&= \frac{(163d) \int \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx}{bg} + \frac{(163(bc - ad)) \int \frac{\left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{a+bx} dx}{bg} \\
&= \frac{163dx \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{bg} + \frac{163(bc - ad) \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g} \\
&= \frac{163dx \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{bg} + \frac{163(bc - ad) \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g} \\
&= \frac{163dx \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{bg} + \frac{163(bc - ad) \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g} \\
&= \frac{163dx \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{bg} + \frac{163(bc - ad) \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g} \\
&= \frac{326ABdn \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g} + \frac{163dx \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{bg} \\
&= -\frac{163B^2(bc - ad) \log(a + bx) \log^2 \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^2g} + \frac{326ABdn \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g} \\
&= -\frac{163B^2(bc - ad) \log \left( -\frac{bc-ad}{d(a+bx)} \right) \log^2 \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^2g} - \frac{163B^2(bc - ad) \log(a + bx) \log^2 \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^2g} \\
&= -\frac{163AB(bc - ad)n \log^2(a + bx)}{b^2g} - \frac{163B^2(bc - ad) \log \left( -\frac{bc-ad}{d(a+bx)} \right) \log^2 \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^2g} \\
&= -\frac{163AB(bc - ad)n \log^2(a + bx)}{b^2g} - \frac{163aB^2dn^2 \log^2(a + bx)}{b^2g} - \frac{163B^2(bc - ad) \log \left( -\frac{bc-ad}{d(a+bx)} \right) \log^2 \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^2g} \\
&= -\frac{163AB(bc - ad)n \log^2(a + bx)}{b^2g} - \frac{163aB^2dn^2 \log^2(a + bx)}{b^2g} - \frac{163B^2(bc - ad) \log \left( -\frac{bc-ad}{d(a+bx)} \right) \log^2 \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^2g}
\end{aligned}$$

**Mathematica [B]** time = 1.86057, size = 742, normalized size = 2.42

$$i \left( -3Bn \left( -2ad \operatorname{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right) + 2 \left( \log \left( \frac{c}{d} + x \right) \left( -ad \log \left( \frac{d(a+bx)}{ad-bc} \right) + ad \log(a+bx) + bc \right) + (ad \log(a+bx) - bdx) \right) \right)$$

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(a\*g + b\*g\*x), x]

[Out] (i\*(3\*b\*d\*x\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n] - B\*n\*Log[(a + b\*x)/(c + d\*x)])^2 + 3\*(b\*c - a\*d)\*Log[a + b\*x]\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n] - B\*n\*Log[(a + b\*x)/(c + d\*x)])^2 - 3\*B\*n\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n] - B\*n\*Log[(a + b\*x)/(c + d\*x)])\*(a\*d\*Log[a/b + x]^2 - 2\*a\*d\*Log[a/b + x]\*(1 + Log[a + b\*x]) + 2\*(-(b\*c) + a\*d + Log[c/d + x]\*(b\*c + a\*d\*Log[a + b\*x] - a\*d\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)])) + (-(b\*d\*x) + a\*d\*Log[a + b\*x])\*Log[(a + b\*x)/(c + d\*x)] - 2\*a\*d\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)] + 3\*b\*B\*c\*n\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n] - B\*n\*Log[(a + b\*x)/(c + d\*x)])\*(Log[a/b + x]^2 - 2\*Log[a + b\*x]\*(Log[a/b + x] - Log[c/d + x] - Log[(a + b\*x)/(c + d\*x)]) - 2\*(Log[c/d + x]\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)] + PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])) + B^2\*n^2\*(Log[(a + b\*x)/(c + d\*x)])\*(-(a\*d\*Log[(a + b\*x)/(c + d\*x)]^2 + 6\*(b\*c - a\*d)\*Log[(b\*c - a\*d)/(b\*c + b\*d\*x]) + 3\*d\*Log[(a + b\*x)/(c + d\*x)]\*(a + b\*x + a\*Log[(b\*c - a\*d)/(b\*c + b\*d\*x]))) + 6\*(b\*c - a\*d + a\*d\*Log[(a + b\*x)/(c + d\*x)])\*PolyLog[2, (d\*(a + b\*x))/(b\*(c + d\*x))] - 6\*a\*d\*PolyLog[3, (d\*(a + b\*x))/(b\*(c + d\*x))] - 3\*b\*B^2\*c\*n^2\*(Log[(-(b\*c) + a\*d)/(d\*(a + b\*x))]\*Log[(a + b\*x)/(c + d\*x)]^2 - 2\*Log[(a + b\*x)/(c + d\*x)]\*PolyLog[2, (b\*(c + d\*x))/(d\*(a + b\*x))] - 2\*PolyLog[3, (b\*(c + d\*x))/(d\*(a + b\*x))]))/(3\*b^2\*g)

**Maple [F]** time = 0.527, size = 0, normalized size = 0.

$$\int \frac{dix + ci}{bgx + ag} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g), x)

[Out] int((d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g), x)

---

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$A^2 di \left( \frac{x}{bg} - \frac{a \log(bx + a)}{b^2 g} \right) + \frac{A^2 ci \log(bgx + ag)}{bg} + \frac{(B^2 bdix + (bci - adi)B^2 \log(bx + a)) \log((dx + c)^n)^2}{b^2 g} - \int - \frac{B^2 b^2 c^2 i}{b^2 g}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g),x, algorithm="maxima")

[Out] A^2\*d\*i\*(x/(b\*g) - a\*log(b\*x + a)/(b^2\*g)) + A^2\*c\*i\*log(b\*g\*x + a\*g)/(b\*g) + (B^2\*b\*d\*i\*x + (b\*c\*i - a\*d\*i)\*B^2\*log(b\*x + a))\*log((d\*x + c)^n)^2/(b^2\*g) - integrate(-(B^2\*b^2\*c^2\*i\*log(e)^2 + 2\*A\*B\*b^2\*c^2\*i\*log(e) + (B^2\*b^2\*d^2\*i\*log(e)^2 + 2\*A\*B\*b^2\*d^2\*i\*log(e))\*x^2 + (B^2\*b^2\*d^2\*i\*x^2 + 2\*B^2\*b^2\*c\*d\*i\*x + B^2\*b^2\*c^2\*i)\*log((b\*x + a)^n)^2 + 2\*(B^2\*b^2\*c\*d\*i\*log(e)^2 + 2\*A\*B\*b^2\*c\*d\*i\*log(e))\*x + 2\*(B^2\*b^2\*c^2\*i\*log(e) + A\*B\*b^2\*c^2\*i + (B^2\*b^2\*d^2\*i\*log(e) + A\*B\*b^2\*d^2\*i))\*x^2 + 2\*(B^2\*b^2\*c\*d\*i\*log(e) + A\*B\*b^2\*c\*d\*i)\*x)\*log((b\*x + a)^n) - 2\*(B^2\*b^2\*c^2\*i\*log(e) + A\*B\*b^2\*c^2\*i + (i\*n + i\*log(e))\*B^2\*b^2\*d^2 + A\*B\*b^2\*d^2\*i))\*x^2 + (2\*A\*B\*b^2\*c\*d\*i + (a\*b\*d^2\*i\*n + 2\*b^2\*c\*d\*i\*log(e))\*B^2)\*x + ((b^2\*c\*d\*i\*n - a\*b\*d^2\*i\*n)\*B^2\*x + (a\*b\*c\*d\*i\*n - a^2\*d^2\*i\*n)\*B^2)\*log(b\*x + a) + (B^2\*b^2\*d^2\*i\*x^2 + 2\*B^2\*b^2\*c\*d\*i\*x + B^2\*b^2\*c^2\*i)\*log((b\*x + a)^n))\*log((d\*x + c)^n))/(b^3\*d\*g\*x^2 + a\*b^2\*c\*g + (b^3\*c\*g + a\*b^2\*d\*g)\*x), x)

---

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{A^2 dix + A^2 ci + (B^2 dix + B^2 ci) \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right)^2 + 2 (ABdix + ABci) \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right)}{bgx + ag}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g),x, algorithm="fricas")

[Out] integral((A^2\*d\*i\*x + A^2\*c\*i + (B^2\*d\*i\*x + B^2\*c\*i)\*log(e\*((b\*x + a)/(d\*x + c))^n))^2 + 2\*(A\*B\*d\*i\*x + A\*B\*c\*i)\*log(e\*((b\*x + a)/(d\*x + c))^n))/(b\*g\*



$x + a*g), x)$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n))\*\*2/(b\*g\*x+a\*g),x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci) \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2}{bgx + ag} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g),x, algorithm="giac")

[Out] integrate((d\*i\*x + c\*i)\*(B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)^2/(b\*g\*x + a\*g), x)

$$3.164 \quad \int \frac{(ci+dx) \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ag+bgx)^2} dx$$

**Optimal.** Leaf size=261

$$\frac{2BdinPolyLog \left( 2, \frac{b(c+dx)}{d(a+bx)} \right) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{b^2g^2} + \frac{2B^2din^2PolyLog \left( 3, \frac{b(c+dx)}{d(a+bx)} \right)}{b^2g^2} - \frac{di \log \left( 1 - \frac{b(c+dx)}{d(a+bx)} \right) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g^2}$$

[Out]  $(-2*B^2*i*n^2*(c + d*x))/(b*g^2*(a + b*x)) - (2*B*i*n*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b*g^2*(a + b*x)) - (i*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(b*g^2*(a + b*x)) - (d*i*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^2*g^2) + (2*B*d*i*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^2*g^2) + (2*B^2*d*i*n^2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])/(b^2*g^2)$

**Rubi [B]** time = 2.94537, antiderivative size = 766, normalized size of antiderivative = 2.93, number of steps used = 40, number of rules used = 20, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.465$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610}

$$\frac{2ABdinPolyLog \left( 2, -\frac{d(a+bx)}{bc-ad} \right)}{b^2g^2} + \frac{2B^2dinPolyLog \left( 2, \frac{bc-ad}{d(a+bx)} + 1 \right) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^2g^2} - \frac{2B^2din^2PolyLog \left( 2, -\frac{d(a+bx)}{bc-ad} \right)}{b^2g^2} - \frac{2B^2din^2PolyLog \left( 2, \frac{bc-ad}{d(a+bx)} + 1 \right)}{b^2g^2}$$

Antiderivative was successfully verified.

[In] Int[((c\*i + d\*i\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(a\*g + b\*g\*x)^2,x]

[Out]  $(-2*B^2*(b*c - a*d)*i*n^2)/(b^2*g^2*(a + b*x)) - (2*B^2*d*i*n^2*Log[a + b*x])/(b^2*g^2) - (A*B*d*i*n*Log[a + b*x]^2)/(b^2*g^2) + (B^2*d*i*n^2*Log[a + b*x]^2)/(b^2*g^2) - (B^2*d*i*Log[-((b*c - a*d)/(d*(a + b*x))])*Log[e*((a + b*x)/(c + d*x))^n])^2)/(b^2*g^2) - (B^2*d*i*Log[a + b*x]*Log[e*((a + b*x)/(c + d*x))^n])^2)/(b^2*g^2) - (2*B*(b*c - a*d)*i*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^2*g^2*(a + b*x)) - (2*B*d*i*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^2*g^2) - ((b*c - a*d)*i*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(b^2*g^2*(a + b*x)) + (d*i*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(b^2*g^2) + (2*B^2*d*i*n^2*Log[c + d*x])/(b^2*g^2)$

$$\begin{aligned}
& - (2*B^2*d*i*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b^2*g^2) \\
& + (2*B*d*i*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(b^2*g^2) \\
& + (B^2*d*i*n^2*Log[c + d*x]^2)/(b^2*g^2) + (2*A*B*d*i*n*Log[a + b*x]*Log[ \\
& (b*(c + d*x))/(b*c - a*d)])/(b^2*g^2) - (2*B^2*d*i*n^2*Log[a + b*x]*Log[(b* \\
& (c + d*x))/(b*c - a*d)])/(b^2*g^2) + (2*A*B*d*i*n*PolyLog[2, -((d*(a + b*x) \\
& )/(b*c - a*d))])/(b^2*g^2) - (2*B^2*d*i*n^2*PolyLog[2, -((d*(a + b*x))/(b*c \\
& - a*d))])/(b^2*g^2) - (2*B^2*d*i*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] \\
& )/(b^2*g^2) + (2*B^2*d*i*n*Log[e*((a + b*x)/(c + d*x))^n]*PolyLog[2, 1 + (b \\
& *c - a*d)/(d*(a + b*x))])/(b^2*g^2) + (2*B^2*d*i*n^2*PolyLog[3, 1 + (b*c - \\
& a*d)/(d*(a + b*x))])/(b^2*g^2)
\end{aligned}$$

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFX^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFX, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]

```

### Rule 2525

```

Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFX^p])^n - 1)*D[RFX, x])/RFX, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]

```

### Rule 12

```

Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]

```

### Rule 44

```

Int[((a_) + (b_.)*(x_.))^(m_.)*((c_.) + (d_.)*(x_.))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])

```

### Rule 2524

```

Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_.)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFX^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x] /;

```

FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

#### Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*(RFx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n]^p, RFx, x]}, Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]

#### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.)\*(x\_))^(q\_.), x\_Symbol] := Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

#### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] := Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

#### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n]))/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

#### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

#### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] := -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

#### Rule 6688

Int[u\_, x\_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifyIntegrandQ[v, u, x]]

Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] := Dist[1/e, Subst[Int[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_Symbol] := Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol] := Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e, Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_Symbol] := With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g + h*x)^t]^u)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s + 1))/(p*r*(s + 1)*(b*c - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] := -Simp[(Log[-(b*c - a*d)/(d*(a + b*x))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/h, x] + Dist[(p*r*s*(b*c - a*d))/h, Int[(Log[-(b*c - a*d)/(d*(a + b*x))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
```

$d, e, f, g, h, p, q, r, s, x]$  && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && EqQ[b\*g - a\*h, 0] && IGtQ[s, 0]

### Rule 2506

Int[Log[v\_]\*Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_)^(q\_.))^(r\_.)]^(s\_.)\*(u\_), x\_Symbol] :> With[{g = Simplify[((v - 1)\*(c + d\*x))/(a + b\*x)], h = Simplify[u\*(a + b\*x)\*(c + d\*x)]}, -Simp[(h\*PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/(b\*c - a\*d), x] + Dist[h\*p\*r\*s, Int[(PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s - 1)/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]

### Rule 6610

Int[(u\_)\*PolyLog[n\_, v\_], x\_Symbol] :> With[{w = DerivativeDivides[v, u\*v, x]}, Simp[w\*PolyLog[n + 1, v], x] /; !FalseQ[w]] /; FreeQ[n, x]

### Rubi steps

$$\begin{aligned}
\int \frac{(164c + 164dx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ag + bgx)^2} dx &= \int \left( \frac{164(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{bg^2(a + bx)^2} + \frac{164d \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{bg^2(a + bx)} \right) dx \\
&= \frac{(164d) \int \frac{\left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{a+bx} dx}{bg^2} + \frac{(164(bc - ad)) \int \frac{\left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(a+bx)^2} dx}{bg^2} \\
&= -\frac{164(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2g^2(a + bx)} + \frac{164d \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2g^2} \\
&= -\frac{164(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2g^2(a + bx)} + \frac{164d \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2g^2} \\
&= -\frac{164(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2g^2(a + bx)} + \frac{164d \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2g^2} \\
&= -\frac{164(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2g^2(a + bx)} + \frac{164d \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2g^2} \\
&= -\frac{328B(bc - ad)n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g^2(a + bx)} - \frac{328Bdn \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g^2} \\
&= -\frac{164B^2d \log(a + bx) \log^2 \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^2g^2} - \frac{328B(bc - ad)n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g^2(a + bx)} \\
&= -\frac{164B^2d \log \left( -\frac{bc-ad}{d(a+bx)} \right) \log^2 \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^2g^2} - \frac{164B^2d \log(a + bx) \log^2 \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^2g^2} \\
&= -\frac{328B^2(bc - ad)n^2}{b^2g^2(a + bx)} - \frac{328B^2dn^2 \log(a + bx)}{b^2g^2} - \frac{164ABdn \log^2(a + bx)}{b^2g^2} \\
&= -\frac{328B^2(bc - ad)n^2}{b^2g^2(a + bx)} - \frac{328B^2dn^2 \log(a + bx)}{b^2g^2} - \frac{164ABdn \log^2(a + bx)}{b^2g^2} \\
&= -\frac{328B^2(bc - ad)n^2}{b^2g^2(a + bx)} - \frac{328B^2dn^2 \log(a + bx)}{b^2g^2} - \frac{164ABdn \log^2(a + bx)}{b^2g^2}
\end{aligned}$$

**Mathematica [B]** time = 3.55228, size = 1556, normalized size = 5.96

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x)^2,x]
```

```
[Out] (i*((-3*(b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2)/(a + b*x) + 3*d*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2 + (6*b*B*c*n*(-A - B*Log[e*((a + b*x)/(c + d*x))^n] + B*n*Log[(a + b*x)/(c + d*x)])*(-(d*(a + b*x)*Log[c/d + x]) + d*(a + b*x)*Log[(d*(a + b*x))/(-(b*c) + a*d)] + (b*c - a*d)*(1 + Log[(a + b*x)/(c + d*x)])))/((b*c - a*d)*(a + b*x)) + (3*b*B^2*c*n^2*(-2*b*c + 2*a*d - 2*d*(a + b*x)*Log[a + b*x] - 2*(b*c - a*d)*Log[(a + b*x)/(c + d*x)] - 2*d*(a + b*x)*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] - (b*c - a*d)*Log[(a + b*x)/(c + d*x)]^2 + 2*d*(a + b*x)*Log[c + d*x] - 2*d*(a + b*x)*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + d*(a + b*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + d*(a + b*x)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/((b*c - a*d)*(a + b*x)) + 3*B*d*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(Log[a/b + x]^2 - 2*Log[a/b + x]*Log[a + b*x] - 2*Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] + 2*Log[a + b*x]*((a*d)/(b*c - a*d) + Log[c/d + x] + Log[(a + b*x)/(c + d*x)]) + 2*a*((a + b*x)^(-1) + Log[(a + b*x)/(c + d*x)]/(a + b*x) + (d*Log[c + d*x])/(-(b*c) + a*d)) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + (B^2*d*n^2*(6*b*c - 6*a*d - (6*b^2*c*x)/(a + b*x) + (6*a*b*d*x)/(a + b*x) + 6*a*d*Log[a/b + x] + 3*b*c*Log[a/b + x]^2 - 3*a*d*Log[a/b + x]^2 - 6*b*c*Log[c/d + x] + 6*b*c*Log[a + b*x] - 6*a*d*Log[a + b*x] - 6*b*c*Log[a/b + x]*Log[a + b*x] + 6*a*d*Log[a/b + x]*Log[a + b*x] + 6*b*c*Log[c/d + x]*Log[a + b*x] - 6*a*d*Log[c/d + x]*Log[a + b*x] - 6*b*c*Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] + 6*a*d*Log[c/d + x]*Log[(d*(a + b*x))/(-(b*c) + a*d)] - (6*b*(b*c - a*d)*x*Log[(a + b*x)/(c + d*x)]/(a + b*x) + 6*b*c*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] - 6*a*d*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] + 3*a*d*Log[(a + b*x)/(c + d*x)]^2 + 3*b*d*x*Log[(a + b*x)/(c + d*x)]^2 - (3*b^2*x*(c + d*x)*Log[(a + b*x)/(c + d*x)]^2)/(a + b*x) - 3*b*c*Log[(-(b*c) + a*d)/(d*(a + b*x)])*Log[(a + b*x)/(c + d*x)]^2 - a*d*Log[(a + b*x)/(c + d*x)]^3 + 6*b*c*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] - 6*a*d*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + 3*a*d*Log[(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] + 6*(b*c - a*d + a*d*Log[(a + b*x)/(c + d*x)])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - 6*(b*c - a*d)*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] + 6*b*c*Log[(a + b*x)/(c + d
```



$x)]*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))] - 6*a*d*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))] + 6*b*c*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))]/(b*c - a*d))/(3*b^2*g^2)$

**Maple [F]** time = 0.554, size = 0, normalized size = 0.

$$\int \frac{dix + ci}{(bgx + ag)^2} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^2,x)

[Out] int((d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^2,x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^2,x, algorithm="maxima")

[Out]  $-2*A*B*c*i*n*(1/(b^2*g^2*x + a*b*g^2) + d*\log(b*x + a)/((b^2*c - a*b*d)*g^2) - d*\log(d*x + c)/((b^2*c - a*b*d)*g^2)) + A^2*d*i*(a/(b^3*g^2*x + a*b^2*g^2) + \log(b*x + a)/(b^2*g^2)) - 2*A*B*c*i*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^2*g^2*x + a*b*g^2) - A^2*c*i/(b^2*g^2*x + a*b*g^2) - ((b*c*i - a*d*i)*B^2 - (B^2*b*d*i*x + B^2*a*d*i)*\log(b*x + a))*\log((d*x + c)^n)^2/(b^3*g^2*x + a*b^2*g^2) - \text{integrate}(- (B^2*b^2*c^2*i*\log(e)^2 + (B^2*b^2*d^2*i*\log(e)^2 + 2*A*B*b^2*d^2*i*\log(e))*x^2 + (B^2*b^2*d^2*i*x^2 + 2*B^2*b^2*c*d*i*x + B^2*b^2*c^2*i)*\log((b*x + a)^n)^2 + 2*(B^2*b^2*c*d*i*\log(e)^2 + A*B*b^2*c*d*i*\log(e))*x + 2*(B^2*b^2*c^2*i*\log(e) + (B^2*b^2*d^2*i*\log(e) + A*B*b^2*d^2*i)*x^2 + (2*B^2*b^2*c*d*i*\log(e) + A*B*b^2*c*d*i)*x)*\log((b*x + a)^n) + 2*((a*b*c*d*i*n - a^2*d^2*i*n - b^2*c^2*i*\log(e))*B^2 - (B^2*b^2*d^2*i*\log(e) + A*B*b^2*d^2*i)*x^2 - (A*B*b^2*c*d*i + (a*b*d^2*i*n - (i*n - 2*i*\log(e))*b^2*c*d)*B^2)*x - (B^2*b^2*d^2*i*n*x^2 + 2*B^2*a*b*d^2*i*n*x + B^2*a^2*d^2*i*n)*\log(b*x + a) - (B^2*b^2*d^2*i*x^2 + 2*B^2*b^2*c*d*i*x + B^2*b^2*c^2*i)*\log((b*x + a)^n))*\log((d*x + c)^n))/(b^4*d*g^2*x^3 + a^2*b^2*c*g^2 +$

$(b^4*c*g^2 + 2*a*b^3*d*g^2)*x^2 + (2*a*b^3*c*g^2 + a^2*b^2*d*g^2)*x, x)$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{A^2dix + A^2ci + (B^2dix + B^2ci) \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right)^2 + 2(ABdix + ABci) \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right)}{b^2g^2x^2 + 2abg^2x + a^2g^2}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^2,x, algorithm="fricas")

[Out] integral((A^2\*d\*i\*x + A^2\*c\*i + (B^2\*d\*i\*x + B^2\*c\*i)\*log(e\*((b\*x + a)/(d\*x + c))^n))^2 + 2\*(A\*B\*d\*i\*x + A\*B\*c\*i)\*log(e\*((b\*x + a)/(d\*x + c))^n))/(b^2\*g^2\*x^2 + 2\*a\*b\*g^2\*x + a^2\*g^2), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^2,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci) \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2}{(bgx + ag)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x, algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(b*g*x + a*g)^2, x)
```

$$3.165 \quad \int \frac{(ci+dx) \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ag+bgx)^3} dx$$

**Optimal.** Leaf size=151

$$\frac{i(c+dx)^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)^2}{2g^3(a+bx)^2(bc-ad)} - \frac{Bin(c+dx)^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{2g^3(a+bx)^2(bc-ad)} - \frac{B^2in^2(c+dx)^2}{4g^3(a+bx)^2(bc-ad)}$$

[Out]  $-(B^2i^n(c+dx)^2)/(4(b^2c-ad)g^3(a+bx)^2) - (B^2in^2(c+dx)^2)/(2(b^2c-ad)g^3(a+bx)^2) - (i(c+dx)^2(A+B \log[e*((a+bx)/(c+dx))^n])^2)/(2(b^2c-ad)g^3(a+bx)^2)$

**Rubi [C]** time = 2.05542, antiderivative size = 691, normalized size of antiderivative = 4.58, number of steps used = 54, number of rules used = 11, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.256$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2d^2in^2 \text{PolyLog} \left( 2, -\frac{d(a+bx)}{bc-ad} \right)}{b^2g^3(bc-ad)} - \frac{B^2d^2in^2 \text{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right)}{b^2g^3(bc-ad)} - \frac{Bd^2in \log(a+bx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{b^2g^3(bc-ad)} + \frac{Bd^2in \log(a+bx)}{b^2g^3(bc-ad)}$$

Antiderivative was successfully verified.

[In] Int[((c\*i + d\*i\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(a\*g + b\*g\*x)^3, x]

[Out]  $-(B^2(b^2c-ad)i^n)/(4b^2g^3(a+bx)^2) - (B^2d^2i^n)/(2b^2g^3(a+bx)) - (B^2d^2i^n \text{Log}[a+bx])/(2b^2(b^2c-ad)g^3) + (B^2d^2i^n \text{Log}[a+bx]^2)/(2b^2(b^2c-ad)g^3) - (B(b^2c-ad)i^n(A+B \log[e*((a+bx)/(c+dx))^n]))/(2b^2g^3(a+bx)^2) - (Bd^2i^n(A+B \log[e*((a+bx)/(c+dx))^n])/(b^2g^3(a+bx)) - (Bd^2i^n \text{Log}[a+bx]*(A+B \log[e*((a+bx)/(c+dx))^n])/(b^2(b^2c-ad)g^3) - ((b^2c-ad)i^n(A+B \log[e*((a+bx)/(c+dx))^n])^2)/(2b^2g^3(a+bx)^2) - (d^2i^n(A+B \log[e*((a+bx)/(c+dx))^n])^2)/(b^2g^3(a+bx)) + (B^2d^2i^n \text{Log}[c+dx])/(2b^2(b^2c-ad)g^3) - (B^2d^2i^n \text{Log}[-((d*(a+bx))/(b^2c-ad))] \text{Log}[c+dx])/(b^2(b^2c-ad)g^3) + (Bd^2i^n(A+B \log[e*((a+bx)/(c+dx))^n]) \text{Log}[c+dx])/(b^2(b^2c-ad)g^3) + (B^2d^2i^n \text{Log}[c+dx]^2)/(2b^2(b^2c-ad)g^3) - (B^2d^2i^n \text{Log}[a+bx] \text{Log}[(b^2c-ad)/(b^2c-ad)])/(b^2(b^2c-ad)g^3) - (B^2d^2i^n \text{Log}[a+bx] \text{Log}[(b^2c-ad)/(b^2c-ad)])/(b^2(b^2c-ad)g^3) - (B^2d^2i^n \text{Log}[a+bx] \text{Log}[(b^2c-ad)/(b^2c-ad)])/(b^2(b^2c-ad)g^3)$

$$2*i*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))]/(b^2*(b*c - a*d)*g^3) - (B^2*d^2*i*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]/(b^2*(b*c - a*d)*g^3)$$
Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFX^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFX, x] && RationalFunc
tionQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFX^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFX_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFX, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFX, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x
), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}
\int \frac{(165c + 165dx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ag + bgx)^3} dx &= \int \left( \frac{165(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{bg^3(a + bx)^3} + \frac{165d \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{bg^3(a + bx)^2} \right) dx \\
&= \frac{(165d) \int \frac{\left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(a+bx)^2} dx}{bg^3} + \frac{(165(bc - ad)) \int \frac{\left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(a+bx)^3} dx}{bg^3} \\
&= -\frac{165(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{2b^2g^3(a + bx)^2} - \frac{165d \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2g^3(a + bx)} \\
&= -\frac{165(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{2b^2g^3(a + bx)^2} - \frac{165d \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2g^3(a + bx)} \\
&= -\frac{165(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{2b^2g^3(a + bx)^2} - \frac{165d \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2g^3(a + bx)} \\
&= -\frac{165(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{2b^2g^3(a + bx)^2} - \frac{165d \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2g^3(a + bx)} \\
&= -\frac{165B(bc - ad)n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{2b^2g^3(a + bx)^2} - \frac{165Bdn \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g^3(a + bx)} \\
&= -\frac{165B(bc - ad)n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{2b^2g^3(a + bx)^2} - \frac{165Bdn \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g^3(a + bx)} \\
&= -\frac{165B(bc - ad)n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{2b^2g^3(a + bx)^2} - \frac{165Bdn \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2g^3(a + bx)} \\
&= -\frac{165B^2(bc - ad)n^2}{4b^2g^3(a + bx)^2} - \frac{165B^2dn^2}{2b^2g^3(a + bx)} - \frac{165B^2d^2n^2 \log(a + bx)}{2b^2(bc - ad)g^3} - \frac{165B^2dn^2 \log(a + bx)}{2b^2g^3(a + bx)} \\
&= -\frac{165B^2(bc - ad)n^2}{4b^2g^3(a + bx)^2} - \frac{165B^2dn^2}{2b^2g^3(a + bx)} - \frac{165B^2d^2n^2 \log(a + bx)}{2b^2(bc - ad)g^3} + \frac{165B^2dn^2 \log(a + bx)}{2b^2g^3(a + bx)} \\
&= -\frac{165B^2(bc - ad)n^2}{4b^2g^3(a + bx)^2} - \frac{165B^2dn^2}{2b^2g^3(a + bx)} - \frac{165B^2d^2n^2 \log(a + bx)}{2b^2(bc - ad)g^3} + \frac{165B^2dn^2 \log(a + bx)}{2b^2g^3(a + bx)}
\end{aligned}$$

**Mathematica [C]** time = 0.927759, size = 801, normalized size = 5.3

$$i \left( 2(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 - 4d(ad - bc)(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 + 4Bdn(a + bx) \left( 2(bc - ad) \left( A + \right. \right.$$

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(a\*g + b\*g\*x)^3,x]

[Out] -(i\*(2\*(b\*c - a\*d)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2 - 4\*d\*(-(b\*c) + a\*d)\*(a + b\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2 + 4\*B\*d\*n\*(a + b\*x)\*(2\*(b\*c - a\*d)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 2\*d\*(a + b\*x)\*Log[a + b\*x]\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 2\*d\*(a + b\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[c + d\*x] + 2\*B\*n\*(b\*c - a\*d + d\*(a + b\*x))\*Log[a + b\*x] - d\*(a + b\*x)\*Log[c + d\*x]) - B\*d\*n\*(a + b\*x)\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]) - 2\*PolyLog[2, (d\*(a + b\*x))/(-(b\*c) + a\*d)]) + B\*d\*n\*(a + b\*x)\*((2\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)] - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])) + B\*n\*(2\*(b\*c - a\*d)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 4\*d\*(-(b\*c) + a\*d)\*(a + b\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 4\*d^2\*(a + b\*x)^2\*Log[a + b\*x]\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 4\*d^2\*(a + b\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[c + d\*x] - 4\*B\*d\*n\*(a + b\*x)\*(b\*c - a\*d + d\*(a + b\*x))\*Log[a + b\*x] - d\*(a + b\*x)\*Log[c + d\*x]) + B\*n\*((b\*c - a\*d)^2 + 2\*d\*(-(b\*c) + a\*d)\*(a + b\*x) - 2\*d^2\*(a + b\*x)^2\*Log[a + b\*x] + 2\*d^2\*(a + b\*x)^2\*Log[c + d\*x]) + 2\*B\*d^2\*n\*(a + b\*x)^2\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]) - 2\*PolyLog[2, (d\*(a + b\*x))/(-(b\*c) + a\*d)]) - 2\*B\*d^2\*n\*(a + b\*x)^2\*((2\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)] - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])))/(4\*b^2\*(b\*c - a\*d)\*g^3\*(a + b\*x)^2)

**Maple [F]** time = 0.527, size = 0, normalized size = 0.

$$\int \frac{dix + ci}{(bgx + ag)^3} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^3,x)



```
[Out] int((d*i*x+c*i)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x)
```

---

**Maxima [B]** time = 1.75431, size = 2723, normalized size = 18.03

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x, a
lgorithm="maxima")
```

```
[Out] -1/2*A*B*d*i*n*((3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*d)*x)/((b^5*c - a*b^4*d)
)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)*g^3) +
2*(2*b*c*d - a*d^2)*log(b*x + a)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3)
) - 2*(2*b*c*d - a*d^2)*log(d*x + c)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)
)*g^3)) + 1/2*A*B*c*i*n*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2
+ 2*(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + 2*d^2*log(b*
x + a)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3
*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3)) - 1/2*(2*b*x + a)*B^2*d*i*log(e*(b*x/
(d*x + c) + a/(d*x + c))^n)^2/(b^4*g^3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) +
1/4*(2*n*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c
- a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + 2*d^2*log(b*x + a)/((b^3*
c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a*b^
2*c*d + a^2*b*d^2)*g^3))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) - (b^2*c^2
- 8*a*b*c*d + 7*a^2*d^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x +
a)^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(d*x + c)^2 - 6*(b^2*c*d
- a*b*d^2)*x - 6*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a) + 2*(3
*b^2*d^2*x^2 + 6*a*b*d^2*x + 3*a^2*d^2 - 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2
*d^2)*log(b*x + a)*log(d*x + c))*n^2/(a^2*b^3*c^2*g^3 - 2*a^3*b^2*c*d*g^3
+ a^4*b*d^2*g^3 + (b^5*c^2*g^3 - 2*a*b^4*c*d*g^3 + a^2*b^3*d^2*g^3)*x^2 + 2
*(a*b^4*c^2*g^3 - 2*a^2*b^3*c*d*g^3 + a^3*b^2*d^2*g^3)*x))*B^2*c*i - 1/4*(2
*n*((3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*d)*x)/((b^5*c - a*b^4*d)*g^3*x^2 +
2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)*g^3) + 2*(2*b*c*d -
a*d^2)*log(b*x + a)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3) - 2*(2*b*c
*d - a*d^2)*log(d*x + c)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3))*log(e
*(b*x/(d*x + c) + a/(d*x + c))^n) + (7*a*b^2*c^2 - 8*a^2*b*c*d + a^3*d^2 -
2*(2*a^2*b*c*d - a^3*d^2 + (2*b^3*c*d - a*b^2*d^2)*x^2 + 2*(2*a*b^2*c*d - a
^2*b*d^2)*x)*log(b*x + a)^2 - 2*(2*a^2*b*c*d - a^3*d^2 + (2*b^3*c*d - a*b^2
*d^2)*x^2 + 2*(2*a*b^2*c*d - a^2*b*d^2)*x)*log(d*x + c)^2 + 2*(4*b^3*c^2 -
5*a*b^2*c*d + a^2*b*d^2)*x + 2*(4*a^2*b*c*d - a^3*d^2 + (4*b^3*c*d - a*b^2*
d^2)*x^2 + 2*(4*a*b^2*c*d - a^2*b*d^2)*x)*log(b*x + a) - 2*(4*a^2*b*c*d - a
^3*d^2 + (4*b^3*c*d - a*b^2*d^2)*x^2 + 2*(4*a*b^2*c*d - a^2*b*d^2)*x - 2*(2
```

$$\begin{aligned}
& a^2 b c d - a^3 d^2 + (2 b^3 c d - a b^2 d^2) x^2 + 2(2 a b^2 c d - a^2 b \\
& d^2) x \log(b x + a) \log(d x + c) n^2 / (a^2 b^4 c^2 g^3 - 2 a^3 b^3 c d g \\
& ^3 + a^4 b^2 d^2 g^3 + (b^6 c^2 g^3 - 2 a b^5 c d g^3 + a^2 b^4 d^2 g^3) x^2 \\
& + 2(a b^5 c^2 g^3 - 2 a^2 b^4 c d g^3 + a^3 b^3 d^2 g^3) x) B^2 d i - ( \\
& 2 b x + a) A B d i \log(e (b x / (d x + c) + a / (d x + c))^n) / (b^4 g^3 x^2 + 2 \\
& a b^3 g^3 x + a^2 b^2 g^3) - 1/2 B^2 c i \log(e (b x / (d x + c) + a / (d x + c) \\
& )^n)^2 / (b^3 g^3 x^2 + 2 a b^2 g^3 x + a^2 b g^3) - 1/2 (2 b x + a) A^2 d i / \\
& (b^4 g^3 x^2 + 2 a b^3 g^3 x + a^2 b^2 g^3) - A B c i \log(e (b x / (d x + c) \\
& + a / (d x + c))^n) / (b^3 g^3 x^2 + 2 a b^2 g^3 x + a^2 b g^3) - 1/2 A^2 c i / ( \\
& b^3 g^3 x^2 + 2 a b^2 g^3 x + a^2 b g^3)
\end{aligned}$$

**Fricas [B]** time = 0.533099, size = 1214, normalized size = 8.04

$$(B^2 b^2 c^2 - B^2 a^2 d^2) i n^2 + 2 (A B b^2 c^2 - A B a^2 d^2) i n + 2 (2 (B^2 b^2 c d - B^2 a b d^2) i x + (B^2 b^2 c^2 - B^2 a^2 d^2) i) \log(e)^2 + 2 (B^2 b^2 d^2$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^3,x, a  
lgorithm="fricas")

[Out] -1/4\*((B^2\*b^2\*c^2 - B^2\*a^2\*d^2)\*i\*n^2 + 2\*(A\*B\*b^2\*c^2 - A\*B\*a^2\*d^2)\*i\*n  
+ 2\*(2\*(B^2\*b^2\*c\*d - B^2\*a\*b\*d^2)\*i\*x + (B^2\*b^2\*c^2 - B^2\*a^2\*d^2)\*i)\*lo  
g(e)^2 + 2\*(B^2\*b^2\*d^2\*i\*n^2\*x^2 + 2\*B^2\*b^2\*c\*d\*i\*n^2\*x + B^2\*b^2\*c^2\*i\*n  
^2)\*log((b\*x + a)/(d\*x + c))^2 + 2\*(A^2\*b^2\*c^2 - A^2\*a^2\*d^2)\*i + 2\*((B^2\*  
b^2\*c\*d - B^2\*a\*b\*d^2)\*i\*n^2 + 2\*(A\*B\*b^2\*c\*d - A\*B\*a\*b\*d^2)\*i\*n + 2\*(A^2\*b  
^2\*c\*d - A^2\*a\*b\*d^2)\*i)\*x + 2\*((B^2\*b^2\*c^2 - B^2\*a^2\*d^2)\*i\*n + 2\*(A\*B\*b^  
2\*c^2 - A\*B\*a^2\*d^2)\*i + 2\*((B^2\*b^2\*c\*d - B^2\*a\*b\*d^2)\*i\*n + 2\*(A\*B\*b^2\*c\*  
d - A\*B\*a\*b\*d^2)\*i)\*x + 2\*(B^2\*b^2\*d^2\*i\*n\*x^2 + 2\*B^2\*b^2\*c\*d\*i\*n\*x + B^2\*  
b^2\*c^2\*i\*n)\*log((b\*x + a)/(d\*x + c))\*log(e) + 2\*(B^2\*b^2\*c^2\*i\*n^2 + 2\*A\*  
B\*b^2\*c^2\*i\*n + (B^2\*b^2\*d^2\*i\*n^2 + 2\*A\*B\*b^2\*d^2\*i\*n)\*x^2 + 2\*(B^2\*b^2\*c\*  
d\*i\*n^2 + 2\*A\*B\*b^2\*c\*d\*i\*n)\*x)\*log((b\*x + a)/(d\*x + c)))/((b^5\*c - a\*b^4\*d  
) \* g^3 \* x^2 + 2\*(a\*b^4\*c - a^2\*b^3\*d) \* g^3 \* x + (a^2\*b^3\*c - a^3\*b^2\*d) \* g^3)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n))\*\*2/(b\*g\*x+a\*g)\*\*3,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci) \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2}{(bgx + ag)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^3,x, algorithm="giac")

[Out] integrate((d\*i\*x + c\*i)\*(B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)^2/(b\*g\*x + a\*g)^3, x)

$$3.166 \quad \int \frac{(ci+dx) \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ag+bgx)^4} dx$$

**Optimal.** Leaf size=307

$$\frac{bi(c+dx)^3 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)^2}{3g^4(a+bx)^3(bc-ad)^2} - \frac{2bBin(c+dx)^3 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{9g^4(a+bx)^3(bc-ad)^2} + \frac{di(c+dx)^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)^2}{2g^4(a+bx)^2(bc-ad)^2}$$

[Out]  $(B^2*d*i*n^2*(c+d*x)^2)/(4*(b*c-a*d)^2*g^4*(a+b*x)^2) - (2*b*B^2*i*n^2*(c+d*x)^3)/(27*(b*c-a*d)^2*g^4*(a+b*x)^3) + (B*d*i*n*(c+d*x)^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(2*(b*c-a*d)^2*g^4*(a+b*x)^2) - (2*b*B*i*n*(c+d*x)^3*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(9*(b*c-a*d)^2*g^4*(a+b*x)^3) + (d*i*(c+d*x)^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))^2/(2*(b*c-a*d)^2*g^4*(a+b*x)^2) - (b*i*(c+d*x)^3*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))^2/(3*(b*c-a*d)^2*g^4*(a+b*x)^3)$

**Rubi [C]** time = 2.43164, antiderivative size = 800, normalized size of antiderivative = 2.61, number of steps used = 62, number of rules used = 11, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.256$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{B^2in^2 \log^2(a+bx)d^3}{6b^2(bc-ad)^2g^4} - \frac{B^2in^2 \log^2(c+dx)d^3}{6b^2(bc-ad)^2g^4} + \frac{5B^2in^2 \log(a+bx)d^3}{18b^2(bc-ad)^2g^4} + \frac{Bin \log(a+bx) \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) d^3}{3b^2(bc-ad)^2g^4} - 5$$

Antiderivative was successfully verified.

[In] Int[((c\*i + d\*i\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))^2/(a\*g + b\*g\*x)^4, x]

[Out]  $(-2*B^2*(b*c-a*d)*i*n^2)/(27*b^2*g^4*(a+b*x)^3) + (B^2*d*i*n^2)/(36*b^2*g^4*(a+b*x)^2) + (5*B^2*d^2*i*n^2)/(18*b^2*(b*c-a*d)*g^4*(a+b*x)) + (5*B^2*d^3*i*n^2*Log[a+b*x])/(18*b^2*(b*c-a*d)^2*g^4) - (B^2*d^3*i*n^2*Log[a+b*x]^2)/(6*b^2*(b*c-a*d)^2*g^4) - (2*B*(b*c-a*d)*i*n*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(9*b^2*g^4*(a+b*x)^3) - (B*d*i*n*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(6*b^2*g^4*(a+b*x)^2) + (B*d^2*i*n*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(3*b^2*(b*c-a*d)*g^4*(a+b*x)) + (B*d^3*i*n*Log[a+b*x]*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(3*b^2*(b*c-a*d)^2*g^4) - ((b*c-a*d)*i*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))^2/(3*b^2*g^4*(a+b*x)^3) - (d*i*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))^2/(2*b^2*g^4$

$$\begin{aligned} &*(a + b*x)^2) - (5*B^2*d^3*i*n^2*Log[c + d*x])/(18*b^2*(b*c - a*d)^2*g^4) + \\ &(B^2*d^3*i*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*b^2*(b*c \\ &- a*d)^2*g^4) - (B*d^3*i*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + \\ &d*x])/(3*b^2*(b*c - a*d)^2*g^4) - (B^2*d^3*i*n^2*Log[c + d*x]^2)/(6*b^2*(b* \\ &c - a*d)^2*g^4) + (B^2*d^3*i*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d \\ &)]/(3*b^2*(b*c - a*d)^2*g^4) + (B^2*d^3*i*n^2*PolyLog[2, -((d*(a + b*x))/(b \\ &*c - a*d))])/(3*b^2*(b*c - a*d)^2*g^4) + (B^2*d^3*i*n^2*PolyLog[2, (b*(c + \\ &d*x))/(b*c - a*d)])/(3*b^2*(b*c - a*d)^2*g^4) \end{aligned}$$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_.))^(m_.)*((c_.) + (d_.)*(x_.))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_.)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n]]^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x
), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}
\int \frac{(166c + 166dx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ag + bgx)^4} dx &= \int \left[ \frac{166(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{bg^4(a + bx)^4} + \frac{166d \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{bg^4(a + bx)^3} \right] dx \\
&= \frac{(166d) \int \frac{\left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(a+bx)^3} dx}{bg^4} + \frac{(166(bc - ad)) \int \frac{\left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(a+bx)^4} dx}{bg^4} \\
&= -\frac{166(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3b^2g^4(a + bx)^3} - \frac{83d \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2g^4(a + bx)^2} \\
&= -\frac{166(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3b^2g^4(a + bx)^3} - \frac{83d \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2g^4(a + bx)^2} \\
&= -\frac{166(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3b^2g^4(a + bx)^3} - \frac{83d \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2g^4(a + bx)^2} \\
&= -\frac{166(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3b^2g^4(a + bx)^3} - \frac{83d \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2g^4(a + bx)^2} \\
&= -\frac{332B(bc - ad)n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{9b^2g^4(a + bx)^3} - \frac{83Bdn \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3b^2g^4(a + bx)^2} \\
&= -\frac{332B(bc - ad)n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{9b^2g^4(a + bx)^3} - \frac{83Bdn \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3b^2g^4(a + bx)^2} \\
&= -\frac{332B(bc - ad)n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{9b^2g^4(a + bx)^3} - \frac{83Bdn \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3b^2g^4(a + bx)^2} \\
&= -\frac{332B^2(bc - ad)n^2}{27b^2g^4(a + bx)^3} + \frac{83B^2dn^2}{18b^2g^4(a + bx)^2} + \frac{415B^2d^2n^2}{9b^2(bc - ad)g^4(a + bx)} + \frac{415B^2d^2n^2}{9b^2(bc - ad)g^4(a + bx)} \\
&= -\frac{332B^2(bc - ad)n^2}{27b^2g^4(a + bx)^3} + \frac{83B^2dn^2}{18b^2g^4(a + bx)^2} + \frac{415B^2d^2n^2}{9b^2(bc - ad)g^4(a + bx)} + \frac{415B^2d^2n^2}{9b^2(bc - ad)g^4(a + bx)} \\
&= -\frac{332B^2(bc - ad)n^2}{27b^2g^4(a + bx)^3} + \frac{83B^2dn^2}{18b^2g^4(a + bx)^2} + \frac{415B^2d^2n^2}{9b^2(bc - ad)g^4(a + bx)} + \frac{415B^2d^2n^2}{9b^2(bc - ad)g^4(a + bx)}
\end{aligned}$$

**Mathematica [C]** time = 1.19571, size = 1079, normalized size = 3.51

$$i \left( 36 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 (bc - ad)^3 + 54d(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 (bc - ad)^2 + 27Bdn(a + bx) \left( 2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 (bc - ad) + 27Bdn(a + bx) \right) \right)$$

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(a\*g + b\*g\*x)^4,x]

[Out] -(i\*(36\*(b\*c - a\*d)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2 + 54\*d\*(b\*c - a\*d)^2\*(a + b\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2 + 27\*B\*d\*n\*(a + b\*x)\*(2\*(b\*c - a\*d)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 4\*d\*(-(b\*c) + a\*d)\*(a + b\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 4\*d^2\*(a + b\*x)^2\*Log[a + b\*x]\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 4\*d^2\*(a + b\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[c + d\*x] - 4\*B\*d\*n\*(a + b\*x)\*(b\*c - a\*d + d\*(a + b\*x)\*Log[a + b\*x] - d\*(a + b\*x)\*Log[c + d\*x]) + B\*n\*((b\*c - a\*d)^2 + 2\*d\*(-(b\*c) + a\*d)\*(a + b\*x) - 2\*d^2\*(a + b\*x)^2\*Log[a + b\*x] + 2\*d^2\*(a + b\*x)^2\*Log[c + d\*x]) + 2\*B\*d^2\*n\*(a + b\*x)^2\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]) - 2\*PolyLog[2, (d\*(a + b\*x))/(-(b\*c) + a\*d)]) - 2\*B\*d^2\*n\*(a + b\*x)^2\*((2\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)] - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])) + 2\*B\*n\*(12\*(b\*c - a\*d)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 18\*d\*(b\*c - a\*d)^2\*(a + b\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 36\*d^2\*(b\*c - a\*d)\*(a + b\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 36\*d^3\*(a + b\*x)^3\*Log[a + b\*x]\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 36\*d^3\*(a + b\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[c + d\*x] + 36\*B\*d^2\*n\*(a + b\*x)^2\*(b\*c - a\*d + d\*(a + b\*x)\*Log[a + b\*x] - d\*(a + b\*x)\*Log[c + d\*x]) - 9\*B\*d\*n\*(a + b\*x)\*((b\*c - a\*d)^2 + 2\*d\*(-(b\*c) + a\*d)\*(a + b\*x) - 2\*d^2\*(a + b\*x)^2\*Log[a + b\*x] + 2\*d^2\*(a + b\*x)^2\*Log[c + d\*x]) + 2\*B\*n\*(2\*(b\*c - a\*d)^3 - 3\*d\*(b\*c - a\*d)^2\*(a + b\*x) + 6\*d^2\*(b\*c - a\*d)\*(a + b\*x)^2 + 6\*d^3\*(a + b\*x)^3\*Log[a + b\*x] - 6\*d^3\*(a + b\*x)^3\*Log[c + d\*x]) - 18\*B\*d^3\*n\*(a + b\*x)^3\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]) - 2\*PolyLog[2, (d\*(a + b\*x))/(-(b\*c) + a\*d)]) + 18\*B\*d^3\*n\*(a + b\*x)^3\*((2\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)] - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])))/(108\*b^2\*(b\*c - a\*d)^2\*g^4\*(a + b\*x)^3)

**Maple [F]** time = 0.54, size = 0, normalized size = 0.

$$\int \frac{dix + ci}{(bgx + ag)^4} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$



Verification of antiderivative is not currently implemented for this CAS.

[In]  $\text{int}((d*i*x+c*i)*(A+B*\ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x)$

[Out]  $\text{int}((d*i*x+c*i)*(A+B*\ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x)$

**Maxima [B]** time = 2.21635, size = 4471, normalized size = 14.56

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In]  $\text{integrate}((d*i*x+c*i)*(A+B*\log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x, \text{algorithm}="maxima")$

[Out] 
$$\begin{aligned} & -1/9*A*B*c*i*n*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4) \\ & + 6*d^3*\log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*\log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4) \\ & - 1/18*A*B*d*i*n*((5*a*b^2*c^2 - 22*a^2*b*c*d + 5*a^3*d^2 - 6*(3*b^3*c*d - a*b^2*d^2)*x^2 + 3*(3*b^3*c^2 - 16*a*b^2*c*d + 5*a^2*b*d^2)*x)/((b^7*c^2 - 2*a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3*(a*b^6*c^2 - 2*a^2*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*c*d + a^4*b^3*d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4) \\ & - 6*(3*b*c*d^2 - a*d^3)*\log(b*x + a)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4) + 6*(3*b*c*d^2 - a*d^3)*\log(d*x + c)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4) \\ & - 1/6*(3*b*x + a)*B^2*d*i*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n)^2/(b^5*g^4*x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) \\ & - 1/54*(6*n*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4) \\ & + 6*d^3*\log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*\log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4) \\ & * \log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + (4*b^3*c^3 - 27*a*b^2*c^2*d + 108*a^2*b*c*d^2 - 85*a^3*d^3 + 66*(b^3*c*d^2 - a*b^2*d^3)*x^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*\log(b*x + a)^2 \\ & - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*\log(d*x + c)^2 - 3*(5*b^3*c^2*d - 54*a*b^2*c*d^2 + 49*a^2*b*d^3)*x + 66*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*\log(b*x + \end{aligned}$$

$$\begin{aligned}
& a) - 6*(11*b^3*d^3*x^3 + 33*a*b^2*d^3*x^2 + 33*a^2*b*d^3*x + 11*a^3*d^3 - 6 \\
& *(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*\log(b*x + a))*\log \\
& (d*x + c))*n^2/(a^3*b^4*c^3*g^4 - 3*a^4*b^3*c^2*d*g^4 + 3*a^5*b^2*c*d^2*g^4 \\
& - a^6*b*d^3*g^4 + (b^7*c^3*g^4 - 3*a*b^6*c^2*d*g^4 + 3*a^2*b^5*c*d^2*g^4 \\
& - a^3*b^4*d^3*g^4)*x^3 + 3*(a*b^6*c^3*g^4 - 3*a^2*b^5*c^2*d*g^4 + 3*a^3*b^4 \\
& *c*d^2*g^4 - a^4*b^3*d^3*g^4)*x^2 + 3*(a^2*b^5*c^3*g^4 - 3*a^3*b^4*c^2*d*g^4 \\
& + 3*a^4*b^3*c*d^2*g^4 - a^5*b^2*d^3*g^4)*x))*B^2*c*i - 1/108*(6*n*((5*a*b \\
& ^2*c^2 - 22*a^2*b*c*d + 5*a^3*d^2 - 6*(3*b^3*c*d - a*b^2*d^2))*x^2 + 3*(3*b^ \\
& 3*c^2 - 16*a*b^2*c*d + 5*a^2*b*d^2))*x)/((b^7*c^2 - 2*a*b^6*c*d + a^2*b^5*d^ \\
& 2)*g^4*x^3 + 3*(a*b^6*c^2 - 2*a^2*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b \\
& ^5*c^2 - 2*a^3*b^4*c*d + a^4*b^3*d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d \\
& + a^5*b^2*d^2)*g^4) - 6*(3*b*c*d^2 - a*d^3)*\log(b*x + a)/((b^5*c^3 - 3*a*b^ \\
& 4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4) + 6*(3*b*c*d^2 - a*d^3)*\log(d \\
& *x + c)/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*g^4))*\log \\
& (e*(b*x/(d*x + c) + a/(d*x + c))^n) + (19*a*b^3*c^3 - 189*a^2*b^2*c^2*d + \\
& 189*a^3*b*c*d^2 - 19*a^4*d^3 - 6*(27*b^4*c^2*d - 32*a*b^3*c*d^2 + 5*a^2*b^2 \\
& *d^3))*x^2 + 18*(3*a^3*b*c*d^2 - a^4*d^3 + (3*b^4*c*d^2 - a*b^3*d^3))*x^3 + 3 \\
& *(3*a*b^3*c*d^2 - a^2*b^2*d^3))*x^2 + 3*(3*a^2*b^2*c*d^2 - a^3*b*d^3)*x)*\log \\
& (b*x + a)^2 + 18*(3*a^3*b*c*d^2 - a^4*d^3 + (3*b^4*c*d^2 - a*b^3*d^3))*x^3 + \\
& 3*(3*a*b^3*c*d^2 - a^2*b^2*d^3))*x^2 + 3*(3*a^2*b^2*c*d^2 - a^3*b*d^3)*x)*\log \\
& (d*x + c)^2 + 3*(9*b^4*c^3 - 125*a*b^3*c^2*d + 135*a^2*b^2*c*d^2 - 19*a^3 \\
& *b*d^3)*x - 6*(27*a^3*b*c*d^2 - 5*a^4*d^3 + (27*b^4*c*d^2 - 5*a*b^3*d^3))*x^ \\
& 3 + 3*(27*a*b^3*c*d^2 - 5*a^2*b^2*d^3))*x^2 + 3*(27*a^2*b^2*c*d^2 - 5*a^3*b* \\
& d^3)*x)*\log(b*x + a) + 6*(27*a^3*b*c*d^2 - 5*a^4*d^3 + (27*b^4*c*d^2 - 5*a* \\
& b^3*d^3))*x^3 + 3*(27*a*b^3*c*d^2 - 5*a^2*b^2*d^3))*x^2 + 3*(27*a^2*b^2*c*d^2 \\
& - 5*a^3*b*d^3)*x - 6*(3*a^3*b*c*d^2 - a^4*d^3 + (3*b^4*c*d^2 - a*b^3*d^3))* \\
& x^3 + 3*(3*a*b^3*c*d^2 - a^2*b^2*d^3))*x^2 + 3*(3*a^2*b^2*c*d^2 - a^3*b*d^3) \\
& *x)*\log(b*x + a))*\log(d*x + c))*n^2/(a^3*b^5*c^3*g^4 - 3*a^4*b^4*c^2*d*g^4 \\
& + 3*a^5*b^3*c*d^2*g^4 - a^6*b^2*d^3*g^4 + (b^8*c^3*g^4 - 3*a*b^7*c^2*d*g^4 \\
& + 3*a^2*b^6*c*d^2*g^4 - a^3*b^5*d^3*g^4)*x^3 + 3*(a*b^7*c^3*g^4 - 3*a^2*b^6 \\
& *c^2*d*g^4 + 3*a^3*b^5*c*d^2*g^4 - a^4*b^4*d^3*g^4)*x^2 + 3*(a^2*b^6*c^3*g^4 \\
& - 3*a^3*b^5*c^2*d*g^4 + 3*a^4*b^4*c*d^2*g^4 - a^5*b^3*d^3*g^4)*x))*B^2*d* \\
& i - 1/3*(3*b*x + a)*A*B*d*i*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^5*g^4 \\
& *x^3 + 3*a*b^4*g^4*x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) - 1/3*B^2*c*i*\log(e \\
& *(b*x/(d*x + c) + a/(d*x + c))^n)^2/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2* \\
& b^2*g^4*x + a^3*b*g^4) - 1/6*(3*b*x + a)*A^2*d*i/(b^5*g^4*x^3 + 3*a*b^4*g^4 \\
& *x^2 + 3*a^2*b^3*g^4*x + a^3*b^2*g^4) - 2/3*A*B*c*i*\log(e*(b*x/(d*x + c) + \\
& a/(d*x + c))^n)/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^ \\
& 4) - 1/3*A^2*c*i/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g \\
& ^4)
\end{aligned}$$

**Fricas [B]** time = 0.611944, size = 2388, normalized size = 7.78

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^4,x, algorithm="fricas")

[Out] 
$$-1/108*((8*B^2*b^3*c^3 - 27*B^2*a*b^2*c^2*d + 19*B^2*a^3*d^3)*i*n^2 + 6*(4*A*B*b^3*c^3 - 9*A*B*a*b^2*c^2*d + 5*A*B*a^3*d^3)*i*n - 6*(5*(B^2*b^3*c*d^2 - B^2*a*b^2*d^3)*i*n^2 + 6*(A*B*b^3*c*d^2 - A*B*a*b^2*d^3)*i*n)*x^2 + 18*(3*(B^2*b^3*c^2*d - 2*B^2*a*b^2*c*d^2 + B^2*a^2*b*d^3)*i*x + (2*B^2*b^3*c^3 - 3*B^2*a*b^2*c^2*d + B^2*a^3*d^3)*i)*\log(e)^2 - 18*(B^2*b^3*d^3*i*n^2*x^3 + 3*B^2*a*b^2*d^3*i*n^2*x^2 - 3*(B^2*b^3*c^2*d - 2*B^2*a*b^2*c*d^2)*i*n^2*x - (2*B^2*b^3*c^3 - 3*B^2*a*b^2*c^2*d)*i*n^2)*\log((b*x + a)/(d*x + c))^2 + 18*(2*A^2*b^3*c^3 - 3*A^2*a*b^2*c^2*d + A^2*a^3*d^3)*i - 3*((B^2*b^3*c^2*d + 18*B^2*a*b^2*c*d^2 - 19*B^2*a^2*b*d^3)*i*n^2 - 6*(A*B*b^3*c^2*d - 6*A*B*a*b^2*c*d^2 + 5*A*B*a^2*b*d^3)*i*n - 18*(A^2*b^3*c^2*d - 2*A^2*a*b^2*c*d^2 + A^2*a^2*b*d^3)*i)*x - 6*(6*(B^2*b^3*c*d^2 - B^2*a*b^2*d^3)*i*n*x^2 - (4*B^2*b^3*c^3 - 9*B^2*a*b^2*c^2*d + 5*B^2*a^3*d^3)*i*n - 6*(2*A*B*b^3*c^3 - 3*A*B*a*b^2*c^2*d + A*B*a^3*d^3)*i - 3*((B^2*b^3*c^2*d - 6*B^2*a*b^2*c*d^2 + 5*B^2*a^2*b*d^3)*i*n + 6*(A*B*b^3*c^2*d - 2*A*B*a*b^2*c*d^2 + A*B*a^2*b*d^3)*i)*x + 6*(B^2*b^3*d^3*i*n*x^3 + 3*B^2*a*b^2*d^3*i*n*x^2 - 3*(B^2*b^3*c^2*d - 2*B^2*a*b^2*c*d^2)*i*n*x - (2*B^2*b^3*c^3 - 3*B^2*a*b^2*c^2*d)*i*n)*\log((b*x + a)/(d*x + c))*\log(e) + 6*((4*B^2*b^3*c^3 - 9*B^2*a*b^2*c^2*d)*i*n^2 - (5*B^2*b^3*d^3*i*n^2 + 6*A*B*b^3*d^3*i*n)*x^3 + 6*(2*A*B*b^3*c^3 - 3*A*B*a*b^2*c^2*d)*i*n - 3*(6*A*B*a*b^2*d^3*i*n + (2*B^2*b^3*c*d^2 + 3*B^2*a*b^2*d^3)*i*n^2)*x^2 + 3*((B^2*b^3*c^2*d - 6*B^2*a*b^2*c*d^2)*i*n^2 + 6*(A*B*b^3*c^2*d - 2*A*B*a*b^2*c*d^2)*i*n)*x)*\log((b*x + a)/(d*x + c)))/((b^7*c^2 - 2*a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3*(a*b^6*c^2 - 2*a^2*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*c*d + a^4*b^3*d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4)$$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)\*\*4,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci) \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2}{(bgx + ag)^4} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^4,x, algorithm="giac")

[Out] integrate((d\*i\*x + c\*i)\*(B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)^2/(b\*g\*x + a\*g)^4, x)

$$3.167 \quad \int \frac{(ci+dx) \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ag+bgx)^5} dx$$

**Optimal.** Leaf size=475

$$\frac{b^2 i(c+dx)^4 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)^2}{4g^5(a+bx)^4(bc-ad)^3} - \frac{b^2 Bin(c+dx)^4 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{8g^5(a+bx)^4(bc-ad)^3} - \frac{d^2 i(c+dx)^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{2g^5(a+bx)^2(bc-ad)^3}$$

[Out]  $-(B^2 d^2 i n^2 (c+dx)^2)/(4(b^2 c - a^2 d)^3 g^5 (a+bx)^2) + (4 b^2 B^2 d i n^2 (c+dx)^3)/(27(b^2 c - a^2 d)^3 g^5 (a+bx)^3) - (b^2 B^2 i n^2 (c+dx)^4)/(32(b^2 c - a^2 d)^3 g^5 (a+bx)^4) - (B^2 d^2 i n (c+dx)^2 (A + B \log[e*((a+bx)/(c+dx))^n]))/(2(b^2 c - a^2 d)^3 g^5 (a+bx)^2) + (4 b^2 B^2 d i n (c+dx)^3 (A + B \log[e*((a+bx)/(c+dx))^n]))/(9(b^2 c - a^2 d)^3 g^5 (a+bx)^3) - (b^2 B^2 i n (c+dx)^4 (A + B \log[e*((a+bx)/(c+dx))^n]))/(8(b^2 c - a^2 d)^3 g^5 (a+bx)^4) - (d^2 i (c+dx)^2 (A + B \log[e*((a+bx)/(c+dx))^n]))/(2(b^2 c - a^2 d)^3 g^5 (a+bx)^2) + (2 b^2 d i (c+dx)^3 (A + B \log[e*((a+bx)/(c+dx))^n]))/(3(b^2 c - a^2 d)^3 g^5 (a+bx)^3) - (b^2 i (c+dx)^4 (A + B \log[e*((a+bx)/(c+dx))^n]))/(4(b^2 c - a^2 d)^3 g^5 (a+bx)^4)$

**Rubi [C]** time = 2.87453, antiderivative size = 892, normalized size of antiderivative = 1.88, number of steps used = 70, number of rules used = 11, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.256$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2 i n^2 \log^2(a+bx) d^4}{12 b^2 (bc-ad)^3 g^5} + \frac{B^2 i n^2 \log^2(c+dx) d^4}{12 b^2 (bc-ad)^3 g^5} - \frac{13 B^2 i n^2 \log(a+bx) d^4}{72 b^2 (bc-ad)^3 g^5} - \frac{Bin \log(a+bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) d^4}{6 b^2 (bc-ad)^3 g^5} +$$

Antiderivative was successfully verified.

[In] Int[((c\*i + d\*i\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(a\*g + b\*g\*x)^5, x]

[Out]  $-(B^2(b^2 c - a^2 d) i n^2)/(32 b^2 g^5 (a+bx)^4) + (5 B^2 d i n^2)/(216 b^2 g^5 (a+bx)^3) + (B^2 d^2 i n^2)/(144 b^2 (b^2 c - a^2 d) g^5 (a+bx)^2) - (13 B^2 d^3 i n^2)/(72 b^2 (b^2 c - a^2 d)^2 g^5 (a+bx)) - (13 B^2 d^4 i n^2 \log[a+bx])/(72 b^2 (b^2 c - a^2 d)^3 g^5) + (B^2 d^4 i n^2 \log[a+bx]^2)/(12 b^2 (b^2 c - a^2 d)^3 g^5) - (B(b^2 c - a^2 d) i n (A + B \log[e*((a+bx)/(c+dx))^n]))/(8 b^2 g^5 (a+bx)^4) - (B^2 d i n (A + B \log[e*((a+bx)/(c+dx))^n]))/(8 b^2 g^5 (a+bx)^4)$

$$\frac{(c + dx)^n)}{(18b^2g^5(a + bx)^3 + (Bd^2in(A + B\log[e((a + bx)/(c + dx))^n]))/(12b^2(bc - a)d)g^5(a + bx)^2 - (Bd^3in(A + B\log[e((a + bx)/(c + dx))^n]))/(6b^2(bc - a)d)^2g^5(a + bx) - (Bd^4in\log[a + bx](A + B\log[e((a + bx)/(c + dx))^n]))/(6b^2(bc - a)d)^3g^5) - ((bc - a)d)in(A + B\log[e((a + bx)/(c + dx))^n])^2/(4b^2g^5(a + bx)^4 - (d)in(A + B\log[e((a + bx)/(c + dx))^n])^2)/(3b^2g^5(a + bx)^3 + (13B^2d^4in^2\log[c + dx])/(72b^2(bc - a)d)^3g^5) - (B^2d^4in^2\log[-((d(a + bx))/(bc - a)d)]*\log[c + dx])/(6b^2(bc - a)d)^3g^5 + (Bd^4in(A + B\log[e((a + bx)/(c + dx))^n])*\log[c + dx])/(6b^2(bc - a)d)^3g^5 + (B^2d^4in^2\log[c + dx]^2)/(12b^2(bc - a)d)^3g^5 - (B^2d^4in^2\log[a + bx]*\log[(b(c + dx))/(bc - a)d])/(6b^2(bc - a)d)^3g^5 - (B^2d^4in^2\text{PolyLog}[2, -((d(a + bx))/(bc - a)d)])/(6b^2(bc - a)d)^3g^5 - (B^2d^4in^2\text{PolyLog}[2, (b(c + dx))/(bc - a)d])/(6b^2(bc - a)d)^3g^5)$$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_) /; FreeQ[b, x]]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol]
:> Simp[(Log[d + e*x]*(a + b*Log[c*RFX^p])^n)/e, x] - Dist[(b*n*p)/e,
Int[(Log[d + e*x]*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFX_), x_Symbol]
:> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFX, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFX, x] && IntegerQ[p]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)
*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x],
x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Log[
c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)),
x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n]))/g, x]
- Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /;
FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol]
:> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /;
FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2,
-(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rubi steps

$$\begin{aligned}
\int \frac{(167c + 167dx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ag + bgx)^5} dx &= \int \left[ \frac{167(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{bg^5(a + bx)^5} + \frac{167d \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right) \right) \right)^2}{bg^5(a + bx)^4} \right] dx \\
&= \frac{(167d) \int \frac{\left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(a+bx)^4} dx}{bg^5} + \frac{(167(bc - ad)) \int \frac{\left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(a+bx)^5} dx}{bg^5} \\
&= -\frac{167(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{4b^2g^5(a + bx)^4} - \frac{167d \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right) \right) \right)^2}{3b^2g^5(a + bx)^3} \\
&= -\frac{167(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{4b^2g^5(a + bx)^4} - \frac{167d \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right) \right) \right)^2}{3b^2g^5(a + bx)^3} \\
&= -\frac{167(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{4b^2g^5(a + bx)^4} - \frac{167d \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right) \right) \right)^2}{3b^2g^5(a + bx)^3} \\
&= -\frac{167(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{4b^2g^5(a + bx)^4} - \frac{167d \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right) \right) \right)^2}{3b^2g^5(a + bx)^3} \\
&= -\frac{167B(bc - ad)n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{8b^2g^5(a + bx)^4} - \frac{167Bdn \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right) \right) \right)}{18b^2g^5(a + bx)^3} \\
&= -\frac{167B(bc - ad)n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{8b^2g^5(a + bx)^4} - \frac{167Bdn \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right) \right) \right)}{18b^2g^5(a + bx)^3} \\
&= -\frac{167B(bc - ad)n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{8b^2g^5(a + bx)^4} - \frac{167Bdn \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right) \right) \right)}{18b^2g^5(a + bx)^3} \\
&= -\frac{167B^2(bc - ad)n^2}{32b^2g^5(a + bx)^4} + \frac{835B^2dn^2}{216b^2g^5(a + bx)^3} + \frac{167B^2d^2n^2}{144b^2(bc - ad)g^5(a + bx)^2} \\
&= -\frac{167B^2(bc - ad)n^2}{32b^2g^5(a + bx)^4} + \frac{835B^2dn^2}{216b^2g^5(a + bx)^3} + \frac{167B^2d^2n^2}{144b^2(bc - ad)g^5(a + bx)^2} \\
&= -\frac{167B^2(bc - ad)n^2}{32b^2g^5(a + bx)^4} + \frac{835B^2dn^2}{216b^2g^5(a + bx)^3} + \frac{167B^2d^2n^2}{144b^2(bc - ad)g^5(a + bx)^2}
\end{aligned}$$



**Mathematica [C]** time = 1.46439, size = 1392, normalized size = 2.93

$$i \left( 216 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 (bc-ad)^4 - 288d(ad-bc)^3(a+bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 + 16Bdn(a+bx) \left( 12 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 \right. \right.$$

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(a\*g + b\*g\*x)^5,x]

[Out] -(i\*(216\*(b\*c - a\*d)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2 - 288\*d\*(-(b\*c) + a\*d)^3\*(a + b\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2 + 16\*B\*d\*n\*(a + b\*x)\*(12\*(b\*c - a\*d)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 18\*d\*(b\*c - a\*d)^2\*(a + b\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 36\*d^2\*(b\*c - a\*d)\*(a + b\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 36\*d^3\*(a + b\*x)^3\*Log[a + b\*x]\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 36\*d^3\*(a + b\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[c + d\*x] + 36\*B\*d^2\*n\*(a + b\*x)^2\*(b\*c - a\*d + d\*(a + b\*x)\*Log[a + b\*x] - d\*(a + b\*x)\*Log[c + d\*x]) - 9\*B\*d\*n\*(a + b\*x)\*((b\*c - a\*d)^2 + 2\*d\*(-(b\*c) + a\*d)\*(a + b\*x) - 2\*d^2\*(a + b\*x)^2\*Log[a + b\*x] + 2\*d^2\*(a + b\*x)^2\*Log[c + d\*x]) + 2\*B\*n\*(2\*(b\*c - a\*d)^3 - 3\*d\*(b\*c - a\*d)^2\*(a + b\*x) + 6\*d^2\*(b\*c - a\*d)\*(a + b\*x)^2 + 6\*d^3\*(a + b\*x)^3\*Log[a + b\*x] - 6\*d^3\*(a + b\*x)^3\*Log[c + d\*x]) - 18\*B\*d^3\*n\*(a + b\*x)^3\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d])) - 2\*PolyLog[2, (d\*(a + b\*x))/(-(b\*c) + a\*d)]) + 18\*B\*d^3\*n\*(a + b\*x)^3\*((2\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)] - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)]) + 3\*B\*n\*(36\*(b\*c - a\*d)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 48\*d\*(-(b\*c) + a\*d)^3\*(a + b\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 72\*d^2\*(b\*c - a\*d)^2\*(a + b\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 144\*d^3\*(-(b\*c) + a\*d)\*(a + b\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 144\*d^4\*(a + b\*x)^4\*Log[a + b\*x]\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 144\*d^4\*(a + b\*x)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[c + d\*x] - 144\*B\*d^3\*n\*(a + b\*x)^3\*(b\*c - a\*d + d\*(a + b\*x)\*Log[a + b\*x] - d\*(a + b\*x)\*Log[c + d\*x]) + 36\*B\*d^2\*n\*(a + b\*x)^2\*((b\*c - a\*d)^2 + 2\*d\*(-(b\*c) + a\*d)\*(a + b\*x) - 2\*d^2\*(a + b\*x)^2\*Log[a + b\*x] + 2\*d^2\*(a + b\*x)^2\*Log[c + d\*x]) - 8\*B\*d\*n\*(a + b\*x)\*(2\*(b\*c - a\*d)^3 - 3\*d\*(b\*c - a\*d)^2\*(a + b\*x) + 6\*d^2\*(b\*c - a\*d)\*(a + b\*x)^2 + 6\*d^3\*(a + b\*x)^3\*Log[a + b\*x] - 6\*d^3\*(a + b\*x)^3\*Log[c + d\*x]) + 3\*B\*n\*(3\*(b\*c - a\*d)^4 + 4\*d\*(-(b\*c) + a\*d)^3\*(a + b\*x) + 6\*d^2\*(b\*c - a\*d)^2\*(a + b\*x)^2 + 12\*d^3\*(-(b\*c) + a\*d)\*(a + b\*x)^3 - 12\*d^4\*(a + b\*x)^4\*Log[a + b\*x] + 12\*d^4\*(a + b\*x)^4\*Log[c + d\*x]) + 72\*B\*d^4\*n\*(a + b\*x)^4\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d])) - 2\*PolyLog[2, (d\*(a + b\*x))/(-(b\*c) + a\*d)]) - 72\*B\*d^4\*n\*(a + b\*x)^4\*((2\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)] - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])))/(864\*b^2\*(b\*c - a\*d)^2)

$d)^3 g^5 (a + b x)^4$

**Maple [F]** time = 0.532, size = 0, normalized size = 0.

$$\int \frac{dix + ci}{(bgx + ag)^5} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^5,x)

[Out] int((d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^5,x)

**Maxima [B]** time = 3.05988, size = 6531, normalized size = 13.75

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^5,x, a  
lgorithm="maxima")

[Out]  $\frac{1}{24} A B c i n \left( (12 b^3 d^3 x^3 - 3 b^3 c^3 + 13 a b^2 c^2 d - 23 a^2 b c d^2 + 25 a^3 d^3 - 6 (b^3 c d^2 - 7 a b^2 d^3) x^2 + 4 (b^3 c^2 d - 5 a b^2 c d^2 + 13 a^2 b d^3) x \right) / \left( (b^8 c^3 - 3 a b^7 c^2 d + 3 a^2 b^6 c d^2 - a^3 b^5 d^3) g^5 x^4 + 4 (a b^7 c^3 - 3 a^2 b^6 c^2 d + 3 a^3 b^5 c d^2 - a^4 b^4 d^3) g^5 x^3 + 6 (a^2 b^6 c^3 - 3 a^3 b^5 c^2 d + 3 a^4 b^4 c d^2 - a^5 b^3 d^3) g^5 x^2 + 4 (a^3 b^5 c^3 - 3 a^4 b^4 c^2 d + 3 a^5 b^3 c d^2 - a^6 b^2 d^3) g^5 x + (a^4 b^4 c^3 - 3 a^5 b^3 c^2 d + 3 a^6 b^2 c d^2 - a^7 b d^3) g^5 \right) + 12 d^4 \log(b x + a) / \left( (b^5 c^4 - 4 a b^4 c^3 d + 6 a^2 b^3 c^2 d^2 - 4 a^3 b^2 c d^3 + a^4 b d^4) g^5 \right) - 12 d^4 \log(d x + c) / \left( (b^5 c^4 - 4 a b^4 c^3 d + 6 a^2 b^3 c^2 d^2 - 4 a^3 b^2 c d^3 + a^4 b d^4) g^5 \right) - \frac{1}{72} A B d i n \left( (7 a b^3 c^3 - 33 a^2 b^2 c^2 d + 75 a^3 b c d^2 - 13 a^4 d^3 + 12 (4 b^4 c d^2 - a b^3 d^3) x^3 - 6 (4 b^4 c^2 d - 29 a b^3 c d^2 + 7 a^2 b^2 d^3) x^2 + 4 (4 b^4 c^3 - 21 a b^3 c^2 d + 57 a^2 b^2 c d^2 - 13 a^3 b d^3) x \right) / \left( (b^9 c^3 - 3 a b^8 c^2 d + 3 a^2 b^7 c d^2 - a^3 b^6 d^3) g^5 x^4 + 4 (a b^8 c^3 - 3 a^2 b^7 c^2 d + 3 a^3 b^6 c d^2 - a^4 b^5 d^3) g^5 x^3 + 6 (a^2 b^7 c^3 - 3 a^3 b^6 c^2 d + 3 a^4 b^5 c d^2 - a^5 b^4 d^3) g^5 x^2 + 4 (a^3 b^6 c^3 - 3 a^4 b^5 c^2 d + 3 a^5 b^4 c d^2 - a^6 b^3 d^3) g^5 x \right)$

$$\begin{aligned}
& + (a^4 b^5 c^3 - 3a^5 b^4 c^2 d + 3a^6 b^3 c d^2 - a^7 b^2 d^3) g^5 + 12 \\
& * (4b^3 c d^3 - a d^4) \log(bx + a) / ((b^6 c^4 - 4a b^5 c^3 d + 6a^2 b^4 c^2 d^2 - 4a^3 b^3 c d^3 + a^4 \\
& * b^2 d^4) g^5) - 12 * (4b^3 c d^3 - a d^4) \log(dx + c) / ((b^6 c^4 - 4a b^5 c^3 d + 6a^2 b^4 c^2 d^2 - 4a^3 b^3 c d^3 + a^4 \\
& * b^2 d^4) g^5) - 1/12 * (4bx + a) B^2 d i \log(e * (bx / (dx + c) + a / (dx + c)))^n)^2 / (b^6 g^5 x^4 + 4a b^5 g^5 x^3 + 6a^2 b^4 g^5 x^2 + 4a^3 b^3 g^5 \\
& * x + a^4 b^2 g^5) + 1/288 * (12n * ((12b^3 d^3 x^3 - 3b^3 c^3 + 13a b^2 c^2 \\
& * d - 23a^2 b c d^2 + 25a^3 d^3 - 6(b^3 c d^2 - 7a b^2 d^3) x^2 + 4(b^3 \\
& * c^2 d - 5a b^2 c d^2 + 13a^2 b d^3) x) / ((b^8 c^3 - 3a b^7 c^2 d + 3a^2 \\
& * b^6 c d^2 - a^3 b^5 d^3) g^5 x^4 + 4(a b^7 c^3 - 3a^2 b^6 c^2 d + 3a^3 b^5 c d^2 - a^4 b^4 d^3) g^5 x^3 + 6(a^2 b^6 c^3 - 3a^3 b^5 c^2 d + 3a^4 \\
& * b^4 c d^2 - a^5 b^3 d^3) g^5 x^2 + 4(a^3 b^5 c^3 - 3a^4 b^4 c^2 d + 3a^5 b^3 c d^2 - a^6 b^2 d^3) g^5 x + (a^4 b^4 c^3 - 3a^5 b^3 c^2 d + 3a^6 b^2 c d^2 - a^7 b d^3) g^5) + 12 d^4 \log(bx + a) / ((b^5 c^4 - 4a b^4 c^3 d + 6a^2 b^3 c^2 d^2 - 4a^3 b^2 c d^3 + a^4 b \\
& * d^4) g^5) * \log(e * (bx / (dx + c) + a / (dx + c)))^n - (9b^4 c^4 - 64a b^3 c^3 d + 216a^2 b^2 c^2 d^2 - 576a^3 b c d^3 + 415a^4 d^4 - 300(b^4 c d^3 \\
& - a b^3 d^4) x^3 + 6(13b^4 c^2 d^2 - 176a b^3 c d^3 + 163a^2 b^2 d^4) x^2 + 72(b^4 d^4 x^4 + 4a b^3 d^4 x^3 + 6a^2 b^2 d^4 x^2 + 4a^3 b d^4 x \\
& + a^4 d^4) \log(bx + a)^2 + 72(b^4 d^4 x^4 + 4a b^3 d^4 x^3 + 6a^2 b^2 d^4 x^2 + 4a^3 b d^4 x + a^4 d^4) \log(dx + c)^2 - 4(7b^4 c^3 d - 60a b^3 c^2 d^2 + 324a^2 b^2 c d^3 - 271a^3 b d^4) x - 300(b^4 d^4 x^4 + 4a a \\
& b^3 d^4 x^3 + 6a^2 b^2 d^4 x^2 + 4a^3 b d^4 x + a^4 d^4) \log(bx + a) + 1 \\
& 2 * (25b^4 d^4 x^4 + 100a b^3 d^4 x^3 + 150a^2 b^2 d^4 x^2 + 100a^3 b d^4 \\
& * x + 25a^4 d^4 - 12(b^4 d^4 x^4 + 4a b^3 d^4 x^3 + 6a^2 b^2 d^4 x^2 + 4 \\
& * a^3 b d^4 x + a^4 d^4) \log(bx + a)) \log(dx + c)) n^2 / (a^4 b^5 c^4 g^5 - \\
& 4a^5 b^4 c^3 d g^5 + 6a^6 b^3 c^2 d^2 g^5 - 4a^7 b^2 c d^3 g^5 + a^8 b d^4 g^5 + (b^9 c^4 g^5 - 4a b^8 c^3 d g^5 + 6a^2 b^7 c^2 d^2 g^5 - 4a^3 b^6 c d^3 g^5 + a^4 b^5 d^4 g^5) x^4 + 4(a b^8 c^4 g^5 - 4a^2 b^7 c^3 d g^5 \\
& + 6a^3 b^6 c^2 d^2 g^5 - 4a^4 b^5 c d^3 g^5 + a^5 b^4 d^4 g^5) x^3 + 6 \\
& (a^2 b^7 c^4 g^5 - 4a^3 b^6 c^3 d g^5 + 6a^4 b^5 c^2 d^2 g^5 - 4a^5 b^4 c d^3 g^5 + a^6 b^3 d^4 g^5) x^2 + 4(a^3 b^6 c^4 g^5 - 4a^4 b^5 c^3 d g^5 \\
& + 6a^5 b^4 c^2 d^2 g^5 - 4a^6 b^3 c d^3 g^5 + a^7 b^2 d^4 g^5) x) B^2 c \\
& * i - 1/864 * (12n * ((7a b^3 c^3 - 33a^2 b^2 c^2 d + 75a^3 b c d^2 - 13a^4 \\
& * d^3 + 12(4b^4 c d^2 - a b^3 d^3) x^3 - 6(4b^4 c^2 d - 29a b^3 c d^2 + \\
& 7a^2 b^2 d^3) x^2 + 4(4b^4 c^3 - 21a b^3 c^2 d + 57a^2 b^2 c d^2 - 13 \\
& * a^3 b d^3) x) / ((b^9 c^3 - 3a b^8 c^2 d + 3a^2 b^7 c d^2 - a^3 b^6 d^3) g^5 x^4 + 4(a b^8 c^3 - 3a^2 b^7 c^2 d + 3a^3 b^6 c d^2 - a^4 b^5 d^3) g^5 x^3 + 6(a^2 b^7 c^3 - 3a^3 b^6 c^2 d + 3a^4 b^5 c d^2 - a^5 b^4 d^3) g^5 x^2 + 4(a^3 b^6 c^3 - 3a^4 b^5 c^2 d + 3a^5 b^4 c d^2 - a^6 b^3 d^3) g^5 x + (a^4 b^5 c^3 - 3a^5 b^4 c^2 d + 3a^6 b^3 c d^2 - a^7 b^2 d^3) g^5) + 12 * (4b^3 c d^3 - a d^4) \log(bx + a) / ((b^6 c^4 - 4a b^5 c^3 d + 6a^2 b^4 c^2 d^2 - 4a^3 b^3 c d^3 + a^4 b^2 d^4) g^5) - 12 * (4b^3 c d^3 - a d^4) \log(dx + c) / ((b^6 c^4 - 4a b^5 c^3 d + 6a^2 b^4 c^2 d^2 - 4a^3 b^3 c d^3 + a^4 b^2 d^4) g^5)
\end{aligned}$$

$$\begin{aligned}
& + a^4 b^2 d^4) g^5) * \log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + (37*a*b^4*c^4 \\
& - 304*a^2*b^3*c^3*d + 1512*a^3*b^2*c^2*d^2 - 1360*a^4*b*c*d^3 + 115*a^5*d^4 \\
& + 12*(88*b^5*c^2*d^2 - 101*a*b^4*c*d^3 + 13*a^2*b^3*d^4)*x^3 - 6*(40*b^5 \\
& *c^3*d - 609*a*b^4*c^2*d^2 + 648*a^2*b^3*c*d^3 - 79*a^3*b^2*d^4)*x^2 - 72*( \\
& 4*a^4*b*c*d^3 - a^5*d^4 + (4*b^5*c*d^3 - a*b^4*d^4)*x^4 + 4*(4*a*b^4*c*d^3 \\
& - a^2*b^3*d^4)*x^3 + 6*(4*a^2*b^3*c*d^3 - a^3*b^2*d^4)*x^2 + 4*(4*a^3*b^2*c \\
& *d^3 - a^4*b*d^4)*x) * \log(b*x + a)^2 - 72*(4*a^4*b*c*d^3 - a^5*d^4 + (4*b^5* \\
& c*d^3 - a*b^4*d^4)*x^4 + 4*(4*a*b^4*c*d^3 - a^2*b^3*d^4)*x^3 + 6*(4*a^2*b^3 \\
& *c*d^3 - a^3*b^2*d^4)*x^2 + 4*(4*a^3*b^2*c*d^3 - a^4*b*d^4)*x) * \log(d*x + c) \\
& ^2 + 4*(16*b^5*c^4 - 163*a*b^4*c^3*d + 1068*a^2*b^3*c^2*d^2 - 1036*a^3*b^2* \\
& c*d^3 + 115*a^4*b*d^4)*x + 12*(88*a^4*b*c*d^3 - 13*a^5*d^4 + (88*b^5*c*d^3 \\
& - 13*a*b^4*d^4)*x^4 + 4*(88*a*b^4*c*d^3 - 13*a^2*b^3*d^4)*x^3 + 6*(88*a^2*b^3 \\
& *c*d^3 - 13*a^3*b^2*d^4)*x^2 + 4*(88*a^3*b^2*c*d^3 - 13*a^4*b*d^4)*x) * \log \\
& (b*x + a) - 12*(88*a^4*b*c*d^3 - 13*a^5*d^4 + (88*b^5*c*d^3 - 13*a*b^4*d^4) \\
& *x^4 + 4*(88*a*b^4*c*d^3 - 13*a^2*b^3*d^4)*x^3 + 6*(88*a^2*b^3*c*d^3 - 13*a^3 \\
& *b^2*d^4)*x^2 + 4*(88*a^3*b^2*c*d^3 - 13*a^4*b*d^4)*x - 12*(4*a^4*b*c*d^3 \\
& - a^5*d^4 + (4*b^5*c*d^3 - a*b^4*d^4)*x^4 + 4*(4*a*b^4*c*d^3 - a^2*b^3*d^4) \\
& ) * x^3 + 6*(4*a^2*b^3*c*d^3 - a^3*b^2*d^4)*x^2 + 4*(4*a^3*b^2*c*d^3 - a^4*b* \\
& d^4)*x) * \log(b*x + a) * \log(d*x + c)) * n^2 / (a^4*b^6*c^4*g^5 - 4*a^5*b^5*c^3*d* \\
& g^5 + 6*a^6*b^4*c^2*d^2*g^5 - 4*a^7*b^3*c*d^3*g^5 + a^8*b^2*d^4*g^5 + (b^10 \\
& *c^4*g^5 - 4*a*b^9*c^3*d*g^5 + 6*a^2*b^8*c^2*d^2*g^5 - 4*a^3*b^7*c*d^3*g^5 \\
& + a^4*b^6*d^4*g^5)*x^4 + 4*(a*b^9*c^4*g^5 - 4*a^2*b^8*c^3*d*g^5 + 6*a^3*b^7 \\
& *c^2*d^2*g^5 - 4*a^4*b^6*c*d^3*g^5 + a^5*b^5*d^4*g^5)*x^3 + 6*(a^2*b^8*c^4* \\
& g^5 - 4*a^3*b^7*c^3*d*g^5 + 6*a^4*b^6*c^2*d^2*g^5 - 4*a^5*b^5*c*d^3*g^5 + a^6 \\
& *b^4*d^4*g^5)*x^2 + 4*(a^3*b^7*c^4*g^5 - 4*a^4*b^6*c^3*d*g^5 + 6*a^5*b^5*c^2 \\
& *d^2*g^5 - 4*a^6*b^4*c*d^3*g^5 + a^7*b^3*d^4*g^5)*x) * B^2*d*i - 1/6*(4*b \\
& *x + a) * A*B*d*i * \log(e*(b*x/(d*x + c) + a/(d*x + c))^n) / (b^6*g^5*x^4 + 4*a*b \\
& ^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4*b^2*g^5) - 1/4*B^2*c \\
& *i * \log(e*(b*x/(d*x + c) + a/(d*x + c))^n)^2 / (b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 \\
& + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) - 1/12*(4*b*x + a) * A^2*d \\
& *i / (b^6*g^5*x^4 + 4*a*b^5*g^5*x^3 + 6*a^2*b^4*g^5*x^2 + 4*a^3*b^3*g^5*x + a^4 \\
& *b^2*g^5) - 1/2*A*B*c*i * \log(e*(b*x/(d*x + c) + a/(d*x + c))^n) / (b^5*g^5*x \\
& ^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) - 1 \\
& /4*A^2*c*i / (b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5 \\
& *x + a^4*b*g^5)
\end{aligned}$$

**Fricas [B]** time = 0.697496, size = 3800, normalized size = 8.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^5,x, a

lgorithm="fricas")

```
[Out] -1/864*((27*B^2*b^4*c^4 - 128*B^2*a*b^3*c^3*d + 216*B^2*a^2*b^2*c^2*d^2 - 1
15*B^2*a^4*d^4)*i^n^2 + 12*(13*(B^2*b^4*c*d^3 - B^2*a*b^3*d^4)*i^n^2 + 12*(
A*B*b^4*c*d^3 - A*B*a*b^3*d^4)*i^n)*x^3 + 12*(9*A*B*b^4*c^4 - 32*A*B*a*b^3*
c^3*d + 36*A*B*a^2*b^2*c^2*d^2 - 13*A*B*a^4*d^4)*i^n - 6*((B^2*b^4*c^2*d^2
- 80*B^2*a*b^3*c*d^3 + 79*B^2*a^2*b^2*d^4)*i^n^2 + 12*(A*B*b^4*c^2*d^2 - 8*
A*B*a*b^3*c*d^3 + 7*A*B*a^2*b^2*d^4)*i^n)*x^2 + 72*(4*(B^2*b^4*c^3*d - 3*B^
2*a*b^3*c^2*d^2 + 3*B^2*a^2*b^2*c*d^3 - B^2*a^3*b*d^4)*i*x + (3*B^2*b^4*c^4
- 8*B^2*a*b^3*c^3*d + 6*B^2*a^2*b^2*c^2*d^2 - B^2*a^4*d^4)*i)*log(e)^2 + 7
2*(B^2*b^4*d^4*i^n^2*x^4 + 4*B^2*a*b^3*d^4*i^n^2*x^3 + 6*B^2*a^2*b^2*d^4*i*
n^2*x^2 + 4*(B^2*b^4*c^3*d - 3*B^2*a*b^3*c^2*d^2 + 3*B^2*a^2*b^2*c*d^3)*i*n
^2*x + (3*B^2*b^4*c^4 - 8*B^2*a*b^3*c^3*d + 6*B^2*a^2*b^2*c^2*d^2)*i^n^2)*l
og((b*x + a)/(d*x + c))^2 + 72*(3*A^2*b^4*c^4 - 8*A^2*a*b^3*c^3*d + 6*A^2*a
^2*b^2*c^2*d^2 - A^2*a^4*d^4)*i - 4*((5*B^2*b^4*c^3*d - 12*B^2*a*b^3*c^2*d^
2 - 108*B^2*a^2*b^2*c*d^3 + 115*B^2*a^3*b*d^4)*i^n^2 - 12*(A*B*b^4*c^3*d -
6*A*B*a*b^3*c^2*d^2 + 18*A*B*a^2*b^2*c*d^3 - 13*A*B*a^3*b*d^4)*i^n - 72*(A^
2*b^4*c^3*d - 3*A^2*a*b^3*c^2*d^2 + 3*A^2*a^2*b^2*c*d^3 - A^2*a^3*b*d^4)*i)
*x + 12*(12*(B^2*b^4*c*d^3 - B^2*a*b^3*d^4)*i^n*x^3 - 6*(B^2*b^4*c^2*d^2 -
8*B^2*a*b^3*c*d^3 + 7*B^2*a^2*b^2*d^4)*i^n*x^2 + (9*B^2*b^4*c^4 - 32*B^2*a*
b^3*c^3*d + 36*B^2*a^2*b^2*c^2*d^2 - 13*B^2*a^4*d^4)*i^n + 12*(3*A*B*b^4*c^
4 - 8*A*B*a*b^3*c^3*d + 6*A*B*a^2*b^2*c^2*d^2 - A*B*a^4*d^4)*i + 4*((B^2*b^
4*c^3*d - 6*B^2*a*b^3*c^2*d^2 + 18*B^2*a^2*b^2*c*d^3 - 13*B^2*a^3*b*d^4)*i*
n + 12*(A*B*b^4*c^3*d - 3*A*B*a*b^3*c^2*d^2 + 3*A*B*a^2*b^2*c*d^3 - A*B*a^3
*b*d^4)*i)*x + 12*(B^2*b^4*d^4*i^n*x^4 + 4*B^2*a*b^3*d^4*i^n*x^3 + 6*B^2*a^
2*b^2*d^4*i^n*x^2 + 4*(B^2*b^4*c^3*d - 3*B^2*a*b^3*c^2*d^2 + 3*B^2*a^2*b^2*
c*d^3)*i^n*x + (3*B^2*b^4*c^4 - 8*B^2*a*b^3*c^3*d + 6*B^2*a^2*b^2*c^2*d^2)*
i^n)*log((b*x + a)/(d*x + c))*log(e) + 12*((13*B^2*b^4*d^4*i^n^2 + 12*A*B*
b^4*d^4*i^n)*x^4 + (9*B^2*b^4*c^4 - 32*B^2*a*b^3*c^3*d + 36*B^2*a^2*b^2*c^2
*d^2)*i^n^2 + 4*(12*A*B*a*b^3*d^4*i^n + (3*B^2*b^4*c*d^3 + 10*B^2*a*b^3*d^4
)*i^n^2)*x^3 + 12*(3*A*B*b^4*c^4 - 8*A*B*a*b^3*c^3*d + 6*A*B*a^2*b^2*c^2*d^
2)*i^n + 6*(12*A*B*a^2*b^2*d^4*i^n - (B^2*b^4*c^2*d^2 - 8*B^2*a*b^3*c*d^3 -
6*B^2*a^2*b^2*d^4)*i^n^2)*x^2 + 4*((B^2*b^4*c^3*d - 6*B^2*a*b^3*c^2*d^2 +
18*B^2*a^2*b^2*c*d^3)*i^n^2 + 12*(A*B*b^4*c^3*d - 3*A*B*a*b^3*c^2*d^2 + 3*A
*B*a^2*b^2*c*d^3)*i^n)*x)*log((b*x + a)/(d*x + c))/((b^9*c^3 - 3*a*b^8*c^2
*d + 3*a^2*b^7*c*d^2 - a^3*b^6*d^3)*g^5*x^4 + 4*(a*b^8*c^3 - 3*a^2*b^7*c^2*
d + 3*a^3*b^6*c*d^2 - a^4*b^5*d^3)*g^5*x^3 + 6*(a^2*b^7*c^3 - 3*a^3*b^6*c^2
*d + 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)*g^5*x^2 + 4*(a^3*b^6*c^3 - 3*a^4*b^5*c^
2*d + 3*a^5*b^4*c*d^2 - a^6*b^3*d^3)*g^5*x + (a^4*b^5*c^3 - 3*a^5*b^4*c^2*d
+ 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*g^5)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n))\*\*2/(b\*g\*x+a\*g)\*\*5,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci) \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2}{(bgx + ag)^5} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^5,x, algorithm="giac")

[Out] integrate((d\*i\*x + c\*i)\*(B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)^2/(b\*g\*x + a\*g)^5, x)

$$3.168 \quad \int (ag+bgx)^3(ci+dix)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx$$

**Optimal.** Leaf size=766

$$\frac{B^2 g^3 i^2 n^2 (bc - ad)^6 \text{PolyLog} \left( 2, \frac{d(a+bx)}{b(c+dx)} \right)}{30b^3 d^4} - \frac{B g^3 i^2 n (bc - ad)^6 \log \left( \frac{bc-ad}{b(c+dx)} \right) \left( 6B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + 6A + 11Bn \right)}{180b^3 d^4} - \frac{B g^3 i^2 n (bc - ad)^6 \log \left( \frac{bc-ad}{b(c+dx)} \right)}{180b^3 d^4}$$

[Out]  $(3*B^2*(b*c - a*d)^5*g^3*i^2*n^2*x)/(20*b^2*d^3) + (B^2*(b*c - a*d)^2*g^3*i^2*n^2*(a + b*x)^4)/(60*b^3) - (3*B^2*(b*c - a*d)^4*g^3*i^2*n^2*(c + d*x)^2)/(40*b*d^4) + (B^2*(b*c - a*d)^3*g^3*i^2*n^2*(c + d*x)^3)/(60*d^4) - (B*(b*c - a*d)^3*g^3*i^2*n*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(90*b^3*d) - (B*(b*c - a*d)^2*g^3*i^2*n*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(20*b^3) - (B*(b*c - a*d)*g^3*i^2*n*(a + b*x)^4*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(15*b^2) + ((b*c - a*d)^2*g^3*i^2*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))^2/(60*b^3) + ((b*c - a*d)*g^3*i^2*(a + b*x)^4*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))^2/(15*b^2) + (g^3*i^2*(a + b*x)^4*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))^2/(6*b) + (B*(b*c - a*d)^4*g^3*i^2*n*(a + b*x)^2*(3*A + B*n + 3*B*Log[e*((a + b*x)/(c + d*x))^n]))/(180*b^3*d^2) - (B*(b*c - a*d)^5*g^3*i^2*n*(a + b*x)*(6*A + 5*B*n + 6*B*Log[e*((a + b*x)/(c + d*x))^n]))/(180*b^3*d^3) - (B*(b*c - a*d)^6*g^3*i^2*n*(6*A + 11*B*n + 6*B*Log[e*((a + b*x)/(c + d*x))^n]))*Log[(b*c - a*d)/(b*(c + d*x))]/(180*b^3*d^4) - (B^2*(b*c - a*d)^6*g^3*i^2*n^2*Log[c + d*x]/(20*b^3*d^4) - (B^2*(b*c - a*d)^6*g^3*i^2*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/((30*b^3*d^4)$

**Rubi [A]** time = 3.34846, antiderivative size = 848, normalized size of antiderivative = 1.11, number of steps used = 83, number of rules used = 13, integrand size = 45,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.289$ , Rules used = {2528, 2525, 12, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{B^2 g^3 i^2 n^2 \log^2(c + dx)(bc - ad)^6}{60b^3 d^4} + \frac{B^2 g^3 i^2 n^2 \log(c + dx)(bc - ad)^6}{90b^3 d^4} - \frac{B^2 g^3 i^2 n^2 \log \left( -\frac{d(a+bx)}{bc-ad} \right) \log(c + dx)(bc - ad)^6}{30b^3 d^4} + \frac{B g^3 i^2 n (bc - ad)^6 \log \left( \frac{bc-ad}{b(c+dx)} \right)}{180b^3 d^4}$$

Antiderivative was successfully verified.

[In] Int[(a\*g + b\*g\*x)^3\*(c\*i + d\*i\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2,x]

[Out]  $-(A*B*(b*c - a*d)^5*g^3*i^2*n*x)/(30*b^2*d^3) + (B^2*(b*c - a*d)^5*g^3*i^2*n^2*x)/(45*b^2*d^3) - (7*B^2*(b*c - a*d)^4*g^3*i^2*n^2*(a + b*x)^2)/(360*b^2*d^3)$

$$\begin{aligned}
& 3*d^2) + (B^2*(b*c - a*d)^3*g^3*i^2*n^2*(a + b*x)^3)/(60*b^3*d) + (B^2*(b*c \\
& - a*d)^2*g^3*i^2*n^2*(a + b*x)^4)/(60*b^3) - (B^2*(b*c - a*d)^5*g^3*i^2*n* \\
& (a + b*x)*\text{Log}[e*((a + b*x)/(c + d*x))^n])/(30*b^3*d^3) + (B*(b*c - a*d)^4*g \\
& ^3*i^2*n*(a + b*x)^2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]))/(60*b^3*d^2) - \\
& (B*(b*c - a*d)^3*g^3*i^2*n*(a + b*x)^3*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^ \\
& n]))/(90*b^3*d) - (7*B*(b*c - a*d)^2*g^3*i^2*n*(a + b*x)^4*(A + B*\text{Log}[e*((a \\
& + b*x)/(c + d*x))^n]))/(60*b^3) - (B*d*(b*c - a*d)*g^3*i^2*n*(a + b*x)^5*( \\
& A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]))/(15*b^3) + ((b*c - a*d)^2*g^3*i^2*(a \\
& + b*x)^4*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2)/(4*b^3) + (2*d*(b*c - a \\
& *d)*g^3*i^2*(a + b*x)^5*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2)/(5*b^3) + \\
& (d^2*g^3*i^2*(a + b*x)^6*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2)/(6*b^3) \\
& + (B^2*(b*c - a*d)^6*g^3*i^2*n^2*\text{Log}[c + d*x])/(90*b^3*d^4) - (B^2*(b*c - \\
& a*d)^6*g^3*i^2*n^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/(30*b^3* \\
& d^4) + (B*(b*c - a*d)^6*g^3*i^2*n*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])* \\
& \text{Log}[c + d*x])/(30*b^3*d^4) + (B^2*(b*c - a*d)^6*g^3*i^2*n^2*\text{Log}[c + d*x]^2)/( \\
& 60*b^3*d^4) - (B^2*(b*c - a*d)^6*g^3*i^2*n^2*\text{PolyLog}[2, (b*(c + d*x))/(b*c \\
& - a*d)])/(30*b^3*d^4)
\end{aligned}$$

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]

```

### Rule 2525

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]

```

### Rule 12

```

Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]

```

### Rule 2486

```

Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.)
^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)
^q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q]^r]^s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s

```



, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]

### Rule 31

Int[((a\_) + (b\_)\*(x\_))<sup>(-1)</sup>, x\_Symbol] := Simp[Log[RemoveContent[a + b\*x, x]]/b, x] /; FreeQ[{a, b}, x]

### Rule 43

Int[((a\_) + (b\_)\*(x\_))<sup>(m\_)</sup>\*((c\_) + (d\_)\*(x\_))<sup>(n\_)</sup>, x\_Symbol] := Int[ExpandIntegrand[(a + b\*x)<sup>m</sup>\*(c + d\*x)<sup>n</sup>, x], x] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b\*c - a\*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && LeQ[7\*m + 4\*n + 4, 0]) || LtQ[9\*m + 5\*(n + 1), 0] || GtQ[m + n + 2, 0])

### Rule 2524

Int[((a\_) + Log[(c\_)\*(RFx\_)<sup>(p\_)</sup>]\*(b\_))<sup>(n\_)</sup>/((d\_) + (e\_)\*(x\_)), x\_Symbol] := Simp[(Log[d + e\*x]\*(a + b\*Log[c\*RFx<sup>p</sup>])<sup>n</sup>/e, x] - Dist[(b\*n\*p)/e, Int[(Log[d + e\*x]\*(a + b\*Log[c\*RFx<sup>p</sup>])<sup>(n - 1)</sup>\*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

### Rule 2418

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_))<sup>(n\_)</sup>]\*(b\_))<sup>(p\_)</sup>\*(RFx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)<sup>n</sup>])<sup>p</sup>, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]

### Rule 2394

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_))<sup>(n\_)</sup>]\*(b\_))/((f\_) + (g\_)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)<sup>n</sup>])/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_))]\*(b\_))/((f\_) + (g\_)\*(x\_)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]*(b_.))^(p_.)*((f_) + (g_.)*(x_)^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rubi steps

$$\begin{aligned}
\int (168c + 168dx)^2 (ag + bgx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx &= \int \left( \frac{28224(bc - ad)^2 (ag + bgx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2} \right) dx \\
&= \frac{(28224(bc - ad)^2) \int (ag + bgx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2} \\
&= \frac{7056(bc - ad)^2 g^3 (a + bx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3} + \\
&= \frac{7056(bc - ad)^2 g^3 (a + bx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3} + \\
&= \frac{7056(bc - ad)^2 g^3 (a + bx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3} + \\
&= \frac{7056(bc - ad)^2 g^3 (a + bx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3} + \\
&= -\frac{4704AB(bc - ad)^5 g^3 nx}{5b^2 d^3} + \frac{2352B(bc - ad)^4 g^3 n(a + bx)}{5b^2 d^3} \\
&= -\frac{4704AB(bc - ad)^5 g^3 nx}{5b^2 d^3} - \frac{4704B^2(bc - ad)^5 g^3 n(a + bx)}{5b^3 d^3} \\
&= -\frac{4704AB(bc - ad)^5 g^3 nx}{5b^2 d^3} - \frac{4704B^2(bc - ad)^5 g^3 n(a + bx)}{5b^3 d^3} \\
&= -\frac{4704AB(bc - ad)^5 g^3 nx}{5b^2 d^3} + \frac{3136B^2(bc - ad)^5 g^3 n^2 x}{5b^2 d^3} - \frac{4704B^2(bc - ad)^5 g^3 n(a + bx)}{5b^3 d^3} \\
&= -\frac{4704AB(bc - ad)^5 g^3 nx}{5b^2 d^3} + \frac{3136B^2(bc - ad)^5 g^3 n^2 x}{5b^2 d^3} - \frac{4704B^2(bc - ad)^5 g^3 n(a + bx)}{5b^3 d^3} \\
&= -\frac{4704AB(bc - ad)^5 g^3 nx}{5b^2 d^3} + \frac{3136B^2(bc - ad)^5 g^3 n^2 x}{5b^2 d^3} - \frac{4704B^2(bc - ad)^5 g^3 n(a + bx)}{5b^3 d^3}
\end{aligned}$$

**Mathematica [B]** time = 1.44315, size = 1634, normalized size = 2.13

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))
]^n))^2,x]
```

```
[Out] (g^3*i^2*(15*(b*c - a*d)^2*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))
]^n))^2 + 24*d*(b*c - a*d)*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))
]^n))^2 + 10*d^2*(a + b*x)^6*(A + B*Log[e*((a + b*x)/(c + d*x))
]^n))^2 - (5*B*(b*c - a*d)^3*n*(6*A*b*d*(b*c - a*d)^2*x + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[e*
((a + b*x)/(c + d*x))^n] + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))
]^n)) + 2*d^3*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))
]^n)) - 6*B*(b*c - a*d)^3*n*Log[c + d*x] - 6*(b*c - a*d)^3*(A + B*Log[e*((a + b*x)/(c + d*x))
]^n)*Log[c + d*x] + B*(b*c - a*d)*n*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + 3*B*(b*c - a*d)^2*n*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + 3*B*(b*c - a*d)^3*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/d^4 + (2*B*(b*c - a*d)^2*n*(24*A*b*d*(b*c - a*d)^3*x + 24*B*d*(b*c - a*d)^3*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] - 12*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 8*d^3*(b*c - a*d)*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 6*d^4*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 24*B*(b*c - a*d)^4*n*Log[c + d*x] - 24*(b*c - a*d)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + 4*B*(b*c - a*d)^2*n*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + B*(b*c - a*d)*n*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 + 2*d^3*(a + b*x)^3 - 6*(b*c - a*d)^3*Log[c + d*x]) + 12*B*(b*c - a*d)^3*n*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + 12*B*(b*c - a*d)^4*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/d^4 - (B*(b*c - a*d)*n*(120*A*b*d*(b*c - a*d)^4*x + 120*B*d*(b*c - a*d)^4*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] + 60*d^2*(-(b*c) + a*d)^3*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 40*d^3*(b*c - a*d)^2*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 30*d^4*(-(b*c) + a*d)*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 24*d^5*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 120*B*(b*c - a*d)^5*n*Log[c + d*x] - 120*(b*c - a*d)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + 20*B*(b*c - a*d)^3*n*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + 5*B*(b*c - a*d)^2*n*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 + 2*d^3*(a + b*x)^3 - 6*(b*c - a*d)^3*Log[c + d*x]) + 2*B*(b*c - a*d)*n*(12*b*d*(b*c - a*d)^3*x - 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 4*d^3*(b*c - a*d)*(a + b*x)^3 - 3*d^4*(a + b*x)^4 - 12*(b*c - a*d)^4*Log[c + d*x]) + 60*B*(b*c - a*d)^4*n*(b*d*x + (-(
```

$b*c) + a*d)*\text{Log}[c + d*x]) + 60*B*(b*c - a*d)^5*n*((2*\text{Log}[(d*(a + b*x))/(-b*c) + a*d]) - \text{Log}[c + d*x])*\text{Log}[c + d*x] + 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d])]))/(6*d^4)))/(60*b^3)$

**Maple [F]** time = 0.734, size = 0, normalized size = 0.

$$\int (bgx + ag)^3 (dix + ci)^2 \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)`

[Out] `int((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)`

**Maxima [B]** time = 4.16418, size = 8035, normalized size = 10.49

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*g*x+a*g)^3*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="maxima")`

[Out]  $1/3*A*B*b^3*d^2*g^3*i^2*x^6*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/6*A^2*b^3*d^2*g^3*i^2*x^6 + 4/5*A*B*b^3*c*d*g^3*i^2*x^5*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 6/5*A*B*a*b^2*d^2*g^3*i^2*x^5*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 2/5*A^2*b^3*c*d*g^3*i^2*x^5 + 3/5*A^2*a*b^2*d^2*g^3*i^2*x^5 + 1/2*A*B*b^3*c^2*g^3*i^2*x^4*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3*A*B*a*b^2*c*d*g^3*i^2*x^4*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/2*A*B*a^2*b*d^2*g^3*i^2*x^4*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/4*A^2*b^3*c^2*g^3*i^2*x^4 + 3/2*A^2*a*b^2*c*d*g^3*i^2*x^4 + 3/4*A^2*a^2*b*d^2*g^3*i^2*x^4 + 2*A*B*a*b^2*c^2*g^3*i^2*x^3*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 4*A*B*a^2*b*c*d*g^3*i^2*x^3*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 2/3*A*B*a^3*d^2*g^3*i^2*x^3*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*a*b^2*c^2*g^3*i^2*x^3 + 2*A^2*a^2*b*c*d*g^3*i^2*x^3 + 1/3*A^2*a^3*d^2*g^3*i^2*x^3 + 3*A*B*a^2*b*c^2*g^3*i^2*x^2*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 2*A*B*a^3*c*d*g^3*i^2*x^2*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/2*A^2*a^2*b*c^2*g^3*i^2*x^2 + A^2*a^3*c*d*g^3*i^2*x^2 - 1/180*A*B*b^3*d^2*g^3*i^2*n*(60*$

$$\begin{aligned}
& a^6 \log(bx + a)/b^6 - 60c^6 \log(dx + c)/d^6 + (12*(b^5*c*d^4 - a*b^4*d^5) \\
& ) * x^5 - 15*(b^5*c^2*d^3 - a^2*b^3*d^5) * x^4 + 20*(b^5*c^3*d^2 - a^3*b^2*d^5) \\
& * x^3 - 30*(b^5*c^4*d - a^4*b*d^5) * x^2 + 60*(b^5*c^5 - a^5*d^5) * x / (b^5*d^5) \\
& ) + 1/15 * A * B * b^3 * c * d * g^3 * i^2 * n * (12 * a^5 * \log(bx + a) / b^5 - 12 * c^5 * \log(dx + \\
& c) / d^5 - (3 * (b^4 * c * d^3 - a * b^3 * d^4) * x^4 - 4 * (b^4 * c^2 * d^2 - a^2 * b^2 * d^4) * x^3 \\
& + 6 * (b^4 * c^3 * d - a^3 * b * d^4) * x^2 - 12 * (b^4 * c^4 - a^4 * d^4) * x) / (b^4 * d^4)) + 1 \\
& / 10 * A * B * a * b^2 * d^2 * g^3 * i^2 * n * (12 * a^5 * \log(bx + a) / b^5 - 12 * c^5 * \log(dx + c) / \\
& d^5 - (3 * (b^4 * c * d^3 - a * b^3 * d^4) * x^4 - 4 * (b^4 * c^2 * d^2 - a^2 * b^2 * d^4) * x^3 + \\
& 6 * (b^4 * c^3 * d - a^3 * b * d^4) * x^2 - 12 * (b^4 * c^4 - a^4 * d^4) * x) / (b^4 * d^4)) - 1/12 \\
& * A * B * b^3 * c^2 * g^3 * i^2 * n * (6 * a^4 * \log(bx + a) / b^4 - 6 * c^4 * \log(dx + c) / d^4 + ( \\
& 2 * (b^3 * c * d^2 - a * b^2 * d^3) * x^3 - 3 * (b^3 * c^2 * d - a^2 * b * d^3) * x^2 + 6 * (b^3 * c^3 \\
& - a^3 * d^3) * x) / (b^3 * d^3)) - 1/2 * A * B * a * b^2 * c * d * g^3 * i^2 * n * (6 * a^4 * \log(bx + a) / \\
& b^4 - 6 * c^4 * \log(dx + c) / d^4 + (2 * (b^3 * c * d^2 - a * b^2 * d^3) * x^3 - 3 * (b^3 * c^2 * \\
& d - a^2 * b * d^3) * x^2 + 6 * (b^3 * c^3 - a^3 * d^3) * x) / (b^3 * d^3)) - 1/4 * A * B * a^2 * b * d^ \\
& 2 * g^3 * i^2 * n * (6 * a^4 * \log(bx + a) / b^4 - 6 * c^4 * \log(dx + c) / d^4 + (2 * (b^3 * c * d^ \\
& 2 - a * b^2 * d^3) * x^3 - 3 * (b^3 * c^2 * d - a^2 * b * d^3) * x^2 + 6 * (b^3 * c^3 - a^3 * d^3) * \\
& x) / (b^3 * d^3)) + A * B * a * b^2 * c^2 * g^3 * i^2 * n * (2 * a^3 * \log(bx + a) / b^3 - 2 * c^3 * \log \\
& (dx + c) / d^3 - ((b^2 * c * d - a * b * d^2) * x^2 - 2 * (b^2 * c^2 - a^2 * d^2) * x) / (b^2 * d^ \\
& 2)) + 2 * A * B * a^2 * b * c * d * g^3 * i^2 * n * (2 * a^3 * \log(bx + a) / b^3 - 2 * c^3 * \log(dx + c \\
& ) / d^3 - ((b^2 * c * d - a * b * d^2) * x^2 - 2 * (b^2 * c^2 - a^2 * d^2) * x) / (b^2 * d^2)) + 1/ \\
& 3 * A * B * a^3 * d^2 * g^3 * i^2 * n * (2 * a^3 * \log(bx + a) / b^3 - 2 * c^3 * \log(dx + c) / d^3 - \\
& ((b^2 * c * d - a * b * d^2) * x^2 - 2 * (b^2 * c^2 - a^2 * d^2) * x) / (b^2 * d^2)) - 3 * A * B * a^2 * \\
& b * c^2 * g^3 * i^2 * n * (a^2 * \log(bx + a) / b^2 - c^2 * \log(dx + c) / d^2 + (b * c - a * d) * \\
& x / (b * d)) - 2 * A * B * a^3 * c * d * g^3 * i^2 * n * (a^2 * \log(bx + a) / b^2 - c^2 * \log(dx + c) \\
& / d^2 + (b * c - a * d) * x / (b * d)) + 2 * A * B * a^3 * c^2 * g^3 * i^2 * n * (a * \log(bx + a) / b - c \\
& * \log(dx + c) / d) + 2 * A * B * a^3 * c^2 * g^3 * i^2 * x * \log(e * (bx / (dx + c) + a / (dx + \\
& c)))^n + A^2 * a^3 * c^2 * g^3 * i^2 * x - 1/180 * (33 * a^4 * b * c^2 * d^4 * g^3 * i^2 * n^2 - 6 * a^ \\
& 5 * c * d^5 * g^3 * i^2 * n^2 - 2 * (g^3 * i^2 * n^2 + 3 * g^3 * i^2 * n * \log(e)) * b^5 * c^6 + 6 * (g^3 \\
& * i^2 * n^2 + 6 * g^3 * i^2 * n * \log(e)) * a * b^4 * c^5 * d + 3 * (g^3 * i^2 * n^2 - 30 * g^3 * i^2 * n * \\
& \log(e)) * a^2 * b^3 * c^4 * d^2 - 2 * (17 * g^3 * i^2 * n^2 - 60 * g^3 * i^2 * n * \log(e)) * a^3 * b^2 * \\
& c^3 * d^3) * B^2 * \log(dx + c) / (b^2 * d^4) + 1/30 * (b^6 * c^6 * g^3 * i^2 * n^2 - 6 * a * b^5 * c \\
& ^5 * d * g^3 * i^2 * n^2 + 15 * a^2 * b^4 * c^4 * d^2 * g^3 * i^2 * n^2 - 20 * a^3 * b^3 * c^3 * d^3 * g^3 * \\
& i^2 * n^2 + 15 * a^4 * b^2 * c^2 * d^4 * g^3 * i^2 * n^2 - 6 * a^5 * b * c * d^5 * g^3 * i^2 * n^2 + a^6 * \\
& d^6 * g^3 * i^2 * n^2) * (\log(bx + a) * \log((b * d * x + a * d) / (b * c - a * d)) + 1) + \operatorname{dilog}(- \\
& (b * d * x + a * d) / (b * c - a * d)) * B^2 / (b^3 * d^4) + 1/360 * (60 * B^2 * b^6 * d^6 * g^3 * i^2 * x \\
& ^6 * \log(e)^2 - 24 * ((g^3 * i^2 * n * \log(e) - 6 * g^3 * i^2 * \log(e)^2) * b^6 * c * d^5 - (g^3 * \\
& i^2 * n * \log(e) + 9 * g^3 * i^2 * \log(e)^2) * a * b^5 * d^6) * B^2 * x^5 + 6 * ((g^3 * i^2 * n^2 - 7 \\
& * g^3 * i^2 * n * \log(e) + 15 * g^3 * i^2 * \log(e)^2) * b^6 * c^2 * d^4 - 2 * (g^3 * i^2 * n^2 + 3 * g \\
& ^3 * i^2 * n * \log(e) - 45 * g^3 * i^2 * \log(e)^2) * a * b^5 * c * d^5 + (g^3 * i^2 * n^2 + 13 * g^3 * \\
& i^2 * n * \log(e) + 45 * g^3 * i^2 * \log(e)^2) * a^2 * b^4 * d^6) * B^2 * x^4 + 2 * ((3 * g^3 * i^2 * n^ \\
& 2 - 2 * g^3 * i^2 * n * \log(e)) * b^6 * c^3 * d^3 + 3 * (g^3 * i^2 * n^2 - 26 * g^3 * i^2 * n * \log(e) \\
& + 60 * g^3 * i^2 * \log(e)^2) * a * b^5 * c^2 * d^4 - 3 * (5 * g^3 * i^2 * n^2 - 14 * g^3 * i^2 * n * \log( \\
& e) - 120 * g^3 * i^2 * \log(e)^2) * a^2 * b^4 * c * d^5 + (9 * g^3 * i^2 * n^2 + 38 * g^3 * i^2 * n * \log \\
& (e) + 60 * g^3 * i^2 * \log(e)^2) * a^3 * b^3 * d^6) * B^2 * x^3 - ((7 * g^3 * i^2 * n^2 - 6 * g^3 * \\
& i^2 * n * \log(e)) * b^6 * c^4 * d^2 - 2 * (23 * g^3 * i^2 * n^2 - 18 * g^3 * i^2 * n * \log(e)) * a * b^5 *
\end{aligned}$$

$$\begin{aligned}
& c^3 d^3 + 60(g^3 i^2 n^2 + 3g^3 i^2 n \log(e) - 9g^3 i^2 \log(e)^2) a^2 b^4 c^2 d^4 - 2(5g^3 i^2 n^2 + 102g^3 i^2 n \log(e) + 180g^3 i^2 \log(e)^2) \\
& a^3 b^3 c d^5 - (11g^3 i^2 n^2 + 6g^3 i^2 n \log(e)) a^4 b^2 d^6) B^2 x^2 \\
& - 6(15a^4 b^2 c^2 d^4 g^3 i^2 n^2 - 6a^5 b c d^5 g^3 i^2 n^2 + a^6 d^6 g^3 i^2 n^2) B^2 \log(bx + a)^2 - 12(b^6 c^6 g^3 i^2 n^2 - 6a b^5 c^5 d g^3 i^2 n^2 + 15a^2 b^4 c^4 d^2 g^3 i^2 n^2 - 20a^3 b^3 c^3 d^3 g^3 i^2 n^2) \\
& B^2 \log(bx + a) \log(dx + c) + 6(b^6 c^6 g^3 i^2 n^2 - 6a b^5 c^5 d g^3 i^2 n^2 + 15a^2 b^4 c^4 d^2 g^3 i^2 n^2 - 20a^3 b^3 c^3 d^3 g^3 i^2 n^2) B^2 \log(dx + c)^2 + 2(2(2g^3 i^2 n^2 - 3g^3 i^2 n \log(e)) b^6 c^5 d \\
& - 9(3g^3 i^2 n^2 - 4g^3 i^2 n \log(e)) a b^5 c^4 d^2 + (77g^3 i^2 n^2 - 90g^3 i^2 n \log(e)) a^2 b^4 c^3 d^3 - (97g^3 i^2 n^2 - 30g^3 i^2 n \log(e) - 180g^3 i^2 \log(e)^2) a^3 b^3 c^2 d^4 + 3(17g^3 i^2 n^2 + 12g^3 i^2 n \log(e)) a^4 b^2 c d^5 - 2(4g^3 i^2 n^2 + 3g^3 i^2 n \log(e)) a^5 b d^6) \\
& B^2 x - 2(6a b^5 c^5 d g^3 i^2 n^2 - 33a^2 b^4 c^4 d^2 g^3 i^2 n^2 + 74a^3 b^3 c^3 d^3 g^3 i^2 n^2 - 9(7g^3 i^2 n^2 + 10g^3 i^2 n \log(e)) a^4 b^2 c^2 d^4 + 18(g^3 i^2 n^2 + 2g^3 i^2 n \log(e)) a^5 b c d^5 - 2(g^3 i^2 n^2 + 3g^3 i^2 n \log(e)) a^6 d^6) B^2 \log(bx + a) + 6(10B^2 b^6 d^6 g^3 i^2 x^6 + 60B^2 a^3 b^3 c^2 d^4 g^3 i^2 x + 12(2b^6 c d^5 g^3 i^2 + 3a b^5 d^6 g^3 i^2) B^2 x^5 + 15(b^6 c^2 d^4 g^3 i^2 + 6a b^5 c d^5 g^3 i^2 + 3a^2 b^4 d^6 g^3 i^2) B^2 x^4 + 20(3a b^5 c^2 d^4 g^3 i^2 + 6a^2 b^4 c d^5 g^3 i^2 + a^3 b^3 d^6 g^3 i^2) B^2 x^3 + 30(3a^2 b^4 c^2 d^4 g^3 i^2 + 2a^3 b^3 c d^5 g^3 i^2) B^2 x^2) \log((bx + a)^n)^2 + 6(10B^2 b^6 d^6 g^3 i^2 x^6 + 60B^2 a^3 b^3 c^2 d^4 g^3 i^2 x + 12(2b^6 c d^5 g^3 i^2 + 3a b^5 d^6 g^3 i^2) B^2 x^5 + 15(b^6 c^2 d^4 g^3 i^2 + 6a b^5 c d^5 g^3 i^2 + 3a^2 b^4 d^6 g^3 i^2) B^2 x^4 + 20(3a b^5 c^2 d^4 g^3 i^2 + 6a^2 b^4 c d^5 g^3 i^2 + a^3 b^3 d^6 g^3 i^2) B^2 x^3 + 30(3a^2 b^4 c^2 d^4 g^3 i^2 + 2a^3 b^3 c d^5 g^3 i^2) B^2 x^2) \log((dx + c)^n)^2 + 2(60B^2 b^6 d^6 g^3 i^2 x^6 \log(e) - 12((g^3 i^2 n - 12g^3 i^2 \log(e)) b^6 c d^5 - (g^3 i^2 n + 18g^3 i^2 \log(e)) a b^5 d^6) B^2 x^5 - 3((7g^3 i^2 n - 30g^3 i^2 \log(e)) b^6 c^2 d^4 + 6(g^3 i^2 n - 30g^3 i^2 \log(e)) a b^5 c d^5 - (13g^3 i^2 n + 90g^3 i^2 \log(e)) a^2 b^4 d^6) B^2 x^4 - 2(b^6 c^3 d^3 g^3 i^2 n + 3(13g^3 i^2 n - 60g^3 i^2 \log(e)) a b^5 c^2 d^4 - 3(7g^3 i^2 n + 120g^3 i^2 \log(e)) a^2 b^4 c d^5 - (19g^3 i^2 n + 60g^3 i^2 \log(e)) a^3 b^3 d^6) B^2 x^3 + 3(b^6 c^4 d^2 g^3 i^2 n - 6a b^5 c^3 d^3 g^3 i^2 n + a^4 b^2 d^6 g^3 i^2 n - 30(g^3 i^2 n - 6g^3 i^2 \log(e)) a^2 b^4 c^2 d^4 + 2(17g^3 i^2 n + 60g^3 i^2 \log(e)) a^3 b^3 c d^5) B^2 x^2 - 6(b^6 c^5 d g^3 i^2 n - 6a b^5 c^4 d^2 g^3 i^2 n + 15a^2 b^4 c^3 d^3 g^3 i^2 n - 6a^4 b^2 c d^5 g^3 i^2 n + a^5 b d^6 g^3 i^2 n - 5(g^3 i^2 n + 12g^3 i^2 \log(e)) a^3 b^3 c^2 d^4) B^2 x + 6(15a^4 b^2 c^2 d^4 g^3 i^2 n - 6a^5 b c d^5 g^3 i^2 n + a^6 d^6 g^3 i^2 n) B^2 \log(bx + a) + 6(b^6 c^6 g^3 i^2 n - 6a b^5 c^5 d g^3 i^2 n + 15a^2 b^4 c^4 d^2 g^3 i^2 n - 20a^3 b^3 c^3 d^3 g^3 i^2 n) B^2 \log(dx + c) \log((bx + a)^n) - 2(60B^2 b^6 d^6 g^3 i^2 x^6 \log(e) - 12((g^3 i^2 n - 12g^3 i^2 \log(e)) b^6 c d^5 - (g^3 i^2 n + 18g^3 i^2 \log(e)) a b^5 d^6) B^2 x^5 - 3((7g^3 i^2 n - 30g^3 i^2 \log(e)) b^6 c^2 d^4 + 6(g^3 i^2 n - 30g^3 i^2 \log(e)) a b^5 c d^5
\end{aligned}$$

$$\begin{aligned}
& - (13g^3i^2n + 90g^3i^2\log(e))a^2b^4d^6)B^2x^4 - 2(b^6c^3d^3g^3i^2n + 3(13g^3i^2n - 60g^3i^2\log(e))ab^5c^2d^4 - 3(7g^3i^2n + 120g^3i^2\log(e))a^2b^4cd^5 - (19g^3i^2n + 60g^3i^2\log(e)))a^3b^3d^6)B^2x^3 + 3(b^6c^4d^2g^3i^2n - 6ab^5c^3d^3g^3i^2n + a^4b^2d^6g^3i^2n - 30(g^3i^2n - 6g^3i^2\log(e))a^2b^4c^2d^4 + 2(17g^3i^2n + 60g^3i^2\log(e))a^3b^3cd^5)B^2x^2 - 6(b^6c^5d^2g^3i^2n - 6ab^5c^4d^2g^3i^2n + 15a^2b^4c^3d^3g^3i^2n - 6a^4b^2cd^5g^3i^2n + a^5bd^6g^3i^2n - 5(g^3i^2n + 12g^3i^2\log(e))a^3b^3c^2d^4)B^2x + 6(15a^4b^2c^2d^4g^3i^2n - 6a^5b^3cd^5g^3i^2n + a^6d^6g^3i^2n)B^2\log(bx + a) + 6(b^6c^6g^3i^2n - 6ab^5c^5d^2g^3i^2n + 15a^2b^4c^4d^2g^3i^2n - 20a^3b^3c^3d^3g^3i^2n)B^2\log(dx + c) + 6(10B^2b^6d^6g^3i^2x^6 + 60B^2a^3b^3c^2d^4g^3i^2x + 12(2b^6cd^5g^3i^2 + 3ab^5d^6g^3i^2)B^2x^5 + 15(b^6c^2d^4g^3i^2 + 6ab^5cd^5g^3i^2 + 3a^2b^4d^6g^3i^2)B^2x^4 + 20(3ab^5c^2d^4g^3i^2 + 6a^2b^4cd^5g^3i^2 + a^3b^3d^6g^3i^2)B^2x^3 + 30(3a^2b^4c^2d^4g^3i^2 + 2a^3b^3cd^5g^3i^2)B^2x^2)\log((bx + a)^n)\log((dx + c)^n)/(b^3d^4)
\end{aligned}$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

integral  $\left( A^2b^3d^2g^3i^2x^5 + A^2a^3c^2g^3i^2 + (2A^2b^3cd + 3A^2ab^2d^2)g^3i^2x^4 + (A^2b^3c^2 + 6A^2ab^2cd + 3A^2a^2bd^2)g^3i^2x^3 + (3A^2a^3b^2d^2)g^3i^2x^2 + (3A^2a^2b^2c^2 + 6A^2a^2b^2cd + A^2a^3d^2)g^3i^2x + (3A^2a^2b^2c^2 + 2A^2a^3cd)g^3i^2x + (B^2b^3d^2g^3i^2x^5 + B^2a^3c^2g^3i^2 + (2B^2b^3cd + 3B^2ab^2d^2)g^3i^2x^4 + (B^2b^3c^2 + 6B^2ab^2cd + 3B^2a^2bd^2)g^3i^2x^3 + (3B^2ab^2c^2 + 6B^2a^2bcd + B^2a^3d^2)g^3i^2x^2 + (3B^2a^2b^2c^2 + 2B^2a^3cd)g^3i^2x)\log(e((bx + a)/(dx + c))^n)^2 + 2(A^2B^2b^3d^2g^3i^2x^5 + A^2B^2a^3c^2g^3i^2 + (2A^2B^2b^3cd + 3A^2B^2ab^2d^2)g^3i^2x^4 + (A^2B^2b^3c^2 + 6A^2B^2ab^2cd + 3A^2B^2a^2bd^2)g^3i^2x^3 + (3A^2B^2ab^2c^2 + 6A^2B^2a^2bcd + A^2B^2a^3d^2)g^3i^2x^2 + (3A^2B^2a^2b^2c^2 + 2A^2B^2a^3cd)g^3i^2x)\log(e((bx + a)/(dx + c))^n), x \right)$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2,x,  
algorithm="fricas")

[Out] integral(A^2\*b^3\*d^2\*g^3\*i^2\*x^5 + A^2\*a^3\*c^2\*g^3\*i^2 + (2\*A^2\*b^3\*c\*d + 3\*A^2\*a\*b^2\*d^2)\*g^3\*i^2\*x^4 + (A^2\*b^3\*c^2 + 6\*A^2\*a\*b^2\*c\*d + 3\*A^2\*a^2\*b\*d^2)\*g^3\*i^2\*x^3 + (3\*A^2\*a\*b^2\*c^2 + 6\*A^2\*a^2\*b\*c\*d + A^2\*a^3\*d^2)\*g^3\*i^2\*x^2 + (3\*A^2\*a^2\*b\*c^2 + 2\*A^2\*a^3\*c\*d)\*g^3\*i^2\*x + (B^2\*b^3\*d^2\*g^3\*i^2\*x^5 + B^2\*a^3\*c^2\*g^3\*i^2 + (2\*B^2\*b^3\*c\*d + 3\*B^2\*a\*b^2\*d^2)\*g^3\*i^2\*x^4 + (B^2\*b^3\*c^2 + 6\*B^2\*a\*b^2\*c\*d + 3\*B^2\*a^2\*b\*d^2)\*g^3\*i^2\*x^3 + (3\*B^2\*a\*b^2\*c^2 + 6\*B^2\*a^2\*b\*c\*d + B^2\*a^3\*d^2)\*g^3\*i^2\*x^2 + (3\*B^2\*a^2\*b^2\*c^2 + 2\*B^2\*a^3\*c\*d)\*g^3\*i^2\*x)\*log(e\*((b\*x + a)/(d\*x + c))^n)^2 + 2\*(A\*B\*b^3\*d^2\*g^3\*i^2\*x^5 + A\*B\*a^3\*c^2\*g^3\*i^2 + (2\*A\*B\*b^3\*c\*d + 3\*A\*B\*a\*b^2\*d^2)\*g^3\*i^2\*x^4 + (A\*B\*b^3\*c^2 + 6\*A\*B\*a\*b^2\*c\*d + 3\*A\*B\*a^2\*b\*d^2)\*g^3\*i^2\*x^3 + (3\*A\*B\*a\*b^2\*c^2 + 6\*A\*B\*a^2\*b\*c\*d + A\*B\*a^3\*d^2)\*g^3\*i^2\*x^2 + (3\*A\*B\*a^2\*b^2\*c^2 + 2\*A\*B\*a^3\*c\*d)\*g^3\*i^2\*x)\*log(e\*((b\*x + a)/(d\*x + c))^n), x)



**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*\*3\*(d\*i\*x+c\*i)\*\*2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n))\*\*2, x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int (bgx + ag)^3 (dix + ci)^2 \left( B \log \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) + A \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2, x, algorithm="giac")

[Out] integrate((b\*g\*x + a\*g)^3\*(d\*i\*x + c\*i)^2\*(B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)^2, x)

$$3.169 \quad \int (ag+bgx)^2(ci+dix)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx$$

**Optimal.** Leaf size=819

$$\frac{Bg^2i^2n \left( 2A + 3Bn + 2B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) \log \left( \frac{bc-ad}{b(c+dx)} \right) (bc-ad)^5}{30b^3d^3} + \frac{B^2g^2i^2n^2 \log \left( \frac{a+bx}{c+dx} \right) (bc-ad)^5}{30b^3d^3} + \frac{B^2g^2i^2n^2 \log(c+dx)}{10b^3d^3}$$

[Out]  $-(B^2(b*c - a*d)^4*g^2*i^2*n^2*x)/(10*b^2*d^2) - (B^2(b*c - a*d)^3*g^2*i^2*n^2*(c + d*x)^2)/(20*b*d^3) + (B^2(b*c - a*d)^2*g^2*i^2*n^2*(c + d*x)^3)/(30*d^3) - (B*(b*c - a*d)^3*g^2*i^2*n*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(30*b^3*d) - (B*(b*c - a*d)^2*g^2*i^2*n*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(15*b^3) - (B*(b*c - a*d)^3*g^2*i^2*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(5*b*d^3) + (4*B*(b*c - a*d)^2*g^2*i^2*n*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(15*d^3) - (b*B*(b*c - a*d)*g^2*i^2*n*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(10*d^3) + ((b*c - a*d)^2*g^2*i^2*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))^2/(30*b^3) + ((b*c - a*d)*g^2*i^2*(a + b*x)^3*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))^2/(10*b^2) + (g^2*i^2*(a + b*x)^3*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))^2/(5*b) + (B*(b*c - a*d)^4*g^2*i^2*n*(a + b*x)*(2*A + B*n + 2*B*Log[e*((a + b*x)/(c + d*x))^n]))/(30*b^3*d^2) + (B*(b*c - a*d)^5*g^2*i^2*n*(2*A + 3*B*n + 2*B*Log[e*((a + b*x)/(c + d*x))^n]))*Log[(b*c - a*d)/(b*(c + d*x))]/(30*b^3*d^3) + (B^2(b*c - a*d)^5*g^2*i^2*n^2*Log[(a + b*x)/(c + d*x)]/(30*b^3*d^3) + (B^2(b*c - a*d)^5*g^2*i^2*n^2*Log[c + d*x])/(10*b^3*d^3) + (B^2(b*c - a*d)^5*g^2*i^2*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(15*b^3*d^3)$

**Rubi [A]** time = 2.60906, antiderivative size = 714, normalized size of antiderivative = 0.87, number of steps used = 71, number of rules used = 13, integrand size = 45,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.289$ , Rules used = {2528, 2525, 12, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{B^2g^2i^2n^2(bc-ad)^5 \text{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right)}{15b^3d^3} - \frac{Bg^2i^2n(bc-ad)^5 \log(c+dx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{15b^3d^3} + \frac{d^2g^2i^2(a+bx)^5 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{5b^3}$$

Antiderivative was successfully verified.

[In] Int[(a\*g + b\*g\*x)^2\*(c\*i + d\*i\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2, x]

```
[Out] (A*B*(b*c - a*d)^4*g^2*i^2*n*x)/(15*b^2*d^2) - (B^2*(b*c - a*d)^4*g^2*i^2*n^2*x)/(15*b^2*d^2) + (B^2*(b*c - a*d)^3*g^2*i^2*n^2*(a + b*x)^2)/(20*b^3*d) + (B^2*(b*c - a*d)^2*g^2*i^2*n^2*(a + b*x)^3)/(30*b^3) + (B^2*(b*c - a*d)^4*g^2*i^2*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(15*b^3*d^2) - (B*(b*c - a*d)^3*g^2*i^2*n*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(30*b^3*d) - (B*(b*c - a*d)^2*g^2*i^2*n*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(5*b^3) - (B*d*(b*c - a*d)*g^2*i^2*n*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(10*b^3) + ((b*c - a*d)^2*g^2*i^2*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(3*b^3) + (d*(b*c - a*d)*g^2*i^2*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*b^3) + (d^2*g^2*i^2*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(5*b^3) + (B^2*(b*c - a*d)^5*g^2*i^2*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(15*b^3*d^3) - (B*(b*c - a*d)^5*g^2*i^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(15*b^3*d^3) - (B^2*(b*c - a*d)^5*g^2*i^2*n^2*Log[c + d*x]^2)/(30*b^3*d^3) + (B^2*(b*c - a*d)^5*g^2*i^2*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(15*b^3*d^3)
```

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_.))^(p_.))*((c_.) + (d_.)*(x_.))^(q_.)]^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}
```

}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]

### Rule 31

Int[((a\_) + (b\_)\*(x\_))<sup>(-1)</sup>, x\_Symbol] := Simp[Log[RemoveContent[a + b\*x, x]]/b, x] /; FreeQ[{a, b}, x]

### Rule 43

Int[((a\_) + (b\_)\*(x\_))<sup>(m\_)</sup>\*((c\_) + (d\_)\*(x\_))<sup>(n\_)</sup>, x\_Symbol] := Int[ExpandIntegrand[(a + b\*x)<sup>m</sup>\*(c + d\*x)<sup>n</sup>, x], x] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b\*c - a\*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && LeQ[7\*m + 4\*n + 4, 0]) || LtQ[9\*m + 5\*(n + 1), 0] || GtQ[m + n + 2, 0])

### Rule 2524

Int[((a\_) + Log[(c\_)\*(Rfx\_)<sup>(p\_)</sup>]\*(b\_))<sup>(n\_)</sup>/((d\_) + (e\_)\*(x\_)), x\_Symbol] := Simp[(Log[d + e\*x]\*(a + b\*Log[c\*Rfx<sup>p</sup>])<sup>n</sup>/e, x] - Dist[(b\*n\*p)/e, Int[(Log[d + e\*x]\*(a + b\*Log[c\*Rfx<sup>p</sup>])<sup>(n - 1)</sup>\*D[Rfx, x])/Rfx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]

### Rule 2418

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_))<sup>(n\_)</sup>]\*(b\_))<sup>(p\_)</sup>\*(Rfx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)<sup>n</sup>])<sup>p</sup>, Rfx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[Rfx, x] && IntegerQ[p]

### Rule 2394

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_))<sup>(n\_)</sup>]\*(b\_))/((f\_) + (g\_)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)<sup>n</sup>])/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_))]\*(b\_))/((f\_) + (g\_)\*(x\_)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]*(b_.))^(p_.)*((f_) + (g_.)*(x_)^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rubi steps

$$\begin{aligned}
\int (169c + 169dx)^2 (ag + bgx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx &= \int \left( \frac{(-bc + ad)^2 g^2 (169c + 169dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{d^2} \right) dx \\
&= \frac{(b^2 g^2) \int (169c + 169dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx}{28561 d^2} \\
&= \frac{28561 (bc - ad)^2 g^2 (c + dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3d^3} \\
&= \frac{28561 (bc - ad)^2 g^2 (c + dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3d^3} \\
&= \frac{28561 (bc - ad)^2 g^2 (c + dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3d^3} \\
&= \frac{28561 (bc - ad)^2 g^2 (c + dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3d^3} \\
&= \frac{28561 (bc - ad)^2 g^2 (c + dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3d^3} \\
&= -\frac{28561 AB (bc - ad)^4 g^2 nx}{15b^2 d^2} - \frac{28561 B (bc - ad)^3 g^2 n (c + dx)}{30b^3 d^2} \\
&= -\frac{28561 AB (bc - ad)^4 g^2 nx}{15b^2 d^2} - \frac{28561 B^2 (bc - ad)^4 g^2 n (a + bx)}{15b^3 d^2} \\
&= -\frac{28561 AB (bc - ad)^4 g^2 nx}{15b^2 d^2} - \frac{28561 B^2 (bc - ad)^4 g^2 n (a + bx)}{15b^3 d^2} \\
&= -\frac{28561 AB (bc - ad)^4 g^2 nx}{15b^2 d^2} - \frac{28561 B^2 (bc - ad)^4 g^2 n^2 x}{15b^2 d^2} \\
&= -\frac{28561 AB (bc - ad)^4 g^2 nx}{15b^2 d^2} - \frac{28561 B^2 (bc - ad)^4 g^2 n^2 x}{15b^2 d^2} \\
&= -\frac{28561 AB (bc - ad)^4 g^2 nx}{15b^2 d^2} - \frac{28561 B^2 (bc - ad)^4 g^2 n^2 x}{15b^2 d^2}
\end{aligned}$$

**Mathematica [A]** time = 1.02239, size = 1254, normalized size = 1.53

$$g^2 i^2 \left( 12d^5 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 (a+bx)^5 + 30d^4(bc-ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 (a+bx)^4 + 20d^3(bc-ad)^2 \left( A + \right.$$


---

Antiderivative was successfully verified.

[In] Integrate[(a\*g + b\*g\*x)^2\*(c\*i + d\*i\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2,x]

[Out] (g^2\*i^2\*(20\*d^3\*(b\*c - a\*d)^2\*(a + b\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2 + 30\*d^4\*(b\*c - a\*d)\*(a + b\*x)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2 + 12\*d^5\*(a + b\*x)^5\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2 + 20\*B\*(b\*c - a\*d)^3\*n\*(2\*A\*b\*d\*(b\*c - a\*d)\*x + 2\*B\*d\*(b\*c - a\*d)\*(a + b\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n] - d^2\*(a + b\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 2\*B\*(b\*c - a\*d)^2\*n\*Log[c + d\*x] - 2\*(b\*c - a\*d)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[c + d\*x] + B\*(b\*c - a\*d)\*n\*(b\*d\*x + (-b\*c) + a\*d)\*Log[c + d\*x]) + B\*(b\*c - a\*d)^2\*n\*((2\*Log[(d\*(a + b\*x))/(-b\*c) + a\*d]) - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)]) - 10\*B\*(b\*c - a\*d)^2\*n\*(6\*A\*b\*d\*(b\*c - a\*d)^2\*x + 6\*B\*d\*(b\*c - a\*d)^2\*(a + b\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n] + 3\*d^2\*(-b\*c) + a\*d)\*(a + b\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 2\*d^3\*(a + b\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 6\*B\*(b\*c - a\*d)^3\*n\*Log[c + d\*x] - 6\*(b\*c - a\*d)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[c + d\*x] + B\*(b\*c - a\*d)\*n\*(2\*b\*d\*(b\*c - a\*d)\*x - d^2\*(a + b\*x)^2 - 2\*(b\*c - a\*d)^2\*Log[c + d\*x]) + 3\*B\*(b\*c - a\*d)^2\*n\*(b\*d\*x + (-b\*c) + a\*d)\*Log[c + d\*x]) + 3\*B\*(b\*c - a\*d)^3\*n\*((2\*Log[(d\*(a + b\*x))/(-b\*c) + a\*d]) - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)]) + B\*(b\*c - a\*d)\*n\*(24\*A\*b\*d\*(b\*c - a\*d)^3\*x + 24\*B\*d\*(b\*c - a\*d)^3\*(a + b\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n] - 12\*d^2\*(b\*c - a\*d)^2\*(a + b\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 8\*d^3\*(b\*c - a\*d)\*(a + b\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 6\*d^4\*(a + b\*x)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 24\*B\*(b\*c - a\*d)^4\*n\*Log[c + d\*x] - 24\*(b\*c - a\*d)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[c + d\*x] + 4\*B\*(b\*c - a\*d)^2\*n\*(2\*b\*d\*(b\*c - a\*d)\*x - d^2\*(a + b\*x)^2 - 2\*(b\*c - a\*d)^2\*Log[c + d\*x]) + B\*(b\*c - a\*d)\*n\*(6\*b\*d\*(b\*c - a\*d)^2\*x + 3\*d^2\*(-b\*c) + a\*d)\*(a + b\*x)^2 + 2\*d^3\*(a + b\*x)^3 - 6\*(b\*c - a\*d)^3\*Log[c + d\*x]) + 12\*B\*(b\*c - a\*d)^3\*n\*(b\*d\*x + (-b\*c) + a\*d)\*Log[c + d\*x]) + 12\*B\*(b\*c - a\*d)^4\*n\*((2\*Log[(d\*(a + b\*x))/(-b\*c) + a\*d]) - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])))/(60\*b^3\*d^3)

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**Maple [F]** time = 0.691, size = 0, normalized size = 0.

$$\int (bgx + ag)^2 (dix + ci)^2 \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2,x)

[Out] int((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2,x)

**Maxima [B]** time = 3.92027, size = 5733, normalized size = 7.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2,x,  
algorithm="maxima")

[Out] 
$$\begin{aligned} & 2/5*A*B*b^2*d^2*g^2*i^2*x^5*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/5*A^2*b^2*d^2*g^2*i^2*x^5 + A*B*b^2*c*d*g^2*i^2*x^4*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) \\ & + A*B*a*b*d^2*g^2*i^2*x^4*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/2*A^2*b^2*c*d*g^2*i^2*x^4 + 1/2*A^2*a*b*d^2*g^2*i^2*x^4 + 2/3*A*B*b^2*c^2*g^2*i^2*x^3*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) \\ & + 8/3*A*B*a*b*c*d*g^2*i^2*x^3*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 2/3*A*B*a^2*d^2*g^2*i^2*x^3*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/3*A^2*b^2*c^2*g^2*i^2*x^3 + 4/3*A^2*a*b*c*d*g^2*i^2*x^3 \\ & + 1/3*A^2*a^2*d^2*g^2*i^2*x^3 + 2*A*B*a*b*c^2*g^2*i^2*x^2*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 2*A*B*a^2*c*d*g^2*i^2*x^2*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) \\ & + A^2*a^2*c*d*g^2*i^2*x^2 + 1/30*A*B*b^2*d^2*g^2*i^2*n*(12*a^5*\log(b*x + a)/b^5 - 12*c^5*\log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4) \\ & - 1/6*A*B*b^2*c*d*g^2*i^2*n*(6*a^4*\log(b*x + a)/b^4 - 6*c^4*\log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3) \\ & - 1/6*A*B*a*b*d^2*g^2*i^2*n*(6*a^4*\log(b*x + a)/b^4 - 6*c^4*\log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3) \\ & + 1/3*A*B*b^2*c^2*g^2*i^2*n*(2*a^3*\log(b*x + a)/b^3 - 2*c^3*\log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) + 4/3*A*B*a*b*c*d*g^2*i^2*n*(2*a^3*\log(b*x + a)/b^3 - 2*c^3*\log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) \end{aligned}$$



$$\begin{aligned}
& 2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) + 1/3*A*B*a^2*d^2*g^2*i^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 2*A*B*a*b*c^2*g^2*i^2*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) - 2*A*B*a^2*c*d*g^2*i^2*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + 2*A*B*a^2*c^2*g^2*i^2*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + 2*A*B*a^2*c^2*g^2*i^2*x*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*a^2*c^2*g^2*i^2*x - 1/30*(9*a^3*b*c^2*d^3*g^2*i^2*n^2 - 2*a^4*c*d^4*g^2*i^2*n^2 + 2*b^4*c^5*g^2*i^2*n*log(e) + 2*(g^2*i^2*n^2 - 5*g^2*i^2*n*log(e))*a*b^3*c^4*d - (9*g^2*i^2*n^2 - 20*g^2*i^2*n*log(e))*a^2*b^2*c^3*d^2)*B^2*log(d*x + c)/(b^2*d^3) - 1/15*(b^5*c^5*g^2*i^2*n^2 - 5*a*b^4*c^4*d*g^2*i^2*n^2 + 10*a^2*b^3*c^3*d^2*g^2*i^2*n^2 - 10*a^3*b^2*c^2*d^3*g^2*i^2*n^2 + 5*a^4*b*c*d^4*g^2*i^2*n^2 - a^5*d^5*g^2*i^2*n^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^3*d^3) + 1/60*(12*B^2*b^5*d^5*g^2*i^2*x^5*log(e)^2 - 6*((g^2*i^2*n*log(e) - 5*g^2*i^2*log(e))^2)*b^5*c*d^4 - (g^2*i^2*n*log(e) + 5*g^2*i^2*log(e)^2)*a*b^4*d^5)*B^2*x^4 + 2*((g^2*i^2*n^2 - 6*g^2*i^2*n*log(e) + 10*g^2*i^2*log(e)^2)*b^5*c^2*d^3 - 2*(g^2*i^2*n^2 - 20*g^2*i^2*log(e)^2)*a*b^4*c*d^4 + (g^2*i^2*n^2 + 6*g^2*i^2*n*log(e) + 10*g^2*i^2*log(e)^2)*a^2*b^3*d^5)*B^2*x^3 + ((3*g^2*i^2*n^2 - 2*g^2*i^2*n*log(e))*b^5*c^3*d^2 - 3*(g^2*i^2*n^2 + 10*g^2*i^2*n*log(e) - 20*g^2*i^2*log(e)^2)*a*b^4*c^2*d^3 - 3*(g^2*i^2*n^2 - 10*g^2*i^2*n*log(e) - 20*g^2*i^2*log(e)^2)*a^2*b^3*c*d^4 + (3*g^2*i^2*n^2 + 2*g^2*i^2*n*log(e))*a^3*b^2*d^5)*B^2*x^2 - 2*(10*a^3*b^2*c^2*d^3*g^2*i^2*n^2 - 5*a^4*b*c*d^4*g^2*i^2*n^2 + a^5*d^5*g^2*i^2*n^2)*B^2*log(b*x + a)^2 + 4*(b^5*c^5*g^2*i^2*n^2 - 5*a*b^4*c^4*d*g^2*i^2*n^2 + 10*a^2*b^3*c^3*d^2*g^2*i^2*n^2)*B^2*log(b*x + a)*log(d*x + c) - 2*(b^5*c^5*g^2*i^2*n^2 - 5*a*b^4*c^4*d*g^2*i^2*n^2 + 10*a^2*b^3*c^3*d^2*g^2*i^2*n^2)*B^2*log(d*x + c)^2 - 2*(2*(g^2*i^2*n^2 - g^2*i^2*n*log(e))*b^5*c^4*d - (11*g^2*i^2*n^2 - 10*g^2*i^2*n*log(e))*a*b^4*c^3*d^2 + 6*(3*g^2*i^2*n^2 - 5*g^2*i^2*log(e)^2)*a^2*b^3*c^2*d^3 - (11*g^2*i^2*n^2 + 10*g^2*i^2*n*log(e))*a^3*b^2*c*d^4 + 2*(g^2*i^2*n^2 + g^2*i^2*n*log(e))*a^4*b*d^5)*B^2*x + 2*(2*a*b^4*c^4*d*g^2*i^2*n^2 - 9*a^2*b^3*c^3*d^2*g^2*i^2*n^2 + 2*a^5*d^5*g^2*i^2*n*log(e) + (9*g^2*i^2*n^2 + 20*g^2*i^2*n*log(e)))*a^3*b^2*c^2*d^3 - 2*(g^2*i^2*n^2 + 5*g^2*i^2*n*log(e))*a^4*b*c*d^4)*B^2*log(b*x + a) + 2*(6*B^2*b^5*d^5*g^2*i^2*x^5 + 30*B^2*a^2*b^3*c^2*d^3*g^2*i^2*x + 15*(b^5*c*d^4*g^2*i^2 + a*b^4*d^5*g^2*i^2)*B^2*x^4 + 10*(b^5*c^2*d^3*g^2*i^2 + 4*a*b^4*c*d^4*g^2*i^2 + a^2*b^3*d^5*g^2*i^2)*B^2*x^3 + 30*(a*b^4*c^2*d^3*g^2*i^2 + a^2*b^3*c*d^4*g^2*i^2)*B^2*x^2)*log((b*x + a)^n)^2 + 2*(6*B^2*b^5*d^5*g^2*i^2*x^5 + 30*B^2*a^2*b^3*c^2*d^3*g^2*i^2*x + 15*(b^5*c*d^4*g^2*i^2 + a*b^4*d^5*g^2*i^2)*B^2*x^4 + 10*(b^5*c^2*d^3*g^2*i^2 + 4*a*b^4*c*d^4*g^2*i^2 + a^2*b^3*d^5*g^2*i^2)*B^2*x^3 + 30*(a*b^4*c^2*d^3*g^2*i^2 + a^2*b^3*c*d^4*g^2*i^2)*B^2*x^2)*log((d*x + c)^n)^2 + 2*(12*B^2*b^5*d^5*g^2*i^2*x^5*log(e) - 3*((g^2*i^2*n - 10*g^2*i^2*log(e))*b^5*c*d^4 - (g^2*i^2*n + 10*g^2*i^2*log(e))*a*b^4*d^5)*B^2*x^4 + 2*(40*a*b^4*c*d^4*g^2*i^2*log(e) - (3*g^2*i^2*n - 10*g^2*i^2*log(e))*b^5*c^2*d^3 + (3*g^2*i^2*n + 10*g^2*i^2*log(e))*a^2*b^3*d^5)*B^2*x^3 - (b^5*c^3*d^2*g^2*i^2*n - a^3*b^2*d^5*g^2*i^2
\end{aligned}$$

```

*n + 15*(g^2*i^2*n - 4*g^2*i^2*log(e))*a*b^4*c^2*d^3 - 15*(g^2*i^2*n + 4*g^
2*i^2*log(e))*a^2*b^3*c*d^4)*B^2*x^2 + 2*(b^5*c^4*d*g^2*i^2*n - 5*a*b^4*c^3
*d^2*g^2*i^2*n + 5*a^3*b^2*c*d^4*g^2*i^2*n - a^4*b*d^5*g^2*i^2*n + 30*a^2*b
^3*c^2*d^3*g^2*i^2*log(e))*B^2*x + 2*(10*a^3*b^2*c^2*d^3*g^2*i^2*n - 5*a^4*
b*c*d^4*g^2*i^2*n + a^5*d^5*g^2*i^2*n)*B^2*log(b*x + a) - 2*(b^5*c^5*g^2*i^
2*n - 5*a*b^4*c^4*d*g^2*i^2*n + 10*a^2*b^3*c^3*d^2*g^2*i^2*n)*B^2*log(d*x +
c))*log((b*x + a)^n) - 2*(12*B^2*b^5*d^5*g^2*i^2*x^5*log(e) - 3*((g^2*i^2*
n - 10*g^2*i^2*log(e))*b^5*c*d^4 - (g^2*i^2*n + 10*g^2*i^2*log(e))*a*b^4*d^
5)*B^2*x^4 + 2*(40*a*b^4*c*d^4*g^2*i^2*log(e) - (3*g^2*i^2*n - 10*g^2*i^2*1
og(e))*b^5*c^2*d^3 + (3*g^2*i^2*n + 10*g^2*i^2*log(e))*a^2*b^3*d^5)*B^2*x^3
- (b^5*c^3*d^2*g^2*i^2*n - a^3*b^2*d^5*g^2*i^2*n + 15*(g^2*i^2*n - 4*g^2*i
^2*log(e))*a*b^4*c^2*d^3 - 15*(g^2*i^2*n + 4*g^2*i^2*log(e))*a^2*b^3*c*d^4)
)*B^2*x^2 + 2*(b^5*c^4*d*g^2*i^2*n - 5*a*b^4*c^3*d^2*g^2*i^2*n + 5*a^3*b^2*c
*d^4*g^2*i^2*n - a^4*b*d^5*g^2*i^2*n + 30*a^2*b^3*c^2*d^3*g^2*i^2*log(e))*B
^2*x + 2*(10*a^3*b^2*c^2*d^3*g^2*i^2*n - 5*a^4*b*c*d^4*g^2*i^2*n + a^5*d^5*
g^2*i^2*n)*B^2*log(b*x + a) - 2*(b^5*c^5*g^2*i^2*n - 5*a*b^4*c^4*d*g^2*i^2*
n + 10*a^2*b^3*c^3*d^2*g^2*i^2*n)*B^2*log(d*x + c) + 2*(6*B^2*b^5*d^5*g^2*i
^2*x^5 + 30*B^2*a^2*b^3*c^2*d^3*g^2*i^2*x + 15*(b^5*c*d^4*g^2*i^2 + a*b^4*d
^5*g^2*i^2)*B^2*x^4 + 10*(b^5*c^2*d^3*g^2*i^2 + 4*a*b^4*c*d^4*g^2*i^2 + a^2
*b^3*d^5*g^2*i^2)*B^2*x^3 + 30*(a*b^4*c^2*d^3*g^2*i^2 + a^2*b^3*c*d^4*g^2*i
^2)*B^2*x^2)*log((b*x + a)^n)*log((d*x + c)^n)/(b^3*d^3)

```

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**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( A^2 b^2 d^2 g^2 i^2 x^4 + A^2 a^2 c^2 g^2 i^2 + 2 (A^2 b^2 c d + A^2 a b d^2) g^2 i^2 x^3 + (A^2 b^2 c^2 + 4 A^2 a b c d + A^2 a^2 d^2) g^2 i^2 x^2 + 2 (A^2 a b c^2 \right.$$

Verification of antiderivative is not currently implemented for this CAS.

```

[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x,
algorithm="fricas")

```

```

[Out] integral(A^2*b^2*d^2*g^2*i^2*x^4 + A^2*a^2*c^2*g^2*i^2 + 2*(A^2*b^2*c*d + A
^2*a*b*d^2)*g^2*i^2*x^3 + (A^2*b^2*c^2 + 4*A^2*a*b*c*d + A^2*a^2*d^2)*g^2*i
^2*x^2 + 2*(A^2*a*b*c^2 + A^2*a^2*c*d)*g^2*i^2*x + (B^2*b^2*d^2*g^2*i^2*x^4
+ B^2*a^2*c^2*g^2*i^2 + 2*(B^2*b^2*c*d + B^2*a*b*d^2)*g^2*i^2*x^3 + (B^2*b
^2*c^2 + 4*B^2*a*b*c*d + B^2*a^2*d^2)*g^2*i^2*x^2 + 2*(B^2*a*b*c^2 + B^2*a^
2*c*d)*g^2*i^2*x)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*B*b^2*d^2*g^2*i^
2*x^4 + A*B*a^2*c^2*g^2*i^2 + 2*(A*B*b^2*c*d + A*B*a*b*d^2)*g^2*i^2*x^3 + (A
*B*b^2*c^2 + 4*A*B*a*b*c*d + A*B*a^2*d^2)*g^2*i^2*x^2 + 2*(A*B*a*b*c^2 + A
*B*a^2*c*d)*g^2*i^2*x)*log(e*((b*x + a)/(d*x + c))^n), x)

```

---

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*\*2\*(d\*i\*x+c\*i)\*\*2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n))\*\*2, x)

[Out] Timed out

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int (bgx + ag)^2 (dix + ci)^2 \left( B \log \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) + A \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2, x, algorithm="giac")

[Out] integrate((b\*g\*x + a\*g)^2\*(d\*i\*x + c\*i)^2\*(B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)^2, x)

$$3.170 \quad \int (ag+bgx)(ci+dix)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx$$

**Optimal.** Leaf size=635

$$\frac{B^2 g i^2 n^2 (bc - ad)^4 \text{PolyLog} \left( 2, \frac{d(a+bx)}{b(c+dx)} \right)}{6b^3 d^2} - \frac{B g i^2 n (bc - ad)^4 \log \left( \frac{bc-ad}{b(c+dx)} \right) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A + Bn \right)}{6b^3 d^2} - \frac{B g i^2 n (a + bx)(b}{6b^3 d^2}$$

[Out] (B^2\*(b\*c - a\*d)^3\*g\*i^2\*n^2\*x)/(12\*b^2\*d) + (B^2\*(b\*c - a\*d)^2\*g\*i^2\*n^2\*(c + d\*x)^2)/(12\*b\*d^2) - (B\*(b\*c - a\*d)^3\*g\*i^2\*n\*(a + b\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(6\*b^3\*d) - (B\*(b\*c - a\*d)^2\*g\*i^2\*n\*(a + b\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(6\*b^3) + (B\*(b\*c - a\*d)^2\*g\*i^2\*n\*(c + d\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(4\*b\*d^2) - (B\*(b\*c - a\*d)\*g\*i^2\*n\*(c + d\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(6\*d^2) + ((b\*c - a\*d)^2\*g\*i^2\*(a + b\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(12\*b^3) + ((b\*c - a\*d)\*g\*i^2\*(a + b\*x)^2\*(c + d\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(6\*b^2) + (g\*i^2\*(a + b\*x)^2\*(c + d\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(4\*b) - (B\*(b\*c - a\*d)^4\*g\*i^2\*n\*(A + B\*n + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[(b\*c - a\*d)/(b\*(c + d\*x))])/(6\*b^3\*d^2) - (B^2\*(b\*c - a\*d)^4\*g\*i^2\*n^2\*Log[(a + b\*x)/(c + d\*x)])/(12\*b^3\*d^2) - (B^2\*(b\*c - a\*d)^4\*g\*i^2\*n^2\*Log[c + d\*x])/(4\*b^3\*d^2) - (B^2\*(b\*c - a\*d)^4\*g\*i^2\*n^2\*PolyLog[2, (d\*(a + b\*x))/(b\*(c + d\*x))])/(6\*b^3\*d^2)

**Rubi [A]** time = 1.65681, antiderivative size = 614, normalized size of antiderivative = 0.97, number of steps used = 44, number of rules used = 13, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.302$ , Rules used = {2528, 2525, 12, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 43}

$$\frac{B^2 g i^2 n^2 (bc - ad)^4 \text{PolyLog} \left( 2, -\frac{d(a+bx)}{bc-ad} \right)}{6b^3 d^2} + \frac{B g i^2 n (bc - ad)^4 \log(a + bx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{6b^3 d^2} + \frac{A B g i^2 n x (bc - ad)^3}{6b^2 d} +$$

Antiderivative was successfully verified.

[In] Int[(a\*g + b\*g\*x)\*(c\*i + d\*i\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2, x]

[Out] (A\*B\*(b\*c - a\*d)^3\*g\*i^2\*n\*x)/(6\*b^2\*d) + (B^2\*(b\*c - a\*d)^3\*g\*i^2\*n^2\*x)/(12\*b^2\*d) + (B^2\*(b\*c - a\*d)^2\*g\*i^2\*n^2\*(c + d\*x)^2)/(12\*b\*d^2) + (B^2\*(b\*c - a\*d)^4\*g\*i^2\*n^2\*Log[a + b\*x])/(12\*b^3\*d^2) - (B^2\*(b\*c - a\*d)^4\*g\*i^2\*

$$\begin{aligned} & n^2 \text{Log}[a + b*x]^2 / (12*b^3*d^2) + (B^2*(b*c - a*d)^3*g*i^2*n*(a + b*x)*\text{Log} \\ & [e*((a + b*x)/(c + d*x))^n]) / (6*b^3*d) + (B*(b*c - a*d)^2*g*i^2*n*(c + d*x) \\ & ^2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])) / (12*b*d^2) - (B*(b*c - a*d)*g*i^ \\ & 2*n*(c + d*x)^3*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])) / (6*d^2) + (B*(b*c - \\ & a*d)^4*g*i^2*n*\text{Log}[a + b*x]*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])) / (6*b^3 \\ & *d^2) - ((b*c - a*d)*g*i^2*(c + d*x)^3*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n \\ & ])^2) / (3*d^2) + (b*g*i^2*(c + d*x)^4*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]) \\ & ^2) / (4*d^2) - (B^2*(b*c - a*d)^4*g*i^2*n^2*\text{Log}[c + d*x]) / (6*b^3*d^2) + (B^2 \\ & *(b*c - a*d)^4*g*i^2*n^2*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)]) / (6*b^ \\ & 3*d^2) + (B^2*(b*c - a*d)^4*g*i^2*n^2*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d \\ & ))]) / (6*b^3*d^2) \end{aligned}$$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_.))^(p_.)*((c_.) + (d_.)*(x_.))^(q_.))
^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q]^r]^s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

### Rule 31

```
Int[((a_) + (b_.)*(x_.))^( -1), x_Symbol] := Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol]
:> Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e,
Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(Rfx_), x_Symbol]
:> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, Rfx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
Rfx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)
*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x],
x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Log[
c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)),
x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])/g, x] -
Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x]
&& NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))])*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol]
:> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x]
&& NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]/(x_), x_Symbol] :> -Simp[PolyLog[2,
-(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 43

```

Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])

```

Rubi steps

$$\begin{aligned}
\int (170c + 170dx)^2 (ag + bgx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx &= \int \left( \frac{(-bc + ad)g(170c + 170dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{d} \right) dx \\
&= \frac{(bg) \int (170c + 170dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx}{170d} + \frac{(-bc + ad)g \int (170c + 170dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx}{170d} \\
&= -\frac{28900(bc - ad)g(c + dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3d^2} + \frac{7225B^2(bc - ad)^2 g^2 (c + dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3bd^2} \\
&= -\frac{28900(bc - ad)g(c + dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3d^2} + \frac{7225B^2(bc - ad)^2 gn(c + dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3bd^2} \\
&= -\frac{28900(bc - ad)g(c + dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3d^2} + \frac{7225B^2(bc - ad)^2 gn(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3b^3d} \\
&= \frac{14450AB(bc - ad)^3 gn x}{3b^2d} + \frac{7225B^2(bc - ad)^2 gn(c + dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3bd^2} \\
&= \frac{14450AB(bc - ad)^3 gn x}{3b^2d} + \frac{14450B^2(bc - ad)^3 gn(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3b^3d} \\
&= \frac{14450AB(bc - ad)^3 gn x}{3b^2d} + \frac{14450B^2(bc - ad)^3 gn(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3b^3d} \\
&= \frac{14450AB(bc - ad)^3 gn x}{3b^2d} + \frac{7225B^2(bc - ad)^3 gn^2 x}{3b^2d} + \frac{7225B^2(bc - ad)^2 gn^2 (c + dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3b^2d} \\
&= \frac{14450AB(bc - ad)^3 gn x}{3b^2d} + \frac{7225B^2(bc - ad)^3 gn^2 x}{3b^2d} + \frac{7225B^2(bc - ad)^2 gn^2 (c + dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3b^2d} \\
&= \frac{14450AB(bc - ad)^3 gn x}{3b^2d} + \frac{7225B^2(bc - ad)^3 gn^2 x}{3b^2d} + \frac{7225B^2(bc - ad)^2 gn^2 (c + dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3b^2d}
\end{aligned}$$



**Mathematica [A]** time = 0.629466, size = 713, normalized size = 1.12

$$gi^2 \left( \frac{4Bn(bc-ad)^2 \left( -Bn(bc-ad)^2 \left( \log(a+bx) \left( \log(a+bx) - 2 \log\left(\frac{b(c+dx)}{bc-ad}\right) \right) - 2 \text{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) \right) + b^2(c+dx)^2 \left( B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A \right) + 2(bc-ad)^2 \log(a+bx) \left( B \log\right)}{b^3} \right)$$

Antiderivative was successfully verified.

[In] Integrate[(a\*g + b\*g\*x)\*(c\*i + d\*i\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2,x]

[Out] (g\*i^2\*(-4\*(b\*c - a\*d)\*(c + d\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2 + 3\*b\*(c + d\*x)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2 + (4\*B\*(b\*c - a\*d)^2\*n\*(2\*A\*b\*d\*(b\*c - a\*d)\*x - B\*(b\*c - a\*d)\*n\*(b\*d\*x + (b\*c - a\*d)\*Log[a + b\*x]) + 2\*B\*d\*(b\*c - a\*d)\*(a + b\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n] + b^2\*(c + d\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 2\*(b\*c - a\*d)^2\*Log[a + b\*x]\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 2\*B\*(b\*c - a\*d)^2\*n\*Log[c + d\*x] - B\*(b\*c - a\*d)^2\*n\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]) - 2\*PolyLog[2, (d\*(a + b\*x))/(-b\*c + a\*d)])))/b^3 - (B\*(b\*c - a\*d)\*n\*(6\*A\*b\*d\*(b\*c - a\*d)^2\*x - 3\*B\*(b\*c - a\*d)^2\*n\*(b\*d\*x + (b\*c - a\*d)\*Log[a + b\*x]) - B\*(b\*c - a\*d)\*n\*(2\*b\*d\*(b\*c - a\*d)\*x + b^2\*(c + d\*x)^2 + 2\*(b\*c - a\*d)^2\*Log[a + b\*x]) + 6\*B\*d\*(b\*c - a\*d)^2\*(a + b\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n] + 3\*b^2\*(b\*c - a\*d)\*(c + d\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 2\*b^3\*(c + d\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 6\*(b\*c - a\*d)^3\*Log[a + b\*x]\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 6\*B\*(b\*c - a\*d)^3\*n\*Log[c + d\*x] - 3\*B\*(b\*c - a\*d)^3\*n\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]) - 2\*PolyLog[2, (d\*(a + b\*x))/(-b\*c + a\*d)])))/b^3)/(12\*d^2)

**Maple [F]** time = 0.48, size = 0, normalized size = 0.

$$\int (bgx + ag)(dix + ci)^2 \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2,x)

[Out] int((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2,x)

**Maxima [B]** time = 3.88865, size = 3594, normalized size = 5.66

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, a
lgorithm="maxima")
```

```
[Out] 1/2*A*B*b*d^2*g*i^2*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/4*A^2*b*
d^2*g*i^2*x^4 + 4/3*A*B*b*c*d*g*i^2*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))
^n) + 2/3*A*B*a*d^2*g*i^2*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 2/3*
A^2*b*c*d*g*i^2*x^3 + 1/3*A^2*a*d^2*g*i^2*x^3 + A*B*b*c^2*g*i^2*x^2*log(e*(
b*x/(d*x + c) + a/(d*x + c))^n) + 2*A*B*a*c*d*g*i^2*x^2*log(e*(b*x/(d*x + c
) + a/(d*x + c))^n) + 1/2*A^2*b*c^2*g*i^2*x^2 + A^2*a*c*d*g*i^2*x^2 - 1/12*
A*B*b*d^2*g*i^2*x*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^
3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3
*d^3)*x)/(b^3*d^3)) + 2/3*A*B*b*c*d*g*i^2*x*(2*a^3*log(b*x + a)/b^3 - 2*c^3
*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^
2*d^2)) + 1/3*A*B*a*d^2*g*i^2*x*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c
)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - A*
B*b*c^2*g*i^2*x*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*
x/(b*d)) - 2*A*B*a*c*d*g*i^2*x*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2
+ (b*c - a*d)*x/(b*d)) + 2*A*B*a*c^2*g*i^2*x*(a*log(b*x + a)/b - c*log(d*x
+ c)/d) + 2*A*B*a*c^2*g*i^2*x*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2
*a*c^2*g*i^2*x - 1/12*(7*a^2*b*c^2*d^2*g*i^2*x^n^2 - 2*a^3*c*d^3*g*i^2*x^n^2 +
(g*i^2*x^n^2 - 2*g*i^2*x^n*log(e))*b^3*c^4 - 2*(3*g*i^2*x^n^2 - 4*g*i^2*x^n*log(e))
*a*b^2*c^3*d)*B^2*log(d*x + c)/(b^2*d^2) + 1/6*(b^4*c^4*g*i^2*x^n^2 - 4*a*b^3
*c^3*d*g*i^2*x^n^2 + 6*a^2*b^2*c^2*d^2*g*i^2*x^n^2 - 4*a^3*b*c*d^3*g*i^2*x^n^2 +
a^4*d^4*g*i^2*x^n^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog
(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^3*d^2) + 1/12*(3*B^2*b^4*d^4*g*i^2*x^4
*log(e)^2 - 2*((g*i^2*x^n*log(e) - 4*g*i^2*x^n*log(e)^2)*b^4*c*d^3 - (g*i^2*x^n*log
(e) + 2*g*i^2*x^n*log(e)^2)*a*b^3*d^4)*B^2*x^3 + ((g*i^2*x^n^2 - 5*g*i^2*x^n*log(e)
+ 6*g*i^2*x^n*log(e)^2)*b^4*c^2*d^2 - 2*(g*i^2*x^n^2 - 2*g*i^2*x^n*log(e) - 6*g*i^
2*x^n*log(e)^2)*a*b^3*c*d^3 + (g*i^2*x^n^2 + g*i^2*x^n*log(e))*a^2*b^2*d^4)*B^2*x^2
- (6*a^2*b^2*c^2*d^2*g*i^2*x^n^2 - 4*a^3*b*c*d^3*g*i^2*x^n^2 + a^4*d^4*g*i^2*x^n
^2)*B^2*log(b*x + a)^2 - 2*(b^4*c^4*g*i^2*x^n^2 - 4*a*b^3*c^3*d*g*i^2*x^n^2)*B^
2*log(b*x + a)*log(d*x + c) + (b^4*c^4*g*i^2*x^n^2 - 4*a*b^3*c^3*d*g*i^2*x^n^2)
*B^2*log(d*x + c)^2 + ((3*g*i^2*x^n^2 - 2*g*i^2*x^n*log(e))*b^4*c^3*d - (7*g*i^
2*x^n^2 + 4*g*i^2*x^n*log(e) - 12*g*i^2*x^n*log(e)^2)*a*b^3*c^2*d^2 + (5*g*i^2*x^n^2
+ 8*g*i^2*x^n*log(e))*a^2*b^2*c*d^3 - (g*i^2*x^n^2 + 2*g*i^2*x^n*log(e))*a^3*b*d^
4)*B^2*x - (2*a*b^3*c^3*d*g*i^2*x^n^2 - (g*i^2*x^n^2 + 12*g*i^2*x^n*log(e))*a^2*b
^2*c^2*d^2 - 2*(g*i^2*x^n^2 - 4*g*i^2*x^n*log(e))*a^3*b*c*d^3 + (g*i^2*x^n^2 - 2*
```

$$\begin{aligned}
& g^{i^2 n} \log(e) a^4 d^4 B^2 \log(bx + a) + (3B^2 b^4 d^4 g^{i^2 x^4} + 12B^2 a b^3 c^2 d^2 g^{i^2 x} + 4(2b^4 c d^3 g^{i^2} + a b^3 d^4 g^{i^2}) B^2 x^3 \\
& + 6(b^4 c^2 d^2 g^{i^2} + 2a b^3 c d^3 g^{i^2}) B^2 x^2) \log((bx + a)^n)^2 + (3B^2 b^4 d^4 g^{i^2 x^4} + 12B^2 a b^3 c^2 d^2 g^{i^2 x} + 4(2b^4 c d^3 g^{i^2} + a b^3 d^4 g^{i^2}) B^2 x^3 \\
& + 6(b^4 c^2 d^2 g^{i^2} + 2a b^3 c d^3 g^{i^2}) B^2 x^2) \log((dx + c)^n)^2 + (6B^2 b^4 d^4 g^{i^2 x^4} \log(e) - 2((g^{i^2 n} - 8g^{i^2} \log(e)) b^4 c d^3 - (g^{i^2 n} + 4g^{i^2} \log(e)) a b^3 d^4) B^2 \\
& x^3 + (a^2 b^2 d^4 g^{i^2 n} - (5g^{i^2 n} - 12g^{i^2} \log(e)) b^4 c^2 d^2 + 4(g^{i^2 n} + 6g^{i^2} \log(e)) a b^3 c d^3) B^2 x^2 - 2(b^4 c^3 d g^{i^2 n} - 4a^2 b^2 c d^3 g^{i^2 n} + a^3 b d^4 g^{i^2 n} + 2(g^{i^2 n} - 6g^{i^2} \log(e)) a \\
& b^3 c^2 d^2) B^2 x + 2(6a^2 b^2 c^2 d^2 g^{i^2 n} - 4a^3 b c d^3 g^{i^2 n} + a^4 d^4 g^{i^2 n}) B^2 \log(bx + a) + 2(b^4 c^4 g^{i^2 n} - 4a b^3 c^3 d g^{i^2 n}) B^2 \log(dx + c)) \log((bx + a)^n) - (6B^2 b^4 d^4 g^{i^2 x^4} \log(e) \\
& - 2((g^{i^2 n} - 8g^{i^2} \log(e)) b^4 c d^3 - (g^{i^2 n} + 4g^{i^2} \log(e)) a b^3 d^4) B^2 x^3 + (a^2 b^2 d^4 g^{i^2 n} - (5g^{i^2 n} - 12g^{i^2} \log(e)) b^4 c^2 d^2 + 4(g^{i^2 n} + 6g^{i^2} \log(e)) a b^3 c d^3) B^2 x^2 - 2(b^4 c^3 d g^{i^2 n} - 4a^2 b^2 c d^3 g^{i^2 n} + a^3 b d^4 g^{i^2 n} + 2(g^{i^2 n} - 6g^{i^2} \log(e)) a \\
& b^3 c^2 d^2) B^2 x + 2(6a^2 b^2 c^2 d^2 g^{i^2 n} - 4a^3 b c d^3 g^{i^2 n} + a^4 d^4 g^{i^2 n}) B^2 \log(bx + a) + 2(b^4 c^4 g^{i^2 n} - 4a b^3 c^3 d g^{i^2 n}) B^2 \log(dx + c) + 2(3B^2 b^4 d^4 g^{i^2 x^4} + 12B^2 a b^3 c^2 d^2 g^{i^2 x} + 4(2b^4 c d^3 g^{i^2} + a b^3 d^4 g^{i^2}) B^2 x^3 + 6(b^4 c^2 d^2 g^{i^2} + 2a b^3 c d^3 g^{i^2}) B^2 x^2) \log((bx + a)^n) \log((dx + c)^n) / (b^3 d^2)
\end{aligned}$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( A^2 b d^2 g^i x^3 + A^2 a c^2 g^i + (2 A^2 b c d + A^2 a d^2) g^i x^2 + (A^2 b c^2 + 2 A^2 a c d) g^i x + (B^2 b d^2 g^i x^3 + B^2 a c^2 g^i + (2 B^2 a b c d + B^2 a^2 d^2) g^i x^2 + (A^2 b^2 c^2 + 2 A^2 a b c d) g^i x + (B^2 b^2 d^2 g^i x^3 + B^2 a^2 c^2 g^i + (2 B^2 a b c d + B^2 a^2 d^2) g^i x^2 + (B^2 b^2 c^2 + 2 B^2 a b c d) g^i x) \log(e((bx + a)/(dx + c))^n)^2 + 2(A B b^2 d^2 g^i x^3 + A B a^2 c^2 g^i + (2 A B b c d + A B a^2 d^2) g^i x^2 + (A B b^2 c^2 + 2 A B a b c d) g^i x) \log(e((bx + a)/(dx + c))^n), x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2,x, algorithm="fricas")

[Out] integral(A^2\*b\*d^2\*g^i\*x^3 + A^2\*a\*c^2\*g^i + (2\*A^2\*b\*c\*d + A^2\*a\*d^2)\*g^i\*x^2 + (A^2\*b\*c^2 + 2\*A^2\*a\*c\*d)\*g^i\*x + (B^2\*b\*d^2\*g^i\*x^3 + B^2\*a\*c^2\*g^i + (2\*B^2\*b\*c\*d + B^2\*a\*d^2)\*g^i\*x^2 + (B^2\*b\*c^2 + 2\*B^2\*a\*b\*c\*d)\*g^i\*x)\*log(e\*((b\*x + a)/(d\*x + c))^n)^2 + 2\*(A\*B\*b^2\*d^2\*g^i\*x^3 + A\*B\*a\*c^2\*g^i + (2\*A\*B\*b\*c\*d + A\*B\*a\*d^2)\*g^i\*x^2 + (A\*B\*b\*c^2 + 2\*A\*B\*a\*b\*c\*d)\*g^i\*x)\*log(e\*((b\*x + a)/(d\*x + c))^n), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)\*\*2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n))\*\*2,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int (bgx + ag)(dix + ci)^2 \left( B \log \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) + A \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2,x, algorithm="giac")

[Out] integrate((b\*g\*x + a\*g)\*(d\*i\*x + c\*i)^2\*(B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)^2, x)

$$3.171 \quad \int (ci + dix)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx$$

**Optimal.** Leaf size=361

$$\frac{2B^2i^2n^2(bc - ad)^3 \text{PolyLog} \left( 2, \frac{b(c+dx)}{d(a+bx)} \right)}{3b^3d} + \frac{2Bi^2n(bc - ad)^3 \log \left( 1 - \frac{b(c+dx)}{d(a+bx)} \right) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{3b^3d} - \frac{2Bi^2n(a + bx)(b}{3b^2d}$$

[Out] (B^2\*(b\*c - a\*d)^2\*i^2\*n^2\*x)/(3\*b^2) - (2\*B\*(b\*c - a\*d)^2\*i^2\*n\*(a + b\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(3\*b^3) - (B\*(b\*c - a\*d)\*i^2\*n\*(c + d\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(3\*b\*d) + (i^2\*(c + d\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(3\*d) + (B^2\*(b\*c - a\*d)^3\*i^2\*n^2\*Log[(a + b\*x)/(c + d\*x)])/(3\*b^3\*d) + (B^2\*(b\*c - a\*d)^3\*i^2\*n^2\*Log[c + d\*x])/(b^3\*d) + (2\*B\*(b\*c - a\*d)^3\*i^2\*n\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[1 - (b\*(c + d\*x))/(d\*(a + b\*x))])/(3\*b^3\*d) - (2\*B^2\*(b\*c - a\*d)^3\*i^2\*n^2\*PolyLog[2, (b\*(c + d\*x))/(d\*(a + b\*x))])/(3\*b^3\*d)

**Rubi [A]** time = 0.543237, antiderivative size = 454, normalized size of antiderivative = 1.26, number of steps used = 19, number of rules used = 13, integrand size = 35,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.371$ , Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 43}

$$\frac{2B^2i^2n^2(bc - ad)^3 \text{PolyLog} \left( 2, -\frac{d(a+bx)}{bc-ad} \right)}{3b^3d} - \frac{2Bi^2n(bc - ad)^3 \log(a + bx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{3b^3d} - \frac{2ABi^2nx(bc - ad)^2}{3b^2}$$

Antiderivative was successfully verified.

[In] Int[(c\*i + d\*i\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2,x]

[Out] (-2\*A\*B\*(b\*c - a\*d)^2\*i^2\*n\*x)/(3\*b^2) + (B^2\*(b\*c - a\*d)^2\*i^2\*n^2\*x)/(3\*b^2) + (B^2\*(b\*c - a\*d)^3\*i^2\*n^2\*Log[a + b\*x])/(3\*b^3\*d) + (B^2\*(b\*c - a\*d)^3\*i^2\*n^2\*Log[a + b\*x]^2)/(3\*b^3\*d) - (2\*B^2\*(b\*c - a\*d)^2\*i^2\*n\*(a + b\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n])/(3\*b^3) - (B\*(b\*c - a\*d)\*i^2\*n\*(c + d\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(3\*b\*d) - (2\*B\*(b\*c - a\*d)^3\*i^2\*n\*Log[a + b\*x]\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(3\*b^3\*d) + (i^2\*(c + d\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(3\*d) + (2\*B^2\*(b\*c - a\*d)^3\*i^2\*n^2\*Log[c + d\*x])/(3\*b^3\*d) - (2\*B^2\*(b\*c - a\*d)^3\*i^2\*n^2\*Log[a + b\*x]\*Log[(b\*(c + d\*x))/(b\*c - a\*d)])/(3\*b^3\*d) - (2\*B^2\*(b\*c - a\*d)^3\*i^2\*n^2\*PolyLog[2, -(d\*(a + b\*x))/(b\*c - a\*d)])/(3\*b^3\*d)

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*RFX^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFX, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.)]^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(n_), x_Symbol] := Simp[Log[RemoveContent[a + b*x, x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFX^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFX_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFX, x]},
```

Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[  
RFx, x] && IntegerQ[p]

### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.  
)\*(x\_))^(q\_.), x\_Symbol] := Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^  
n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E  
qQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] := Simp[(a + b\*Lo  
g[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_  
)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x  
)^n])/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x  
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_  
Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x  
, x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*  
(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] := -Simp[PolyLog[2  
, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rule 43

Int[((a\_.) + (b\_.)\*(x\_))^(m\_.)\*((c\_.) + (d\_.)\*(x\_))^(n\_.), x\_Symbol] := Int  
[ExpandIntegrand[(a + b\*x)^m\*(c + d\*x)^n, x], x] /; FreeQ[{a, b, c, d, n},  
x] && NeQ[b\*c - a\*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && Le  
Q[7\*m + 4\*n + 4, 0]) || LtQ[9\*m + 5\*(n + 1), 0] || GtQ[m + n + 2, 0])

### Rubi steps

$$\begin{aligned}
\int (171c + 171dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx &= \frac{9747(c+dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{d} - \frac{(2Bn) \int \frac{5000211(bc-ad)(c+dx)^{a+}}{513d}}{513d} \\
&= \frac{9747(c+dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{d} - \frac{(19494B(bc-ad)n) \int \frac{(c+dx)^{a+}}{d}}{d} \\
&= \frac{9747(c+dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{d} - \frac{(19494B(bc-ad)n) \int \frac{d(b)}{d(b)}}{d(b)} \\
&= \frac{9747(c+dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{d} - \frac{(19494B(bc-ad)n) \int (c+)}{d} \\
&= -\frac{19494AB(bc-ad)^2nx}{b^2} - \frac{9747B(bc-ad)n(c+dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{bd} \\
&= -\frac{19494AB(bc-ad)^2nx}{b^2} - \frac{19494B^2(bc-ad)^2n(a+bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^3} \\
&= -\frac{19494AB(bc-ad)^2nx}{b^2} - \frac{19494B^2(bc-ad)^2n(a+bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^3} \\
&= -\frac{19494AB(bc-ad)^2nx}{b^2} + \frac{9747B^2(bc-ad)^2n^2x}{b^2} + \frac{9747B^2(bc-ad)^2n^2x}{b^3c} \\
&= -\frac{19494AB(bc-ad)^2nx}{b^2} + \frac{9747B^2(bc-ad)^2n^2x}{b^2} + \frac{9747B^2(bc-ad)^2n^2x}{b^3c} \\
&= -\frac{19494AB(bc-ad)^2nx}{b^2} + \frac{9747B^2(bc-ad)^2n^2x}{b^2} + \frac{9747B^2(bc-ad)^2n^2x}{b^3c}
\end{aligned}$$

**Mathematica [A]** time = 0.238118, size = 303, normalized size = 0.84

$$i^2 \left( (c+dx)^3 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right) \right)^2 - \frac{Bn(bc-ad) \left( -Bn(bc-ad)^2 \left( \log(a+bx) \left( \log(a+bx) - 2 \log \left( \frac{b(c+dx)}{bc-ad} \right) \right) - 2 \text{PolyLog} \left( 2, \frac{d(a+bx)}{ad-bc} \right) \right) + b^2(c+dx)^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right) \right)}{b^3c}$$



Antiderivative was successfully verified.

[In] Integrate[(c\*i + d\*i\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2,x]

[Out] (i^2\*((c + d\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2 - (B\*(b\*c - a\*d)\*n\*(2\*A\*b\*d\*(b\*c - a\*d)\*x - B\*(b\*c - a\*d)\*n\*(b\*d\*x + (b\*c - a\*d)\*Log[a + b\*x]) + 2\*B\*d\*(b\*c - a\*d)\*(a + b\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n] + b^2\*(c + d\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 2\*(b\*c - a\*d)^2\*Log[a + b\*x])\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 2\*B\*(b\*c - a\*d)^2\*n\*Log[c + d\*x] - B\*(b\*c - a\*d)^2\*n\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]) - 2\*PolyLog[2, (d\*(a + b\*x))/(-(b\*c) + a\*d)]))/b^3)/(3\*d)

**Maple [F]** time = 0.527, size = 0, normalized size = 0.

$$\int (dix + ci)^2 \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*i\*x+c\*i)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2,x)

[Out] int((d\*i\*x+c\*i)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2,x)

**Maxima [B]** time = 3.69403, size = 1989, normalized size = 5.51

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2,x, algorithm="maxima")

[Out] 2/3\*A\*B\*d^2\*i^2\*x^3\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n) + 1/3\*A^2\*d^2\*i^2\*x^3 + 2\*A\*B\*c\*d\*i^2\*x^2\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n) + A^2\*c\*d\*i^2\*x^2 + 1/3\*A\*B\*d^2\*i^2\*n\*(2\*a^3\*log(b\*x + a)/b^3 - 2\*c^3\*log(d\*x + c)/d^3 - ((b^2\*c\*d - a\*b\*d^2)\*x^2 - 2\*(b^2\*c^2 - a^2\*d^2)\*x)/(b^2\*d^2)) - 2\*A\*B\*c\*d\*i^2\*n\*(a^2\*log(b\*x + a)/b^2 - c^2\*log(d\*x + c)/d^2 + (b\*c - a\*d)\*x/(b\*d)) + 2\*A\*B\*c^2\*i^2\*n\*(a\*log(b\*x + a)/b - c\*log(d\*x + c)/d) + 2\*A\*B\*c^2\*i^2\*x\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n) + A^2\*c^2\*i^2\*x - 1/3\*(5\*a\*b\*c^2\*d

$$\begin{aligned}
& i^{2n} - 2a^2cd^2i^{2n} - (3i^{2n} - 2i^{2n}\log(e))b^2c^3B^2\log(dx+c)/(b^2d) - 2/3(b^3c^3i^{2n} - 3ab^2c^2di^{2n} + 3a^2b^2cd^2i^{2n} - a^3d^3i^{2n})\log(bx+a)\log((b^2dx+ad)/(bc-ad)+1) \\
& + \operatorname{dilog}(-(b^2dx+ad)/(bc-ad))B^2/(b^3d) + 1/3(B^2b^3d^3i^{2n}x^3\log(e)^2 + 2B^2b^3c^3i^{2n}x^2\log(bx+a)\log(dx+c) - B^2b^3c^3i^{2n}x\log(dx+c)^2 \\
& + (ab^2d^3i^{2n}\log(e) - (i^{2n}\log(e) - 3i^{2n}\log(e)^2)b^3cd^2)B^2x^2 - (3ab^2c^2di^{2n} - 3a^2b^2cd^2i^{2n} + a^3d^3i^{2n})B^2\log(bx+a)^2 \\
& + ((i^{2n} - 4i^{2n}\log(e) + 3i^{2n}\log(e)^2)b^3c^2d - 2(i^{2n} - 3i^{2n}\log(e))ab^2cd^2 + (i^{2n} - 2i^{2n}\log(e))a^2bd^3)B^2x \\
& - (2(2i^{2n} - 3i^{2n}\log(e))ab^2c^2d - (7i^{2n} - 6i^{2n}\log(e))a^2b^2cd^2 + (3i^{2n} - 2i^{2n}\log(e))a^3d^3)B^2\log(bx+a) \\
& + (B^2b^3d^3i^{2n}x^3 + 3B^2b^3cd^2i^{2n}x^2 + 3B^2b^3c^2di^{2n}x)\log((bx+a)^n)^2 + (B^2b^3d^3i^{2n}x^3 + 3B^2b^3cd^2i^{2n}x^2 + 3B^2b^3c^2di^{2n}x)\log((dx+c)^n)^2 \\
& + (2B^2b^3d^3i^{2n}x^3\log(e) - 2B^2b^3c^3i^{2n}x^2\log(dx+c) + (ab^2d^3i^{2n} - (i^{2n} - 6i^{2n}\log(e))b^3cd^2)B^2x^2 + 2(3ab^2cd^2i^{2n} - a^2bd^3i^{2n} - (2i^{2n} - 3i^{2n}\log(e))b^3c^2d)B^2x \\
& + 2(3ab^2c^2di^{2n} - 3a^2b^2cd^2i^{2n} + a^3d^3i^{2n})B^2\log(bx+a))\log((bx+a)^n) - (2B^2b^3d^3i^{2n}x^3\log(e) - 2B^2b^3c^3i^{2n}x^2\log(dx+c) \\
& + (ab^2d^3i^{2n} - (i^{2n} - 6i^{2n}\log(e))b^3cd^2)B^2x^2 + 2(3ab^2cd^2i^{2n} - a^2bd^3i^{2n} - (2i^{2n} - 3i^{2n}\log(e))b^3c^2d)B^2x \\
& + 2(3ab^2c^2di^{2n} - 3a^2b^2cd^2i^{2n} + a^3d^3i^{2n})B^2\log(bx+a) + 2(B^2b^3d^3i^{2n}x^3 + 3B^2b^3cd^2i^{2n}x^2 + 3B^2b^3c^2di^{2n}x)\log((bx+a)^n)\log((dx+c)^n))/(b^3d)
\end{aligned}$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(A^2d^2i^2x^2 + 2A^2cdi^2x + A^2c^2i^2 + (B^2d^2i^2x^2 + 2B^2cdi^2x + B^2c^2i^2)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2(ABd^2i^2x^2 + 2ABcdi^2x + A^2B^2c^2i^2)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\log((dx+c)^n)\right), x)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2,x, algorithm="fricas")

[Out] integral(A^2\*d^2\*i^2\*x^2 + 2\*A^2\*c\*d\*i^2\*x + A^2\*c^2\*i^2 + (B^2\*d^2\*i^2\*x^2 + 2\*B^2\*c\*d\*i^2\*x + B^2\*c^2\*i^2)\*log(e\*((b\*x + a)/(d\*x + c))^n)^2 + 2\*(A\*B\*d^2\*i^2\*x^2 + 2\*A\*B\*c\*d\*i^2\*x + A\*B\*c^2\*i^2)\*log(e\*((b\*x + a)/(d\*x + c))^n), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*\*2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n))\*\*2,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int (dix + ci)^2 \left( B \log \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) + A \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2,x, algorithm="giac")

[Out] integrate((d\*i\*x + c\*i)^2\*(B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)^2, x)

$$3.172 \quad \int \frac{(ci+dx)^2 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{ag+bgx} dx$$

**Optimal.** Leaf size=572

$$\frac{2Bi^2n(bc-ad)^2 \text{PolyLog} \left( 2, \frac{b(c+dx)}{d(a+bx)} \right) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{b^3g} + \frac{2B^2i^2n^2(bc-ad)^2 \text{PolyLog} \left( 2, \frac{d(a+bx)}{b(c+dx)} \right)}{b^3g} - \frac{B^2i^2n^2(bc-ad)}{b^3g}$$

```
[Out] -((B*d*(b*c - a*d)*i^2*n*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^3*g) + (d*(b*c - a*d)*i^2*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(b^3*g) + (i^2*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*b*g) + (2*B*(b*c - a*d)^2*i^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(b^3*g) + (B^2*(b*c - a*d)^2*i^2*n^2*Log[c + d*x])/(b^3*g) + (B*(b*c - a*d)^2*i^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^3*g) - ((b*c - a*d)^2*i^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^3*g) + (2*B^2*(b*c - a*d)^2*i^2*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b^3*g) - (B^2*(b*c - a*d)^2*i^2*n^2*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^3*g) + (2*B*(b*c - a*d)^2*i^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^3*g) + (2*B^2*(b*c - a*d)^2*i^2*n^2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])/(b^3*g)
```

**Rubi [B]** time = 5.08149, antiderivative size = 1790, normalized size of antiderivative = 3.13, number of steps used = 82, number of rules used = 27, integrand size = 45,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.6$ , Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2500, 2440, 2434, 2433, 2375, 2317, 2374, 6589, 2499, 2302, 30, 2396, 2525, 2486, 31}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x), x]
```

```
[Out] -((A*B*d*(b*c - a*d)*i^2*n*x)/(b^2*g) - (a*B^2*d*(b*c - a*d)*i^2*n^2*Log[a + b*x]^2)/(b^3*g) + (B^2*(b*c - a*d)^2*i^2*n^2*Log[a + b*x]^2)/(2*b^3*g) - (A*B*(b*c - a*d)^2*i^2*n*Log[g*(a + b*x)]^2)/(b^3*g) + (B^2*(b*c - a*d)^2*i^2*n^2*Log[g*(a + b*x)]^3)/(3*b^3*g) - (B^2*(b*c - a*d)^2*i^2*n^2*Log[g*(a + b*x)]^2*Log[-c - d*x])/(b^3*g) + (2*B^2*(b*c - a*d)^2*i^2*n*Log[g*(a + b
```

$$\begin{aligned}
& *x)] * \text{Log}[(a + b*x)^n] * \text{Log}[-c - d*x]) / (b^3*g) - (B^2*(b*c - a*d)^2*i^2*\text{Log}[(a + b*x)^n]^2 * \text{Log}[-c - d*x]) / (b^3*g) - (B^2*d*(b*c - a*d)*i^2*n*(a + b*x) * \text{Log}[e*((a + b*x)/(c + d*x))^n]) / (b^3*g) + (2*a*B*d*(b*c - a*d)*i^2*n * \text{Log}[a + b*x] * (A + B * \text{Log}[e*((a + b*x)/(c + d*x))^n])) / (b^3*g) - (B*(b*c - a*d)^2*i^2 * \text{Log}[a + b*x] * (A + B * \text{Log}[e*((a + b*x)/(c + d*x))^n])) / (b^3*g) + (d*(b*c - a*d)*i^2*x*(A + B * \text{Log}[e*((a + b*x)/(c + d*x))^n])^2) / (b^2*g) + (i^2*(c + d*x)^2*(A + B * \text{Log}[e*((a + b*x)/(c + d*x))^n])^2) / (2*b*g) + (B^2*(b*c - a*d)^2*i^2*n^2 * \text{Log}[c + d*x]) / (b^3*g) + (2*B^2*c*(b*c - a*d)*i^2*n^2 * \text{Log}[-((d*(a + b*x))/(b*c - a*d))] * \text{Log}[c + d*x]) / (b^2*g) - (2*B*c*(b*c - a*d)*i^2*n*(A + B * \text{Log}[e*((a + b*x)/(c + d*x))^n]) * \text{Log}[c + d*x]) / (b^2*g) - (B^2*c*(b*c - a*d)*i^2*n^2 * \text{Log}[c + d*x]^2) / (b^2*g) + (2*a*B^2*d*(b*c - a*d)*i^2*n^2 * \text{Log}[a + b*x] * \text{Log}[(b*(c + d*x))/(b*c - a*d)]) / (b^3*g) - (B^2*(b*c - a*d)^2*i^2*n^2 * \text{Log}[a + b*x] * \text{Log}[(b*(c + d*x))/(b*c - a*d)]) / (b^3*g) + (B^2*(b*c - a*d)^2*i^2*n^2 * \text{Log}[g*(a + b*x)]^2 * \text{Log}[(b*(c + d*x))/(b*c - a*d)]) / (b^3*g) + (B^2*(b*c - a*d)^2*i^2 * \text{Log}[(a + b*x)^n]^2 * \text{Log}[(b*(c + d*x))/(b*c - a*d)]) / (b^3*g) + (B^2*(b*c - a*d)^2*i^2 * \text{Log}[-((d*(a + b*x))/(b*c - a*d))] * \text{Log}[(c + d*x)^(-n)]^2) / (b^3*g) - (B^2*(b*c - a*d)^2*i^2 * \text{Log}[g*(a + b*x)] * \text{Log}[(c + d*x)^(-n)]^2) / (b^3*g) + ((b*c - a*d)^2*i^2*(A + B * \text{Log}[e*((a + b*x)/(c + d*x))^n])^2 * \text{Log}[a*g + b*g*x]) / (b^3*g) + (2*A*B*(b*c - a*d)^2*i^2*n * \text{Log}[(b*(c + d*x))/(b*c - a*d)] * \text{Log}[a*g + b*g*x]) / (b^3*g) - (2*B^2*(b*c - a*d)^2*i^2*n * \text{Log}[(b*(c + d*x))/(b*c - a*d)] * (\text{Log}[(a + b*x)^n] - \text{Log}[e*((a + b*x)/(c + d*x))^n] + \text{Log}[(c + d*x)^(-n)])) * \text{Log}[a*g + b*g*x]) / (b^3*g) - (B^2*(b*c - a*d)^2*i^2*n * \text{Log}[e*((a + b*x)/(c + d*x))^n] * \text{Log}[a*g + b*g*x]^2) / (b^3*g) - (B^2*(b*c - a*d)^2*i^2*n^2 * \text{Log}[(b*(c + d*x))/(b*c - a*d)] * \text{Log}[a*g + b*g*x]^2) / (b^3*g) + (2*A*B*(b*c - a*d)^2*i^2*n * \text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]) / (b^3*g) + (2*a*B^2*d*(b*c - a*d)*i^2*n^2 * \text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]) / (b^3*g) - (B^2*(b*c - a*d)^2*i^2*n^2 * \text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]) / (b^3*g) + (2*B^2*(b*c - a*d)^2*i^2*n * \text{Log}[(a + b*x)^n] * \text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]) / (b^3*g) - (2*B^2*(b*c - a*d)^2*i^2*n * (\text{Log}[(a + b*x)^n] - \text{Log}[e*((a + b*x)/(c + d*x))^n] + \text{Log}[(c + d*x)^(-n)])) * \text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]) / (b^3*g) + (2*B^2*c*(b*c - a*d)*i^2*n^2 * \text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]) / (b^2*g) - (2*B^2*(b*c - a*d)^2*i^2*n * \text{Log}[(c + d*x)^(-n)] * \text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]) / (b^3*g) - (2*B^2*(b*c - a*d)^2*i^2*n^2 * \text{PolyLog}[3, -((d*(a + b*x))/(b*c - a*d))]) / (b^3*g) - (2*B^2*(b*c - a*d)^2*i^2*n^2 * \text{PolyLog}[3, (b*(c + d*x))/(b*c - a*d)]) / (b^3*g)
\end{aligned}$$
**Rule 2528**

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

```

**Rule 2523**

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.), x_Symbol] := Simp[x*(a +
  b*Log[c*Rfx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
  Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
  ionalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
  Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
  ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e
  , Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /;
  FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(Rfx_), x_Sy
  mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, Rfx, x]},
  Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
  Rfx, x] && IntegerQ[p]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
  )*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
  n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
  qQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
  g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
  )), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
  )^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x
  ), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rule 6688

```
Int[u_, x_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

### Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

### Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] := Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

### Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Symbol] :=
Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n]*(f +
g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m)], x], x, k + l*x], x] /; FreeQ[{a,
b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

### Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] := Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n]*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
```

]\*(f + g\*Log[h\*(i + j\*x)^m])/(i + j\*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, m, n}, x] && EqQ[e\*i - d\*j, 0]

### Rule 2433

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_.) + Log[(h\_.)\*((i\_.) + (j\_.)\*(x\_))^(m\_.)]\*(g\_.))\*((k\_.) + (l\_.)\*(x\_))^(r\_.), x\_Symbol] := Dist[1/e, Subst[Int[((k\*x)/d)^r\*(a + b\*Log[c\*x^n])^p\*(f + g\*Log[h\*(e\*i - d\*j)/e + (j\*x)/e]^m), x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e\*k - d\*l, 0]

### Rule 2375

Int[(Log[(d\_.)\*((e\_) + (f\_.)\*(x\_)^(m\_.))^(r\_.)]\*(a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/(x\_), x\_Symbol] := Simp[(Log[d\*(e + f\*x^m)^r]\*(a + b\*Log[c\*x^n])^(p + 1))/(b\*n\*(p + 1)), x] - Dist[(f\*m\*r)/(b\*n\*(p + 1)), Int[(x^(m - 1)\*(a + b\*Log[c\*x^n])^(p + 1))/(e + f\*x^m), x], x] /; FreeQ[{a, b, c, d, e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d\*e, 1]

### Rule 2317

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/((d\_) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^p)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

### Rule 2374

Int[(Log[(d\_.)\*((e\_) + (f\_.)\*(x\_)^(m\_.)))]\*(a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/(x\_), x\_Symbol] := -Simp[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^p)/m, x] + Dist[(b\*n\*p)/m, Int[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0] && EqQ[d\*e, 1]

### Rule 6589

Int[PolyLog[n\_, (c\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)]/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] := Simp[PolyLog[n + 1, c\*(a + b\*x)^p]/(e\*p), x] /; FreeQ[{a, b, c, d, e, n, p}, x] && EqQ[b\*d, a\*e]

### Rule 2499

Int[(Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]\*((s\_.) + Log[(i\_.)\*((g\_.) + (h\_.)\*(x\_))^(n\_.)]\*(t\_.))^(m\_.)/((j\_.) + (k\_.)\*(x\_)), x\_Symbol] := Simp[((s + t\*Log[i\*(g + h\*x)^n])^(m + 1)\*Log[



$$e^{(f(a + bx)^p(c + dx)^q)^r} / (k^n t^m (m + 1)), x] + (-\text{Dist}[(b^p r) / (k^n t^m (m + 1)), \text{Int}[(s + t \text{Log}[i(g + hx)^n])^{(m + 1)} / (a + bx), x], x] - \text{Dist}[(d^q r) / (k^n t^m (m + 1)), \text{Int}[(s + t \text{Log}[i(g + hx)^n])^{(m + 1)} / (c + dx), x], x]) / ; \text{FreeQ}\{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r\}, x] \&\& \text{NeQ}[b^p c - a^p d, 0] \&\& \text{EqQ}[h^j - g^k, 0] \&\& \text{IGtQ}[m, 0]$$

### Rule 2302

$$\text{Int}[(a + \text{Log}[c(x)^n] b)^p / x, x\_Symbol] \rightarrow \text{Dist}[1 / (b^n), \text{Subst}[\text{Int}[x^p, x], x, a + b \text{Log}[c x^n]], x] / ; \text{FreeQ}\{a, b, c, n, p\}, x]$$

### Rule 30

$$\text{Int}[x^m, x\_Symbol] \rightarrow \text{Simp}[x^{(m + 1)} / (m + 1), x] / ; \text{FreeQ}[m, x] \&\& \text{NeQ}[m, -1]$$

### Rule 2396

$$\text{Int}[(a + \text{Log}[c(d + ex)^n] b)^p / ((f + gx)(x)), x\_Symbol] \rightarrow \text{Simp}[(\text{Log}[e(f + gx)] / (ef - dg))^p / g, x] - \text{Dist}[(b e^n p) / g, \text{Int}[(\text{Log}[e(f + gx)] / (ef - dg))^{(p - 1)} / (d + ex), x], x] / ; \text{FreeQ}\{a, b, c, d, e, f, g, n, p\}, x] \&\& \text{NeQ}[ef - dg, 0] \&\& \text{IGtQ}[p, 1]$$

### Rule 2525

$$\text{Int}[(a + \text{Log}[c(\text{RFX})^p] b)^n (d + ex)^m, x\_Symbol] \rightarrow \text{Simp}[(d + ex)^{(m + 1)} (a + b \text{Log}[c \text{RFX}^p])^n / (e^{(m + 1)}), x] - \text{Dist}[(b^n p) / (e^{(m + 1)}), \text{Int}[\text{SimplifyIntegrand}[(d + ex)^{(m + 1)} (a + b \text{Log}[c \text{RFX}^p])^{(n - 1)} D[\text{RFX}, x] / \text{RFX}, x], x], x] / ; \text{FreeQ}\{a, b, c, d, e, m, p\}, x] \&\& \text{RationalFunctionQ}[\text{RFX}, x] \&\& \text{IGtQ}[n, 0] \&\& (\text{EqQ}[n, 1] \mid \mid \text{IntegerQ}[m]) \&\& \text{NeQ}[m, -1]$$

### Rule 2486

$$\text{Int}[\text{Log}[e(f + ax)^p(c + dx)^q)^r]^s, x\_Symbol] \rightarrow \text{Simp}[(a + bx) \text{Log}[e(f + ax)^p(c + dx)^q)^r] / b, x] + \text{Dist}[(q r s (b^p c - a^p d)) / b, \text{Int}[\text{Log}[e(f + ax)^p(c + dx)^q)^r]^{(s - 1)} / (c + dx), x], x] / ; \text{FreeQ}\{a, b, c, d, e, f, p, q, r, s\}, x] \&\& \text{NeQ}[b^p c - a^p d, 0] \&\& \text{EqQ}[p + q, 0] \&\& \text{IGtQ}[s, 0]$$

### Rule 31

```
Int[((a_) + (b_.)*(x_))^-1, x_Symbol] :> Simp[Log[RemoveContent[a + b*x,  
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{(172c + 172dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{ag + bgx} dx &= \int \left( \frac{29584d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2g} + \frac{172d(172c + 172dx)}{b^2g} \right) dx \\
&= \frac{(29584(bc - ad)^2) \int \frac{\left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{ag + bgx} dx}{b^2} + \frac{(172d) \int (172c + 172dx)}{b^2g} \\
&= \frac{29584d(bc - ad)x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2g} + \frac{14792(c + dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{bg} \\
&= \frac{29584d(bc - ad)x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2g} + \frac{14792(c + dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{bg} \\
&= \frac{29584d(bc - ad)x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2g} + \frac{14792(c + dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{bg} \\
&= \frac{29584d(bc - ad)x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2g} + \frac{14792(c + dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{bg} \\
&= -\frac{29584ABd(bc - ad)nx}{b^2g} + \frac{59168aBd(bc - ad)n \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3g} \\
&= -\frac{29584ABd(bc - ad)nx}{b^2g} - \frac{29584B^2d(bc - ad)n(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^3g} \\
&= -\frac{29584ABd(bc - ad)nx}{b^2g} - \frac{29584B^2d(bc - ad)n(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^3g} \\
&= -\frac{29584ABd(bc - ad)nx}{b^2g} - \frac{29584B^2d(bc - ad)n(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^3g} \\
&= -\frac{29584ABd(bc - ad)nx}{b^2g} - \frac{29584aB^2d(bc - ad)n^2 \log^2(a + bx)}{b^3g} + \frac{14792d(172c + 172dx)}{b^3g}
\end{aligned}$$

**Mathematica [B]** time = 3.0083, size = 1654, normalized size = 2.89

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x), x]
```

```
[Out] (i^2*(6*b*d*(2*b*c - a*d)*x*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2 + 3*b^2*d^2*x^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2 + 6*(b*c - a*d)^2*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2 - 12*b*B*c*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(a*d*Log[a/b + x]^2 - 2*a*d*Log[a/b + x]*(1 + Log[a + b*x]) + 2*(-(b*c) + a*d + Log[c/d + x]*(b*c + a*d*Log[a + b*x] - a*d*Log[(d*(a + b*x))/(- (b*c) + a*d)])) + (- (b*d*x) + a*d*Log[a + b*x])*Log[(a + b*x)/(c + d*x)] - 2*a*d*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] + 6*b^2*B*c^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(Log[a/b + x]^2 - 2*Log[a + b*x]*(Log[a/b + x] - Log[c/d + x] - Log[(a + b*x)/(c + d*x)]) - 2*(Log[c/d + x]*Log[(d*(a + b*x))/(- (b*c) + a*d)] + PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + 3*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(-4*a*d^2*(a + b*x)*(-1 + Log[a/b + x]) + 2*a^2*d^2*Log[a/b + x]^2 + 4*a*b*d*(c + d*x)*(-1 + Log[c/d + x]) + d^2*(b*x*(2*a - b*x) + 2*b^2*x^2*Log[a/b + x] - 2*a^2*Log[a + b*x]) - 2*d^2*(b*x*(-2*a + b*x) + 2*a^2*Log[a + b*x])*(Log[a/b + x] - Log[c/d + x] - Log[(a + b*x)/(c + d*x)]) + b^2*(d*x*(-2*c + d*x) - 2*d^2*x^2*Log[c/d + x] + 2*c^2*Log[c + d*x]) - 4*a^2*d^2*(Log[c/d + x]*Log[(d*(a + b*x))/(- (b*c) + a*d)] + PolyLog[2, (b*(c + d*x))/(b*c - a*d)])) + 4*b*B^2*c*n^2*(Log[(a + b*x)/(c + d*x)]*(-(a*d*Log[(a + b*x)/(c + d*x)]^2) + 6*(b*c - a*d)*Log[(b*c - a*d)/(b*c + b*d*x)] + 3*d*Log[(a + b*x)/(c + d*x)]*(a + b*x + a*Log[(b*c - a*d)/(b*c + b*d*x)])) + 6*(b*c - a*d + a*d*Log[(a + b*x)/(c + d*x)])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - 6*a*d*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))] - B^2*n^2*(6*b^2*c^2*Log[(b*c - a*d)/(c + d*x)] - 12*a*b*c*d*Log[(b*c - a*d)/(c + d*x)] + 6*a^2*d^2*Log[(b*c - a*d)/(c + d*x)] + 6*a*b*c*d*Log[(a + b*x)/(c + d*x)] - 6*a^2*d^2*x*Log[(a + b*x)/(c + d*x)] + 9*a^2*d^2*Log[(a + b*x)/(c + d*x)]^2 + 6*a*b*d^2*x*Log[(a + b*x)/(c + d*x)]^2 - 3*b^2*d^2*x^2*Log[(a + b*x)/(c + d*x)]^2 - 2*a^2*d^2*Log[(a + b*x)/(c + d*x)]^3 + 6*b^2*c^2*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + 12*a*b*c*d*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] - 18*a^2*d^2*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + 6*a^2*d^2*Log[(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] + 6*(b^2*c^2 + 2*a*b*c*d - 3*a^2*d^2 + 2*a^2*d^2*Log[(a + b*x)/(c + d*x)])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - 12*a^2*d^2*Pol
```

$y \log[3, (d*(a + b*x))/(b*(c + d*x))] - 6*b^2*B^2*c^2*n^2*(\log[-(b*c) + a*d]/(d*(a + b*x)))*\log[(a + b*x)/(c + d*x)]^2 - 2*\log[(a + b*x)/(c + d*x)]*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))] - 2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])/(6*b^3*g)$

**Maple [F]** time = 0.687, size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2}{bgx + ag} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*i\*x+c\*i)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g),x)

[Out] int((d\*i\*x+c\*i)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g),x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g),x, algorithm="maxima")

[Out]  $2*A^2*c*d*i^2*(x/(b*g) - a*\log(b*x + a)/(b^2*g)) + 1/2*A^2*d^2*i^2*(2*a^2*\log(b*x + a)/(b^3*g) + (b*x^2 - 2*a*x)/(b^2*g)) + A^2*c^2*i^2*\log(b*g*x + a*g)/(b*g) + 1/2*(B^2*b^2*d^2*i^2*x^2 + 2*(2*b^2*c*d*i^2 - a*b*d^2*i^2)*B^2*x + 2*(b^2*c^2*i^2 - 2*a*b*c*d*i^2 + a^2*d^2*i^2)*B^2*\log(b*x + a))*\log((d*x + c)^n)^2/(b^3*g) - \text{integrate}(- (B^2*b^3*c^3*i^2*\log(e)^2 + 2*A*B*b^3*c^3*i^2*\log(e) + (B^2*b^3*d^3*i^2*\log(e)^2 + 2*A*B*b^3*d^3*i^2*\log(e))*x^3 + 3*(B^2*b^3*c*d^2*i^2*\log(e)^2 + 2*A*B*b^3*c*d^2*i^2*\log(e))*x^2 + (B^2*b^3*d^3*i^2*x^3 + 3*B^2*b^3*c*d^2*i^2*x^2 + 3*B^2*b^3*c^2*d*i^2*x + B^2*b^3*c^3*i^2)*\log((b*x + a)^n)^2 + 3*(B^2*b^3*c^2*d*i^2*\log(e)^2 + 2*A*B*b^3*c^2*d*i^2*\log(e))*x + 2*(B^2*b^3*c^3*i^2*\log(e) + A*B*b^3*c^3*i^2 + (B^2*b^3*d^3*i^2*\log(e) + A*B*b^3*d^3*i^2))*x^3 + 3*(B^2*b^3*c*d^2*i^2*\log(e) + A*B*b^3*c*d^2*i^2)*x^2 + 3*(B^2*b^3*c^2*d*i^2*\log(e) + A*B*b^3*c^2*d*i^2)*x*\log((b*x + a)^n) - (2*B^2*b^3*c^3*i^2*\log(e) + 2*A*B*b^3*c^3*i^2 + (2*A*B*b^3*d^3*i^2 + (i^2*n + 2*i^2*\log(e))*B^2*b^3*d^3))*x^3 + (6*A*B*b^3*c*d^2*i^2 - (a*b^2*$

$$d^3 i^2 n - 2(2i^2 n + 3i^2 \log(e)) b^3 c d^2 B^2 x^2 + 2(3A B b^3 c^2 d i^2 + (2a b^2 c d^2 i^2 n - a^2 b d^3 i^2 n + 3b^3 c^2 d i^2 \log(e)) B^2) x + 2((b^3 c^2 d i^2 n - 2a b^2 c d^2 i^2 n + a^2 b d^3 i^2 n) B^2 x + (a b^2 c^2 d i^2 n - 2a^2 b c d^2 i^2 n + a^3 d^3 i^2 n) B^2) \log(bx + a) + 2(B^2 b^3 d^3 i^2 x^3 + 3B^2 b^3 c d^2 i^2 x^2 + 3B^2 b^3 c^2 d i^2 x + B^2 b^3 c^3 i^2) \log((bx + a)^n) \log((dx + c)^n) / (b^4 d g x^2 + a b^3 c g + (b^4 c g + a b^3 d g) x), x$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{A^2 d^2 i^2 x^2 + 2 A^2 c d i^2 x + A^2 c^2 i^2 + (B^2 d^2 i^2 x^2 + 2 B^2 c d i^2 x + B^2 c^2 i^2) \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right)^2 + 2 (A B d^2 i^2 x^2 + 2 A B c d i^2 x}{bgx + ag} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g), x, algorithm="fricas")

[Out] integral((A^2\*d^2\*i^2\*x^2 + 2\*A^2\*c\*d\*i^2\*x + A^2\*c^2\*i^2 + (B^2\*d^2\*i^2\*x^2 + 2\*B^2\*c\*d\*i^2\*x + B^2\*c^2\*i^2)\*log(e\*((b\*x + a)/(d\*x + c))^n))^2 + 2\*(A\*B\*d^2\*i^2\*x^2 + 2\*A\*B\*c\*d\*i^2\*x + A\*B\*c^2\*i^2)\*log(e\*((b\*x + a)/(d\*x + c))^n))/(b\*g\*x + a\*g), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*\*2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c)\*\*n))\*\*2/(b\*g\*x+a\*g), x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2 \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2}{bgx + ag} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g),x, algorithm="giac")

[Out] integrate((d\*i\*x + c\*i)^2\*(B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)^2/(b\*g\*x + a\*g), x)

$$3.173 \quad \int \frac{(ci+dx)^2 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ag+bgx)^2} dx$$

**Optimal.** Leaf size=472

$$\frac{4Bdi^2n(bc-ad)\text{PolyLog}\left(2, \frac{b(c+dx)}{d(a+bx)}\right) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{b^3g^2} + \frac{2B^2di^2n^2(bc-ad)\text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)}{b^3g^2} + \frac{4B^2di^2n^2(bc-ad)\text{PolyLog}\left(3, \frac{b(c+dx)}{d(a+bx)}\right)}{b^3g^2}$$

[Out]  $(-2*B^2*(b*c - a*d)*i^2*n^2*(c + d*x))/(b^2*g^2*(a + b*x)) - (2*B*(b*c - a*d)*i^2*n*(c + d*x)*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]))/(b^2*g^2*(a + b*x)) + (d^2*i^2*(a + b*x)*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2)/(b^3*g^2) - ((b*c - a*d)*i^2*(c + d*x)*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2)/(b^2*g^2*(a + b*x)) + (2*B*d*(b*c - a*d)*i^2*n*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])*\text{Log}[(b*c - a*d)/(b*(c + d*x))])/(b^3*g^2) - (2*d*(b*c - a*d)*i^2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2*\text{Log}[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^3*g^2) + (2*B^2*d*(b*c - a*d)*i^2*n^2*\text{PolyLog}[2, (d*(a + b*x))/(b*(c + d*x))])/(b^3*g^2) + (4*B*d*(b*c - a*d)*i^2*n*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])*\text{PolyLog}[2, (b*(c + d*x))/(d*(a + b*x))])/(b^3*g^2) + (4*B^2*d*(b*c - a*d)*i^2*n^2*\text{PolyLog}[3, (b*(c + d*x))/(d*(a + b*x))])/(b^3*g^2)$

**Rubi [B]** time = 3.76458, antiderivative size = 1309, normalized size of antiderivative = 2.77, number of steps used = 60, number of rules used = 21, integrand size = 45,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.467$ , Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 44, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610}

$$-\frac{aB^2d^2n^2 \log^2(a+bx)i^2}{b^3g^2} + \frac{B^2d(bc-ad)n^2 \log^2(a+bx)i^2}{b^3g^2} - \frac{2ABd(bc-ad)n \log^2(a+bx)i^2}{b^3g^2} - \frac{2B^2d(bc-ad) \log\left(-\frac{bc-ad}{d(a+bx)}\right)}{b^3g^2}$$

Antiderivative was successfully verified.

[In] Int[((c\*i + d\*i\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(a\*g + b\*g\*x)^2, x]

[Out]  $(-2*B^2*(b*c - a*d)^2*i^2*n^2)/(b^3*g^2*(a + b*x)) - (2*B^2*d*(b*c - a*d)*i^2*n^2*\text{Log}[a + b*x])/(b^3*g^2) - (2*A*B*d*(b*c - a*d)*i^2*n*\text{Log}[a + b*x]^2)/(b^3*g^2) - (a*B^2*d^2*i^2*n^2*\text{Log}[a + b*x]^2)/(b^3*g^2) + (B^2*d*(b*c - a*d)*i^2*n^2*\text{Log}[a + b*x]^2)/(b^3*g^2) - (2*B^2*d*(b*c - a*d)*i^2*\text{Log}[-((b*c - a*d)/(d*(a + b*x)))]*\text{Log}[e*((a + b*x)/(c + d*x))^n]^2)/(b^3*g^2) - (2*B^2*d*(b*c - a*d)*i^2*n^2*\text{PolyLog}[3, (b*(c + d*x))/(d*(a + b*x))])/(b^3*g^2)$



$$\begin{aligned}
& 2*d*(b*c - a*d)*i^2*\text{Log}[a + b*x]*\text{Log}[e*((a + b*x)/(c + d*x))^n]^2)/(b^3*g^2) \\
& - (2*B*(b*c - a*d)^2*i^2*n*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]))/(b^3*g^2*(a + b*x)) + (2*a*B*d^2*i^2*n*\text{Log}[a + b*x]*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]))/(b^3*g^2) - (2*B*d*(b*c - a*d)*i^2*n*\text{Log}[a + b*x]*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]))/(b^3*g^2) + (d^2*i^2*x*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2)/(b^2*g^2) - ((b*c - a*d)^2*i^2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2)/(b^3*g^2*(a + b*x)) + (2*d*(b*c - a*d)*i^2*\text{Log}[a + b*x]*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2)/(b^3*g^2) + (2*B^2*d*(b*c - a*d)*i^2*n^2*\text{Log}[c + d*x])/(b^3*g^2) + (2*B^2*c*d*i^2*n^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/(b^2*g^2) - (2*B^2*d*(b*c - a*d)*i^2*n^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/(b^3*g^2) - (2*B*c*d*i^2*n*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])*\text{Log}[c + d*x])/(b^2*g^2) + (2*B*d*(b*c - a*d)*i^2*n*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])*\text{Log}[c + d*x])/(b^3*g^2) - (B^2*c*d*i^2*n^2*\text{Log}[c + d*x]^2)/(b^2*g^2) + (B^2*d*(b*c - a*d)*i^2*n^2*\text{Log}[c + d*x]^2)/(b^3*g^2) + (4*A*B*d*(b*c - a*d)*i^2*n*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)])/(b^3*g^2) + (2*a*B^2*d^2*i^2*n^2*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)])/(b^3*g^2) - (2*B^2*d*(b*c - a*d)*i^2*n^2*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)])/(b^3*g^2) + (4*A*B*d*(b*c - a*d)*i^2*n*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))])/(b^3*g^2) + (2*a*B^2*d^2*i^2*n^2*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))])/(b^3*g^2) - (2*B^2*d*(b*c - a*d)*i^2*n^2*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))])/(b^3*g^2) + (2*B^2*c*d*i^2*n^2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])/(b^2*g^2) - (2*B^2*d*(b*c - a*d)*i^2*n^2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])/(b^3*g^2) + (4*B^2*d*(b*c - a*d)*i^2*n*\text{Log}[e*((a + b*x)/(c + d*x))^n]*\text{PolyLog}[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^3*g^2) + (4*B^2*d*(b*c - a*d)*i^2*n^2*\text{PolyLog}[3, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^3*g^2)
\end{aligned}$$

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

```

### Rule 2523

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] := Simp[x*(a + b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

```

### Rule 12

```

Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]

```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol]
:> Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(Rfx_), x_Symbol]
:> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, Rfx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[Rfx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(q_.), x_Symbol]
:> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol]
:> Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol]
:> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))])*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol]
:> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]/(x_), x_Symbol]
:> -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

Rule 44

```
Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

Rule 6688

```
Int[u_, x_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifierIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_.))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_.)*(x_.))^(q_.)*((h_.) + (i_.)*(x_.))^(r_.), x_Symbol] := Dist[1/e, Subst[Int[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_Symbol] := Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_.) + (e_.)*(x_)), x_Symbol]
:= Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
  Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b,
  c, d, e, n}, x] && IGtQ[p, 0]
```

### Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_Symbol]
:= With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
h*x)^t]^u)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s + 1))/(p*r*(s + 1)*(b*c
- a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q]^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
EqQ[p + q, 0] && NeQ[s, -1]
```

### Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] := -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q]^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

### Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))
^(q_.)]^(r_.)]^(s_.)*(u_), x_Symbol] := With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f,
p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

### Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] := With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /; !FalseQ[w] /; FreeQ[n, x]
```

### Rubi steps

$$\begin{aligned}
\int \frac{(173c + 173dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ag + bgx)^2} dx &= \int \left( \frac{29929d^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2g^2} + \frac{29929(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2g^2(a + bx)^2} \right) dx \\
&= \frac{(29929d^2) \int \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx}{b^2g^2} + \frac{(59858d(bc - ad)) \int \frac{\left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{a + bx} dx}{b^2g^2} \\
&= \frac{29929d^2x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2g^2} - \frac{29929(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3g^2(a + bx)} \\
&= \frac{29929d^2x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2g^2} - \frac{29929(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3g^2(a + bx)} \\
&= \frac{29929d^2x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2g^2} - \frac{29929(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3g^2(a + bx)} \\
&= \frac{29929d^2x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2g^2} - \frac{29929(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3g^2(a + bx)} \\
&= -\frac{59858B(bc - ad)^2n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3g^2(a + bx)} + \frac{59858aBd^2n \log(a + bx)}{b^3g^2} \\
&= -\frac{59858B^2d(bc - ad) \log(a + bx) \log^2 \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^3g^2} - \frac{59858B(bc - ad)}{b^3g^2} \\
&= -\frac{59858B^2d(bc - ad) \log \left( -\frac{bc-ad}{d(a+bx)} \right) \log^2 \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^3g^2} - \frac{59858B^2d(bc - ad)}{b^3g^2} \\
&= -\frac{59858B^2(bc - ad)^2n^2}{b^3g^2(a + bx)} - \frac{59858B^2d(bc - ad)n^2 \log(a + bx)}{b^3g^2} - \frac{59858B^2d(bc - ad)}{b^3g^2} \\
&= -\frac{59858B^2(bc - ad)^2n^2}{b^3g^2(a + bx)} - \frac{59858B^2d(bc - ad)n^2 \log(a + bx)}{b^3g^2} - \frac{59858B^2d(bc - ad)}{b^3g^2} \\
&= -\frac{59858B^2(bc - ad)^2n^2}{b^3g^2(a + bx)} - \frac{59858B^2d(bc - ad)n^2 \log(a + bx)}{b^3g^2} - \frac{59858B^2d(bc - ad)}{b^3g^2}
\end{aligned}$$



```

d*x)] + 3*a*d*Log[(a + b*x)/(c + d*x)]^2 + 3*b*d*x*Log[(a + b*x)/(c + d*x)
]^2 - (3*b^2*x*(c + d*x)*Log[(a + b*x)/(c + d*x)]^2)/(a + b*x) - 3*b*c*Log[
(-b*c) + a*d)/(d*(a + b*x))*Log[(a + b*x)/(c + d*x)]^2 - a*d*Log[(a + b*x)
)/(c + d*x)]^3 + 6*b*c*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*
x)] - 6*a*d*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + 3*a*d
*Log[(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] + 6*(b*c - a*d +
a*d*Log[(a + b*x)/(c + d*x)])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - 6*
(b*c - a*d)*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] + 6*b*c*Log[(a + b*x)/(c
+ d*x)]*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))] - 6*a*d*PolyLog[3, (d*(a +
b*x))/(b*(c + d*x))] + 6*b*c*PolyLog[3, (b*(c + d*x))/(d*(a + b*x)))]/(b*c
- a*d) - (B^2*d*n^2*(6*a^2*b*c*d + 6*a^2*b*d^2*x + 6*a^2*b*c*d*Log[(a + b*
x)/(c + d*x)] + 6*a^2*b*d^2*x*Log[(a + b*x)/(c + d*x)] + 12*a^2*b*c*d*Log[(-
b*c) + a*d)/(d*(a + b*x))*Log[(a + b*x)/(c + d*x)] + 12*a*b^2*c*d*x*Log[
(-b*c) + a*d)/(d*(a + b*x))*Log[(a + b*x)/(c + d*x)] + 6*a^2*b*c*d*Log[(a
+ b*x)/(c + d*x)]^2 + 3*a^3*d^2*Log[(a + b*x)/(c + d*x)]^2 + 9*a^2*b*d^2*x
*Log[(a + b*x)/(c + d*x)]^2 - 3*b^3*c*d*x^2*Log[(a + b*x)/(c + d*x)]^2 + 3*
a*b^2*d^2*x^2*Log[(a + b*x)/(c + d*x)]^2 - 6*a^2*b*c*d*Log[(-b*c) + a*d)/(
d*(a + b*x))*Log[(a + b*x)/(c + d*x)]^2 - 6*a*b^2*c*d*x*Log[(-b*c) + a*d)
/(d*(a + b*x))*Log[(a + b*x)/(c + d*x)]^2 - 2*a^3*d^2*Log[(a + b*x)/(c + d
*x)]^3 - 2*a^2*b*d^2*x*Log[(a + b*x)/(c + d*x)]^3 - 6*a*b^2*c^2*Log[(a + b*
x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] - 6*a^3*d^2*Log[(a + b*x)/(c +
d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] - 6*b^3*c^2*x*Log[(a + b*x)/(c + d*x)
]*Log[(b*c - a*d)/(b*c + b*d*x)] - 6*a^2*b*d^2*x*Log[(a + b*x)/(c + d*x)]*L
og[(b*c - a*d)/(b*c + b*d*x)] + 6*a^3*d^2*Log[(a + b*x)/(c + d*x)]^2*Log[(b
*c - a*d)/(b*c + b*d*x)] + 6*a^2*b*d^2*x*Log[(a + b*x)/(c + d*x)]^2*Log[(b*
c - a*d)/(b*c + b*d*x)] + 6*(a + b*x)*(-b^2*c^2) - a^2*d^2 + 2*a^2*d^2*Log
[(a + b*x)/(c + d*x))*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] + 12*a*b*c*d
*(a + b*x)*(-1 + Log[(a + b*x)/(c + d*x)])*PolyLog[2, (b*(c + d*x))/(d*(a +
b*x))] - 12*a^3*d^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))] - 12*a^2*b*d^2
*x*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))] + 12*a^2*b*c*d*PolyLog[3, (b*(c
+ d*x))/(d*(a + b*x))] + 12*a*b^2*c*d*x*PolyLog[3, (b*(c + d*x))/(d*(a + b*
x)))]/((b*c - a*d)*(a + b*x)))/(3*b^3*g^2)

```

---

**Maple [F]** time = 0.714, size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2}{(bgx + ag)^2} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*i\*x+c\*i)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^2,x)

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x)
```

**Maxima [F]** time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x,
algorithm="maxima")
```

```
[Out] -2*A*B*c^2*i^2*n*(1/(b^2*g^2*x + a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)
*g^2) - d*log(d*x + c)/((b^2*c - a*b*d)*g^2)) - A^2*(a^2/(b^4*g^2*x + a*b^3
*g^2) - x/(b^2*g^2) + 2*a*log(b*x + a)/(b^3*g^2))*d^2*i^2 + 2*A^2*c*d*i^2*(
a/(b^3*g^2*x + a*b^2*g^2) + log(b*x + a)/(b^2*g^2)) - 2*A*B*c^2*i^2*log(e*(
b*x/(d*x + c) + a/(d*x + c))^n)/(b^2*g^2*x + a*b*g^2) - A^2*c^2*i^2/(b^2*g^
2*x + a*b*g^2) + (B^2*b^2*d^2*i^2*x^2 + B^2*a*b*d^2*i^2*x - (b^2*c^2*i^2 -
2*a*b*c*d*i^2 + a^2*d^2*i^2)*B^2 + 2*((b^2*c*d*i^2 - a*b*d^2*i^2)*B^2*x + (
a*b*c*d*i^2 - a^2*d^2*i^2)*B^2)*log(b*x + a))*log((d*x + c)^n)^2/(b^4*g^2*x
+ a*b^3*g^2) - integrate(-(B^2*b^3*c^3*i^2*log(e)^2 + (B^2*b^3*d^3*i^2*log
(e)^2 + 2*A*B*b^3*d^3*i^2*log(e))*x^3 + 3*(B^2*b^3*c*d^2*i^2*log(e)^2 + 2*A
*B*b^3*c*d^2*i^2*log(e))*x^2 + (B^2*b^3*d^3*i^2*x^3 + 3*B^2*b^3*c*d^2*i^2*x
^2 + 3*B^2*b^3*c^2*d*i^2*x + B^2*b^3*c^3*i^2)*log((b*x + a)^n)^2 + (3*B^2*b
^3*c^2*d*i^2*log(e)^2 + 4*A*B*b^3*c^2*d*i^2*log(e))*x + 2*(B^2*b^3*c^3*i^2*
log(e) + (B^2*b^3*d^3*i^2*log(e) + A*B*b^3*d^3*i^2))*x^3 + 3*(B^2*b^3*c*d^2*
i^2*log(e) + A*B*b^3*c*d^2*i^2))*x^2 + (3*B^2*b^3*c^2*d*i^2*log(e) + 2*A*B*b
^3*c^2*d*i^2)*x)*log((b*x + a)^n) - 2*((A*B*b^3*d^3*i^2 + (i^2*n + i^2*log(
e))*B^2*b^3*d^3)*x^3 - (a*b^2*c^2*d*i^2*n - 2*a^2*b*c*d^2*i^2*n + a^3*d^3*i
^2*n - b^3*c^3*i^2*log(e))*B^2 + (3*A*B*b^3*c*d^2*i^2 + (2*a*b^2*d^3*i^2*n
+ 3*b^3*c*d^2*i^2*log(e))*B^2)*x^2 + (2*A*B*b^3*c^2*d*i^2 + (2*a*b^2*c*d^2*
i^2*n - (i^2*n - 3*i^2*log(e))*b^3*c^2*d)*B^2)*x + 2*((b^3*c*d^2*i^2*n - a
b^2*d^3*i^2*n)*B^2*x^2 + 2*(a*b^2*c*d^2*i^2*n - a^2*b*d^3*i^2*n)*B^2*x + (a
^2*b*c*d^2*i^2*n - a^3*d^3*i^2*n)*B^2)*log(b*x + a) + (B^2*b^3*d^3*i^2*x^3
+ 3*B^2*b^3*c*d^2*i^2*x^2 + 3*B^2*b^3*c^2*d*i^2*x + B^2*b^3*c^3*i^2)*log((b
*x + a)^n))*log((d*x + c)^n))/(b^5*d*g^2*x^3 + a^2*b^3*c*g^2 + (b^5*c*g^2 +
2*a*b^4*d*g^2)*x^2 + (2*a*b^4*c*g^2 + a^2*b^3*d*g^2)*x), x)
```



**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{A^2 d^2 i^2 x^2 + 2 A^2 c d i^2 x + A^2 c^2 i^2 + (B^2 d^2 i^2 x^2 + 2 B^2 c d i^2 x + B^2 c^2 i^2) \log \left( e \left( \frac{b x + a}{d x + c} \right)^n \right)^2 + 2 (A B d^2 i^2 x^2 + 2 A B c d i^2 x + A B c^2 i^2) \log \left( e \left( \frac{b x + a}{d x + c} \right)^n \right)}{b^2 g^2 x^2 + 2 a b g^2 x + a^2 g^2}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x,
algorithm="fricas")
```

```
[Out] integral((A^2*d^2*i^2*x^2 + 2*A^2*c*d*i^2*x + A^2*c^2*i^2 + (B^2*d^2*i^2*x^2 + 2*B^2*c*d*i^2*x + B^2*c^2*i^2)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*B*d^2*i^2*x^2 + 2*A*B*c*d*i^2*x + A*B*c^2*i^2)*log(e*((b*x + a)/(d*x + c))^n))/(b^2*g^2*x^2 + 2*a*b*g^2*x + a^2*g^2), x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**2,
,x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2 \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2}{(bgx + ag)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x,
algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(b*g*x + a*g)^2, x)
```

$$3.174 \quad \int \frac{(ci+dx)^2 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ag+bgx)^3} dx$$

**Optimal.** Leaf size=417

$$\frac{2Bd^2i^2n \text{PolyLog} \left( 2, \frac{b(c+dx)}{d(a+bx)} \right) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{b^3g^3} + \frac{2B^2d^2i^2n^2 \text{PolyLog} \left( 3, \frac{b(c+dx)}{d(a+bx)} \right)}{b^3g^3} - \frac{d^2i^2 \log \left( 1 - \frac{b(c+dx)}{d(a+bx)} \right) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{b^3g^3}$$

[Out]  $(-2*B^2*d*i^2*n^2*(c+d*x))/(b^2*g^3*(a+b*x)) - (B^2*i^2*n^2*(c+d*x)^2)/(4*b*g^3*(a+b*x)^2) - (2*B*d*i^2*n*(c+d*x)*(A+B*\text{Log}[e*((a+b*x)/(c+d*x))^n])/(b^2*g^3*(a+b*x)) - (B*i^2*n*(c+d*x)^2*(A+B*\text{Log}[e*((a+b*x)/(c+d*x))^n])/(2*b*g^3*(a+b*x)^2) - (d*i^2*(c+d*x)*(A+B*\text{Log}[e*((a+b*x)/(c+d*x))^n])^2)/(b^2*g^3*(a+b*x)) - (i^2*(c+d*x)^2*(A+B*\text{Log}[e*((a+b*x)/(c+d*x))^n])^2)/(2*b*g^3*(a+b*x)^2) - (d^2*i^2*(A+B*\text{Log}[e*((a+b*x)/(c+d*x))^n])^2*\text{Log}[1-(b*(c+d*x))/(d*(a+b*x))])/(b^3*g^3) + (2*B*d^2*i^2*n*(A+B*\text{Log}[e*((a+b*x)/(c+d*x))^n])*PolyLog[2,(b*(c+d*x))/(d*(a+b*x))])/(b^3*g^3) + (2*B^2*d^2*i^2*n^2*PolyLog[3,(b*(c+d*x))/(d*(a+b*x))])/(b^3*g^3)$

**Rubi [B]** time = 3.84122, antiderivative size = 1003, normalized size of antiderivative = 2.41, number of steps used = 68, number of rules used = 20, integrand size = 45,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.444$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610}

$$\frac{3B^2d^2n^2 \log^2(a+bx)i^2}{2b^3g^3} - \frac{ABd^2n \log^2(a+bx)i^2}{b^3g^3} - \frac{B^2d^2 \log \left( -\frac{bc-ad}{d(a+bx)} \right) \log^2 \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) i^2}{b^3g^3} - \frac{B^2d^2 \log(a+bx) \log^2 \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^3g^3}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[(c*i + d*i*x)^2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2/(a*g + b*g*x)^3, x]$

[Out]  $-(B^2*(b*c - a*d)^2*i^2*n^2)/(4*b^3*g^3*(a + b*x)^2) - (5*B^2*d*(b*c - a*d)*i^2*n^2)/(2*b^3*g^3*(a + b*x)) - (5*B^2*d^2*i^2*n^2*\text{Log}[a + b*x])/(2*b^3*g^3) - (A*B*d^2*i^2*n*\text{Log}[a + b*x]^2)/(b^3*g^3) + (3*B^2*d^2*i^2*n^2*\text{Log}[a + b*x]^2)/(2*b^3*g^3) - (B^2*d^2*i^2*\text{Log}[-((b*c - a*d)/(d*(a + b*x))])*\text{Log}[e*((a + b*x)/(c + d*x))^n]^2)/(b^3*g^3) - (B^2*d^2*i^2*\text{Log}[a + b*x]*\text{Log}[e*((a + b*x)/(c + d*x))^n]^2)/(b^3*g^3) - (B*(b*c - a*d)^2*i^2*n*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2)/(b^3*g^3)$

$$\begin{aligned} & ((a + b*x)/(c + d*x))^n) / (2*b^3*g^3*(a + b*x)^2) - (3*B*d*(b*c - a*d)*i^2*n*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]) / (b^3*g^3*(a + b*x)) - (3*B*d^2*i^2*n*\text{Log}[a + b*x]*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]) / (b^3*g^3) - ((b*c - a*d)^2*i^2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2) / (2*b^3*g^3*(a + b*x)^2) - (2*d*(b*c - a*d)*i^2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2) / (b^3*g^3*(a + b*x)) + (d^2*i^2*\text{Log}[a + b*x]*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2) / (b^3*g^3) + (5*B^2*d^2*i^2*n^2*\text{Log}[c + d*x]) / (2*b^3*g^3) - (3*B^2*d^2*i^2*n^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x]) / (b^3*g^3) + (3*B*d^2*i^2*n*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])*\text{Log}[c + d*x]) / (b^3*g^3) + (3*B^2*d^2*i^2*n^2*\text{Log}[c + d*x]^2) / (2*b^3*g^3) + (2*A*B*d^2*i^2*n*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)]) / (b^3*g^3) - (3*B^2*d^2*i^2*n^2*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)]) / (b^3*g^3) + (2*A*B*d^2*i^2*n*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]) / (b^3*g^3) - (3*B^2*d^2*i^2*n^2*\text{PolyLog}[2, -(d*(a + b*x))/(b*c - a*d)]) / (b^3*g^3) - (3*B^2*d^2*i^2*n^2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]) / (b^3*g^3) + (2*B^2*d^2*i^2*n*\text{Log}[e*((a + b*x)/(c + d*x))^n]*\text{PolyLog}[2, 1 + (b*c - a*d)/(d*(a + b*x))]) / (b^3*g^3) + (2*B^2*d^2*i^2*n^2*\text{PolyLog}[3, 1 + (b*c - a*d)/(d*(a + b*x))]) / (b^3*g^3) \end{aligned}$$
Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[ {u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x] }, Int[u, x] /; SumQ[u]
] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] :> Simp[ ((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n) / (e*(m + 1)), x] - Dist[(b*n*p) / (e*(m + 1)), Int[SimplifyIntegrand[ ((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x]) / RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
```

+ n + 2, 0])

#### Rule 2524

Int[((a\_.) + Log[(c\_.)\*(RFX\_)^(p\_.)]\*(b\_.))^(n\_.)/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] :> Simp[(Log[d + e\*x]\*(a + b\*Log[c\*RFX^p])^n)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[d + e\*x]\*(a + b\*Log[c\*RFX^p])^(n - 1)\*D[RFX, x])/RFX, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0]

#### Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*(RFX\_), x\_Symbol] :> With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n])^p, RFX, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFX, x] && IntegerQ[p]

#### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.)\*(x\_))^(q\_.), x\_Symbol] :> Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

#### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] :> Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

#### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :> Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

#### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :> Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

#### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rule 6688

```
Int[u_, x_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifierIntegrandQ[v, u, x]]
```

### Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]
```

### Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]*(b_.))^(p_.)*((f_.) + (g_.)*(x_)^(q_.))*((h_.) + (i_.)*(x_)^(r_.)), x_Symbol] := Dist[1/e, Subst[Int[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

### Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_Symbol] := Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]
```

### Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol] := Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e, Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]
```

### Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_)^(p_.))*((c_.) + (d_.)*(x_)^(q_.))^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_)^(t_.))^(u_.))*(v_), x_Symbol] := With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g + h*x)^t]^u)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s + 1))/(p*r*(s + 1)*(b*c - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
```

EqQ[p + q, 0] && NeQ[s, -1]

### Rule 2488

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.)/((g\_.) + (h\_.)\*(x\_)), x\_Symbol] := -Simp[(Log[-((b\*c - a\*d)/(d\*(a + b\*x)))]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/h, x] + Dist[(p\*r\*s\*(b\*c - a\*d))/h, Int[(Log[-((b\*c - a\*d)/(d\*(a + b\*x)))]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1))/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && EqQ[b\*g - a\*h, 0] && IGtQ[s, 0]

### Rule 2506

Int[Log[v\_]\*Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.)\*(u\_), x\_Symbol] := With[{g = Simplify[((v - 1)\*(c + d\*x))/(a + b\*x)], h = Simplify[u\*(a + b\*x)\*(c + d\*x)]}, -Simp[(h\*PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/(b\*c - a\*d), x] + Dist[h\*p\*r\*s, Int[(PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1))/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]

### Rule 6610

Int[(u\_)\*PolyLog[n\_, v\_], x\_Symbol] := With[{w = DerivativeDivides[v, u\*v, x]}, Simp[w\*PolyLog[n + 1, v], x] /; !FalseQ[w]] /; FreeQ[n, x]

### Rubi steps

$$\begin{aligned}
\int \frac{(174c + 174dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ag + bgx)^3} dx &= \int \left( \frac{30276(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2 g^3 (a + bx)^3} + \frac{60552d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2 g^3 (a + bx)^3} \right) dx \\
&= \frac{(30276d^2) \int \frac{\left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{a+bx} dx}{b^2 g^3} + \frac{(60552d(bc - ad)) \int \frac{\left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(a+bx)^2} dx}{b^2 g^3} \\
&= -\frac{15138(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3 g^3 (a + bx)^2} - \frac{60552d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3 g^3 (a + bx)^2} \\
&= -\frac{15138(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3 g^3 (a + bx)^2} - \frac{60552d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3 g^3 (a + bx)^2} \\
&= -\frac{15138(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3 g^3 (a + bx)^2} - \frac{60552d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3 g^3 (a + bx)^2} \\
&= -\frac{15138(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3 g^3 (a + bx)^2} - \frac{60552d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3 g^3 (a + bx)^2} \\
&= -\frac{15138B(bc - ad)^2 n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3 g^3 (a + bx)^2} - \frac{90828Bd(bc - ad)n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3 g^3 (a + bx)^2} \\
&= -\frac{30276B^2 d^2 \log(a + bx) \log^2 \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^3 g^3} - \frac{15138B(bc - ad)^2 n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3 g^3 (a + bx)^2} \\
&= -\frac{30276B^2 d^2 \log \left( -\frac{bc-ad}{d(a+bx)} \right) \log^2 \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^3 g^3} - \frac{30276B^2 d^2 \log(a + bx) \log^2 \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^3 g^3} \\
&= -\frac{7569B^2 (bc - ad)^2 n^2}{b^3 g^3 (a + bx)^2} - \frac{75690B^2 d (bc - ad) n^2}{b^3 g^3 (a + bx)} - \frac{75690B^2 d^2 n^2 \log(a + bx)}{b^3 g^3} \\
&= -\frac{7569B^2 (bc - ad)^2 n^2}{b^3 g^3 (a + bx)^2} - \frac{75690B^2 d (bc - ad) n^2}{b^3 g^3 (a + bx)} - \frac{75690B^2 d^2 n^2 \log(a + bx)}{b^3 g^3} \\
&= -\frac{7569B^2 (bc - ad)^2 n^2}{b^3 g^3 (a + bx)^2} - \frac{75690B^2 d (bc - ad) n^2}{b^3 g^3 (a + bx)} - \frac{75690B^2 d^2 n^2 \log(a + bx)}{b^3 g^3}
\end{aligned}$$



**Mathematica [B]** time = 14.4021, size = 4761, normalized size = 11.42

Result too large to show

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(a\*g + b\*g\*x)^3,x]

[Out]  $(d^2 i^2 \text{Log}[a + b x] (A + B (\text{Log}[e((a + b x)/(c + d x))^n] - n \text{Log}[(a + b x)/(c + d x)]))^2 / (b^3 g^3) + (2 * (-A^2 b^2 c d i^2) + a A^2 d^2 i^2 - 2 A b B c d i^2 (\text{Log}[e((a + b x)/(c + d x))^n] - n \text{Log}[(a + b x)/(c + d x)]) + 2 a A B d^2 i^2 (\text{Log}[e((a + b x)/(c + d x))^n] - n \text{Log}[(a + b x)/(c + d x)])) - b B^2 c d i^2 (\text{Log}[e((a + b x)/(c + d x))^n] - n \text{Log}[(a + b x)/(c + d x)])^2 + a B^2 d^2 i^2 (\text{Log}[e((a + b x)/(c + d x))^n] - n \text{Log}[(a + b x)/(c + d x)])^2) / (b^3 g^3 (a + b x)) + (-A^2 b^2 c^2 i^2) + 2 a A^2 b^2 c d i^2 - a^2 A^2 d^2 i^2 - 2 A a b^2 B c^2 i^2 (\text{Log}[e((a + b x)/(c + d x))^n] - n \text{Log}[(a + b x)/(c + d x)]) + 4 a A a b B c d i^2 (\text{Log}[e((a + b x)/(c + d x))^n] - n \text{Log}[(a + b x)/(c + d x)]) - 2 a^2 A A B d^2 i^2 (\text{Log}[e((a + b x)/(c + d x))^n] - n \text{Log}[(a + b x)/(c + d x)]) - b^2 B^2 c^2 i^2 (\text{Log}[e((a + b x)/(c + d x))^n] - n \text{Log}[(a + b x)/(c + d x)])^2 + 2 a b B^2 c d i^2 (\text{Log}[e((a + b x)/(c + d x))^n] - n \text{Log}[(a + b x)/(c + d x)])^2 - a^2 B^2 d^2 i^2 (\text{Log}[e((a + b x)/(c + d x))^n] - n \text{Log}[(a + b x)/(c + d x)])^2) / (2 b^3 g^3 (a + b x)^2) + (2 B c^2 i^2 n (A + B (\text{Log}[e((a + b x)/(c + d x))^n] - n \text{Log}[(a + b x)/(c + d x)])) * (-((a/b + x) * (2 \text{Log}[a/b + x] + 4 \text{Log}[a/b + x]^2)) / (8 (a + b x)^3 \text{Log}[a/b + x]) - ((b(c/d + x)) / ((-a + (b*c)/d))^3 (1 - (b(c/d + x)) / (-a + (b*c)/d))) - ((b^2(c/d + x)^2) / ((-a + (b*c)/d))^4 (1 - (b(c/d + x)) / (-a + (b*c)/d))^2) + (2 b(c/d + x)) / ((-a + (b*c)/d))^3 (1 - (b(c/d + x)) / (-a + (b*c)/d))) * \text{Log}[c/d + x] - \text{Log}[1 - (b(c/d + x)) / (-a + (b*c)/d)] / (-a + (b*c)/d)^2) / (2 b) - (-\text{Log}[a/b + x] + \text{Log}[c/d + x] + \text{Log}[a/(c + d x) + (b x)/(c + d x)]) / (2 b (a + b x)^2)) / g^3 + (4 B c d i^2 n (A + B (\text{Log}[e((a + b x)/(c + d x))^n] - n \text{Log}[(a + b x)/(c + d x)])) * (-((1 + \text{Log}[a/b + x]) / (b^2 (a + b x))) + (a(1 + 2 \text{Log}[a/b + x])) / (4 b^2 (a + b x)^2) - (-\text{Log}[c/d + x] / (b(a + b x))) + (d(\text{Log}[a + b x] / (b c - a d) - \text{Log}[c + d x] / (b c - a d))) / b) / b - (a(\text{Log}[c/d + x] + (d(a + b x)(b c - a d + d(a + b x) \text{Log}[a + b x] - d(a + b x) \text{Log}[c + d x])) / (b c - a d)^2)) / (2 b^2 (a + b x)^2) - ((a + 2 b x) * (-\text{Log}[a/b + x] + \text{Log}[c/d + x] + \text{Log}[a/(c + d x) + (b x)/(c + d x)])) / (2 b^2 (a + b x)^2)) / g^3 + (2 B d^2 i^2 n (A + B (\text{Log}[e((a + b x)/(c + d x))^n] - n \text{Log}[(a + b x)/(c + d x)])) * (\text{Log}[a/b + x]^2 / (2 b^3) + (2 a (1 + \text{Log}[a/b + x])) / (b^3 (a + b x)) - (a^2 (1 + 2 \text{Log}[a/b + x])) / (4 b^3 (a + b x)^2) + (2 a (-\text{Log}[c/d + x] / (b(a + b x))) + (d(\text{Log}[a + b x] / (b c - a d) - \text{Log}[c + d x] / (b c - a d))) / b) / b^2 + (a^2 (\text{Log}[c/d + x] + (d(a + b x)(b c - a d + d(a + b x) \text{Log}[a + b x] - d(a + b x) \text{Log}[c + d x])) / (b c - a d)^2)) / (2 b^3 (a + b x)^2) + ((a(3 a + 4 b x)) / (a + b x)^2 +$

$$\begin{aligned}
& 2*\text{Log}[a + b*x]*(-\text{Log}[a/b + x] + \text{Log}[c/d + x] + \text{Log}[a/(c + d*x) + (b*x)/(c + d*x)])/(2*b^3) - ((\text{Log}[c/d + x]*\text{Log}[(a + b*x)/(a - (b*c)/d)]/b + \text{PolyLog}[2, (b*d*(c/d + x))/(b*c - a*d)]/b)/b^2)/g^3 + (B^2*c*d*i^2*n^2*(2*a*\text{Log}[(a + b*x)/(c + d*x)]^2 - 4*(a + b*x)*\text{Log}[(a + b*x)/(c + d*x)]^2 - (4*(a + b*x)*(2*b*c - 2*a*d + 2*d*(a + b*x)*\text{Log}[a + b*x] + 2*(b*c - a*d)*\text{Log}[(a + b*x)/(c + d*x)] + 2*d*(a + b*x)*\text{Log}[a + b*x]*\text{Log}[(a + b*x)/(c + d*x)] - 2*d*(a + b*x)*\text{Log}[c + d*x] + 2*d*(a + b*x)*\text{Log}[(a + b*x)/(c + d*x)]*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] - d*(a + b*x)*( \text{Log}[a + b*x]*(\text{Log}[a + b*x] - 2*\text{Log}[(b*(c + d*x))/(b*c - a*d)]) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-(b*c) + a*d)] - d*(a + b*x)*(\text{Log}[(b*c - a*d)/(b*c + b*d*x)]*(2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] + \text{Log}[(b*c - a*d)/(b*c + b*d*x)]) - 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d + (a*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*\text{Log}[a + b*x] + 2*(b*c - a*d)^2*\text{Log}[(a + b*x)/(c + d*x)] + 4*d*(-(b*c) + a*d)*(a + b*x)*\text{Log}[(a + b*x)/(c + d*x)] - 4*d^2*(a + b*x)^2*\text{Log}[a + b*x]*\text{Log}[(a + b*x)/(c + d*x)] + 2*d^2*(a + b*x)^2*\text{Log}[c + d*x] - 4*d*(a + b*x)*(b*c - a*d + d*(a + b*x)*\text{Log}[a + b*x] - d*(a + b*x)*\text{Log}[c + d*x]) - 4*d^2*(a + b*x)^2*\text{Log}[(a + b*x)/(c + d*x)]*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] + 2*d^2*(a + b*x)^2*(\text{Log}[a + b*x]*(\text{Log}[a + b*x] - 2*\text{Log}[(b*(c + d*x))/(b*c - a*d)])) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-(b*c) + a*d)] + 2*d^2*(a + b*x)^2*(\text{Log}[(b*c - a*d)/(b*c + b*d*x)]*(2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] + \text{Log}[(b*c - a*d)/(b*c + b*d*x)]) - 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d)^2)/(2*b^2*g^3*(a + b*x)^2) - (B^2*c^2*i^2*n^2*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*\text{Log}[a + b*x] + 2*(b*c - a*d)^2*\text{Log}[(a + b*x)/(c + d*x)] + 4*d*(-(b*c) + a*d)*(a + b*x)*\text{Log}[(a + b*x)/(c + d*x)] - 4*d^2*(a + b*x)^2*\text{Log}[a + b*x]*\text{Log}[(a + b*x)/(c + d*x)] + 2*(b*c - a*d)^2*\text{Log}[(a + b*x)/(c + d*x)]^2 + 2*d^2*(a + b*x)^2*\text{Log}[c + d*x] - 4*d*(a + b*x)*(b*c - a*d + d*(a + b*x)*\text{Log}[a + b*x] - d*(a + b*x)*\text{Log}[c + d*x]) - 4*d^2*(a + b*x)^2*\text{Log}[(a + b*x)/(c + d*x)]*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] + 2*d^2*(a + b*x)^2*(\text{Log}[a + b*x]*(\text{Log}[a + b*x] - 2*\text{Log}[(b*(c + d*x))/(b*c - a*d)])) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-(b*c) + a*d)] + 2*d^2*(a + b*x)^2*(\text{Log}[(b*c - a*d)/(b*c + b*d*x)]*(2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] + \text{Log}[(b*c - a*d)/(b*c + b*d*x)]) - 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])))/(4*b*(b*c - a*d)^2*g^3*(a + b*x)^2) - (B^2*d^2*i^2*n^2*((2*x*(7*b^2*c^2 - 14*a*b*c*d + 7*a^2*d^2 - 6*d*(a + b*x)*(a*d - b*(2*c + d*x))*\text{Log}[a + b*x] + 6*(b*c - a*d)^2*\text{Log}[(a + b*x)/(c + d*x)] + 2*b^2*(c + d*x)^2*\text{Log}[(a + b*x)/(c + d*x)]^2 - 12*a*b*c*d*\text{Log}[c + d*x] + 6*a^2*d^2*\text{Log}[c + d*x] - 12*b^2*c*d*x*\text{Log}[c + d*x] - 6*b^2*d^2*x^2*\text{Log}[c + d*x]))/(a + b*x) + (b*x^2*(b^2*c^2 - 8*a*b*c*d + 7*a^2*d^2 - 6*b^2*c*d*x + 6*a*b*d^2*x - 6*d^2*(a + b*x)^2*\text{Log}[a + b*x] + 2*(b*c - a*d)*(b*c - 3*a*d - 2*b*d*x)*\text{Log}[(a + b*x)/(c + d*x)] + 2*b*(c + d*x)*(b*c - 2*a*d - b*d*x)*\text{Log}[(a + b*x)/(c + d*x)]^2 + 6*a^2*d^2*\text{Log}[c + d*x] + 12*a*b*d^2*x*\text{Log}[c + d*x] + 6*b^2*d^2*x^2*\text{Log}[c + d*x]))/(a + b*x)^2 - 2*(12*b*c^2 - 18*a*c*d + (6*a^2*d^2)/b - 3*b*c*d*x + 3*a*d^2*x + 12*a*c*d*\text{Log}[a/b + x] - (6*a^2*d^2*\text{Log}[a/b + x])/b + 3*b*c^2*\text{Log}[a/b + x]^2 - 6*a*c*d*\text{Log}[a/b + x]^2 + (3*a^2*d^2*\text{Log}[a/b + x]^2)/b - 12*b*c^2*\text{Log}[c/d + x] + 6*a*c*d*\text{Log}[c/d + x] + 7*b*c^2*\text{Log}[a + b*x] - 14*a*c*d*\text{Log}[a +
\end{aligned}$$

$b*x] + (4*a^2*d^2*Log[a + b*x])/b + 12*b*c*d*x*Log[a + b*x] - 6*a*d^2*x*Lo$   
 $g[a + b*x] + 3*b*d^2*x^2*Log[a + b*x] - 6*b*c^2*Log[a/b + x]*Log[a + b*x] +$   
 $12*a*c*d*Log[a/b + x]*Log[a + b*x] - (6*a^2*d^2*Log[a/b + x]*Log[a + b*x])$   
 $/b + 6*b*c^2*Log[c/d + x]*Log[a + b*x] - 12*a*c*d*Log[c/d + x]*Log[a + b*x]$   
 $+ (6*a^2*d^2*Log[c/d + x]*Log[a + b*x])/b - 6*b*c^2*Log[c/d + x]*Log[(d*(a$   
 $+ b*x))/(-b*c) + a*d] + 12*a*c*d*Log[c/d + x]*Log[(d*(a + b*x))/(-b*c$   
 $+ a*d)] - (6*a^2*d^2*Log[c/d + x]*Log[(d*(a + b*x))/(-b*c) + a*d])/b - 2*$   
 $b*c^2*Log[(b*c - a*d)/(c + d*x)] + 4*a*c*d*Log[(b*c - a*d)/(c + d*x)] - (2*$   
 $a^2*d^2*Log[(b*c - a*d)/(c + d*x)])/b - 2*a*c*d*Log[(a + b*x)/(c + d*x)] +$   
 $(2*a^2*d^2*Log[(a + b*x)/(c + d*x)])/b - 2*b*c*d*x*Log[(a + b*x)/(c + d*x)]$   
 $+ 2*a*d^2*x*Log[(a + b*x)/(c + d*x)] + 6*b*c^2*Log[a + b*x]*Log[(a + b*x)/$   
 $(c + d*x)] - 12*a*c*d*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] + (6*a^2*d^2*Lo$   
 $g[a + b*x]*Log[(a + b*x)/(c + d*x)])/b + 4*a*c*d*Log[(a + b*x)/(c + d*x)]^2$   
 $- (3*a^2*d^2*Log[(a + b*x)/(c + d*x)]^2)/b + 4*b*c*d*x*Log[(a + b*x)/(c +$   
 $d*x)]^2 - 2*a*d^2*x*Log[(a + b*x)/(c + d*x)]^2 + b*d^2*x^2*Log[(a + b*x)/(c$   
 $+ d*x)]^2 - 2*b*c^2*Log[(-b*c) + a*d]/(d*(a + b*x))*Log[(a + b*x)/(c + d$   
 $*x)]^2 - (4*a*c*d*Log[(a + b*x)/(c + d*x)]^3)/3 + (2*a^2*d^2*Log[(a + b*x)/$   
 $(c + d*x)]^3)/(3*b) + 3*b*c^2*Log[c + d*x] - 12*b*c*d*x*Log[c + d*x] + 6*a*$   
 $d^2*x*Log[c + d*x] - 3*b*d^2*x^2*Log[c + d*x] + 6*b*c^2*Log[(a + b*x)/(c +$   
 $d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] - 12*a*c*d*Log[(a + b*x)/(c + d*x)]*Lo$   
 $g[(b*c - a*d)/(b*c + b*d*x)] + (6*a^2*d^2*Log[(a + b*x)/(c + d*x)]*Log[(b*c$   
 $- a*d)/(b*c + b*d*x]))/b + 4*a*c*d*Log[(a + b*x)/(c + d*x)]^2*Log[(b*c - a$   
 $d)/(b*c + b*d*x)] - (2*a^2*d^2*Log[(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d)/$   
 $(b*c + b*d*x)])/b + (2*(3*(b*c - a*d)^2 - 2*a*d*(-2*b*c + a*d)*Log[(a + b*x)$   
 $)/(c + d*x))*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))]/b - (6*(b*c - a*d)^2$   
 $*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]/b + 4*b*c^2*Log[(a + b*x)/(c + d*x)$   
 $]PolyLog[2, (b*(c + d*x))/(d*(a + b*x))] - 8*a*c*d*PolyLog[3, (d*(a + b*x)$   
 $)/(b*(c + d*x))] + (4*a^2*d^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))]/b +$   
 $4*b*c^2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))]))/(4*b^2*(b*c - a*d)^2*g^3$   
 $)$

**Maple [F]** time = 0.748, size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2}{(bgx + ag)^3} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*i\*x+c\*i)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^3,x)

[Out] int((d\*i\*x+c\*i)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^3,x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x,
algorithm="maxima")
```

```
[Out] -A*B*c*d*i^2*n*((3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*d)*x)/((b^5*c - a*b^4*d)
)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)*g^3) +
2*(2*b*c*d - a*d^2)*log(b*x + a)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3
) - 2*(2*b*c*d - a*d^2)*log(d*x + c)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)
*g^3)) + 1/2*A*B*c^2*i^2*n*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*
x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + 2*d^2*lo
g(b*x + a)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/
((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3)) + 1/2*A^2*d^2*i^2*((4*a*b*x + 3*a
^2)/(b^5*g^3*x^2 + 2*a*b^4*g^3*x + a^2*b^3*g^3) + 2*log(b*x + a)/(b^3*g^3))
- 2*(2*b*x + a)*A*B*c*d*i^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^4*g^
3*x^2 + 2*a*b^3*g^3*x + a^2*b^2*g^3) - (2*b*x + a)*A^2*c*d*i^2/(b^4*g^3*x^2
+ 2*a*b^3*g^3*x + a^2*b^2*g^3) - A*B*c^2*i^2*log(e*(b*x/(d*x + c) + a/(d*x
+ c))^n)/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) - 1/2*A^2*c^2*i^2/(b^3*
g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) - 1/2*(4*(b^2*c*d*i^2 - a*b*d^2*i^2)*B
^2*x + (b^2*c^2*i^2 + 2*a*b*c*d*i^2 - 3*a^2*d^2*i^2)*B^2 - 2*(B^2*b^2*d^2*i
^2*x^2 + 2*B^2*a*b*d^2*i^2*x + B^2*a^2*d^2*i^2)*log(b*x + a))*log((d*x + c)
^n)^2/(b^5*g^3*x^2 + 2*a*b^4*g^3*x + a^2*b^3*g^3) - integrate(-(3*B^2*b^3*c
^2*d*i^2*x*log(e)^2 + B^2*b^3*c^3*i^2*log(e)^2 + (B^2*b^3*d^3*i^2*log(e)^2
+ 2*A*B*b^3*d^3*i^2*log(e))*x^3 + (3*B^2*b^3*c*d^2*i^2*log(e)^2 + 2*A*B*b^3
*c*d^2*i^2*log(e))*x^2 + (B^2*b^3*d^3*i^2*x^3 + 3*B^2*b^3*c*d^2*i^2*x^2 + 3
*B^2*b^3*c^2*d*i^2*x + B^2*b^3*c^3*i^2)*log((b*x + a)^n)^2 + 2*(3*B^2*b^3*c
^2*d*i^2*x*log(e) + B^2*b^3*c^3*i^2*log(e) + (B^2*b^3*d^3*i^2*log(e) + A*B*
b^3*d^3*i^2)*x^3 + (3*B^2*b^3*c*d^2*i^2*log(e) + A*B*b^3*c*d^2*i^2)*x^2)*lo
g((b*x + a)^n) + ((6*a*b^2*c*d^2*i^2*n - 7*a^2*b*d^3*i^2*n + (i^2*n - 6*i^2
*log(e))*b^3*c^2*d)*B^2*x - 2*(B^2*b^3*d^3*i^2*log(e) + A*B*b^3*d^3*i^2)*x^
3 + (a*b^2*c^2*d*i^2*n + 2*a^2*b*c*d^2*i^2*n - 3*a^3*d^3*i^2*n - 2*b^3*c^3*
i^2*log(e))*B^2 - 2*(A*B*b^3*c*d^2*i^2 + (2*a*b^2*d^3*i^2*n - (2*i^2*n - 3*
i^2*log(e))*b^3*c*d^2)*B^2)*x^2 - 2*(B^2*b^3*d^3*i^2*n*x^3 + 3*B^2*a*b^2*d^
3*i^2*n*x^2 + 3*B^2*a^2*b*d^3*i^2*n*x + B^2*a^3*d^3*i^2*n)*log(b*x + a) - 2
*(B^2*b^3*d^3*i^2*x^3 + 3*B^2*b^3*c*d^2*i^2*x^2 + 3*B^2*b^3*c^2*d*i^2*x + B
^2*b^3*c^3*i^2)*log((b*x + a)^n))*log((d*x + c)^n))/(b^6*d*g^3*x^4 + a^3*b^
3*c*g^3 + (b^6*c*g^3 + 3*a*b^5*d*g^3)*x^3 + 3*(a*b^5*c*g^3 + a^2*b^4*d*g^3)
*x^2 + (3*a^2*b^4*c*g^3 + a^3*b^3*d*g^3)*x), x)
```

---

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{A^2 d^2 i^2 x^2 + 2 A^2 c d i^2 x + A^2 c^2 i^2 + (B^2 d^2 i^2 x^2 + 2 B^2 c d i^2 x + B^2 c^2 i^2) \log \left( e \left( \frac{b x + a}{d x + c} \right)^n \right)^2 + 2 (A B d^2 i^2 x^2 + 2 A B c d i^2 x + A B c^2 i^2) \log \left( e \left( \frac{b x + a}{d x + c} \right)^n \right)}{b^3 g^3 x^3 + 3 a b^2 g^3 x^2 + 3 a^2 b g^3 x + a^3 g^3}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^3,x,  
algorithm="fricas")

[Out] integral((A^2\*d^2\*i^2\*x^2 + 2\*A^2\*c\*d\*i^2\*x + A^2\*c^2\*i^2 + (B^2\*d^2\*i^2\*x^2 + 2\*B^2\*c\*d\*i^2\*x + B^2\*c^2\*i^2)\*log(e\*((b\*x + a)/(d\*x + c))^n)^2 + 2\*(A\*B\*d^2\*i^2\*x^2 + 2\*A\*B\*c\*d\*i^2\*x + A\*B\*c^2\*i^2)\*log(e\*((b\*x + a)/(d\*x + c))^n))/(b^3\*g^3\*x^3 + 3\*a\*b^2\*g^3\*x^2 + 3\*a^2\*b\*g^3\*x + a^3\*g^3), x)

---

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*\*2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n))\*\*2/(b\*g\*x+a\*g)\*\*3,x)

[Out] Timed out

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2 \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2}{(bgx + ag)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x,  
algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(b*g*x +  
a*g)^3, x)
```

$$3.175 \quad \int \frac{(ci+dx)^2 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ag+bgx)^4} dx$$

**Optimal.** Leaf size=157

$$\frac{i^2(c+dx)^3 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)^2}{3g^4(a+bx)^3(bc-ad)} - \frac{2Bi^2n(c+dx)^3 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{9g^4(a+bx)^3(bc-ad)} - \frac{2B^2i^2n^2(c+dx)^3}{27g^4(a+bx)^3(bc-ad)}$$

[Out]  $(-2*B^2*i^2*n^2*(c+d*x)^3)/(27*(b*c-a*d)*g^4*(a+b*x)^3) - (2*B*i^2*n*(c+d*x)^3*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(9*(b*c-a*d)*g^4*(a+b*x)^3) - (i^2*(c+d*x)^3*(A+B*Log[e*((a+b*x)/(c+d*x))^n])^2)/(3*(b*c-a*d)*g^4*(a+b*x)^3)$

**Rubi [C]** time = 3.1704, antiderivative size = 889, normalized size of antiderivative = 5.66, number of steps used = 86, number of rules used = 11, integrand size = 45,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.244$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2i^2n^2 \log^2(a+bx)d^3}{3b^3(bc-ad)g^4} + \frac{B^2i^2n^2 \log^2(c+dx)d^3}{3b^3(bc-ad)g^4} - \frac{2B^2i^2n^2 \log(a+bx)d^3}{9b^3(bc-ad)g^4} - \frac{2Bi^2n \log(a+bx) \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) d^3}{3b^3(bc-ad)g^4}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[\left(\left(\left(c*i+d*i*x\right)^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n])^2\right)/(a*g+b*g*x)^4,x]$

[Out]  $(-2*B^2*(b*c-a*d)^2*i^2*n^2)/(27*b^3*g^4*(a+b*x)^3) - (2*B^2*d*(b*c-a*d)*i^2*n^2)/(9*b^3*g^4*(a+b*x)^2) - (2*B^2*d^2*i^2*n^2)/(9*b^3*g^4*(a+b*x)) - (2*B^2*d^3*i^2*n^2*Log[a+b*x])/(9*b^3*(b*c-a*d)*g^4) + (B^2*d^3*i^2*n^2*Log[a+b*x]^2)/(3*b^3*(b*c-a*d)*g^4) - (2*B*(b*c-a*d)^2*i^2*n*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(9*b^3*g^4*(a+b*x)^3) - (2*B*d*(b*c-a*d)*i^2*n*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(3*b^3*g^4*(a+b*x)^2) - (2*B*d^2*i^2*n*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(3*b^3*g^4*(a+b*x)) - (2*B*d^3*i^2*n*Log[a+b*x]*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(3*b^3*(b*c-a*d)*g^4) - ((b*c-a*d)^2*i^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n])^2)/(3*b^3*g^4*(a+b*x)^3) - (d*(b*c-a*d)*i^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n])^2)/(b^3*g^4*(a+b*x)^2) - (d^2*i^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n])^2)/(b^3*g^4*(a+b*x)) + (2*B^2*d^3*i^2*n^2*Log[c+d*x])/(9*b^3*(b*c-a*d)*g^4) - (2*B^2*d^3*i^2*n^2*Log[-((d*(a+b*x))/($

$$b*c - a*d)) * \text{Log}[c + d*x] / (3*b^3*(b*c - a*d)*g^4) + (2*B*d^3*i^2*n*(A + B * \text{Log}[e*((a + b*x)/(c + d*x))^n]) * \text{Log}[c + d*x] / (3*b^3*(b*c - a*d)*g^4) + (B^2*d^3*i^2*n^2 * \text{Log}[c + d*x]^2) / (3*b^3*(b*c - a*d)*g^4) - (2*B^2*d^3*i^2*n^2 * \text{Log}[a + b*x] * \text{Log}[(b*(c + d*x))/(b*c - a*d)]) / (3*b^3*(b*c - a*d)*g^4) - (2*B^2*d^3*i^2*n^2 * \text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]) / (3*b^3*(b*c - a*d)*g^4) - (2*B^2*d^3*i^2*n^2 * \text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]) / (3*b^3*(b*c - a*d)*g^4)$$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int(((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int(((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

### Rule 2524

```
Int(((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

### Rule 2418



```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e^n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))])*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rubi steps

$$\begin{aligned}
\int \frac{(175c + 175dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ag + bgx)^4} dx &= \int \left( \frac{30625(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2 g^4 (a + bx)^4} + \frac{61250d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2 g^4 (a + bx)^4} \right) dx \\
&= \frac{(30625d^2) \int \frac{\left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(a+bx)^2} dx}{b^2 g^4} + \frac{(61250d(bc - ad)) \int \frac{\left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(a+bx)^3} dx}{b^2 g^4} \\
&= -\frac{30625(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3b^3 g^4 (a + bx)^3} - \frac{30625d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3 g^4 (a + bx)^3} \\
&= -\frac{30625(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3b^3 g^4 (a + bx)^3} - \frac{30625d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3 g^4 (a + bx)^3} \\
&= -\frac{30625(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3b^3 g^4 (a + bx)^3} - \frac{30625d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3 g^4 (a + bx)^3} \\
&= -\frac{30625(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3b^3 g^4 (a + bx)^3} - \frac{30625d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3 g^4 (a + bx)^3} \\
&= -\frac{61250B(bc - ad)^2 n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{9b^3 g^4 (a + bx)^3} - \frac{61250Bd(bc - ad)n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3b^3 g^4 (a + bx)^3} \\
&= -\frac{61250B(bc - ad)^2 n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{9b^3 g^4 (a + bx)^3} - \frac{61250Bd(bc - ad)n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3b^3 g^4 (a + bx)^3} \\
&= -\frac{61250B(bc - ad)^2 n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{9b^3 g^4 (a + bx)^3} - \frac{61250Bd(bc - ad)n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3b^3 g^4 (a + bx)^3} \\
&= -\frac{61250B^2(bc - ad)^2 n^2}{27b^3 g^4 (a + bx)^3} - \frac{61250B^2 d(bc - ad)n^2}{9b^3 g^4 (a + bx)^2} - \frac{61250B^2 d^2 n^2}{9b^3 g^4 (a + bx)} - \frac{61250B^2 d^2 n^2}{9b^3 g^4 (a + bx)} \\
&= -\frac{61250B^2(bc - ad)^2 n^2}{27b^3 g^4 (a + bx)^3} - \frac{61250B^2 d(bc - ad)n^2}{9b^3 g^4 (a + bx)^2} - \frac{61250B^2 d^2 n^2}{9b^3 g^4 (a + bx)} - \frac{61250B^2 d^2 n^2}{9b^3 g^4 (a + bx)} \\
&= -\frac{61250B^2(bc - ad)^2 n^2}{27b^3 g^4 (a + bx)^3} - \frac{61250B^2 d(bc - ad)n^2}{9b^3 g^4 (a + bx)^2} - \frac{61250B^2 d^2 n^2}{9b^3 g^4 (a + bx)} - \frac{61250B^2 d^2 n^2}{9b^3 g^4 (a + bx)}
\end{aligned}$$

**Mathematica [C]** time = 2.40232, size = 1415, normalized size = 9.01

result too large to display

Antiderivative was successfully verified.

[In] Integrate[(((c\*i + d\*i\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(a\*g + b\*g\*x)^4,x]

[Out] 
$$-(i^2*(18*(b*c - a*d)^3*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2 + 54*d*(b*c - a*d)^2*(a + b*x)*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2 - 54*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2 + 54*B*d^2*n*(a + b*x)^2*(2*(b*c - a*d)*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]) + 2*d*(a + b*x)*\text{Log}[a + b*x]*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]) - 2*d*(a + b*x)*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])*\text{Log}[c + d*x] + 2*B*n*(b*c - a*d + d*(a + b*x)*\text{Log}[a + b*x] - d*(a + b*x)*\text{Log}[c + d*x]) - B*d*n*(a + b*x)*(\text{Log}[a + b*x]*(\text{Log}[a + b*x] - 2*\text{Log}[(b*(c + d*x))/(b*c - a*d)]) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-(b*c) + a*d)]) + B*d*n*(a + b*x)*((2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] - \text{Log}[c + d*x])*\text{Log}[c + d*x] + 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])) + 27*B*d*n*(a + b*x)*(2*(b*c - a*d)^2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]) + 4*d*(-(b*c) + a*d)*(a + b*x)*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]) - 4*d^2*(a + b*x)^2*\text{Log}[a + b*x]*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]) + 4*d^2*(a + b*x)^2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])*\text{Log}[c + d*x] - 4*B*d*n*(a + b*x)*(b*c - a*d + d*(a + b*x)*\text{Log}[a + b*x] - d*(a + b*x)*\text{Log}[c + d*x]) + B*n*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*\text{Log}[a + b*x] + 2*d^2*(a + b*x)^2*\text{Log}[c + d*x]) + 2*B*d^2*n*(a + b*x)^2*(\text{Log}[a + b*x]*(\text{Log}[a + b*x] - 2*\text{Log}[(b*(c + d*x))/(b*c - a*d)]) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 2*B*d^2*n*(a + b*x)^2*((2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] - \text{Log}[c + d*x])*\text{Log}[c + d*x] + 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])) + B*n*(12*(b*c - a*d)^3*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]) - 18*d*(b*c - a*d)^2*(a + b*x)*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]) + 36*d^2*(b*c - a*d)*(a + b*x)^2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]) + 36*d^3*(a + b*x)^3*\text{Log}[a + b*x]*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]) - 36*d^3*(a + b*x)^3*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])*\text{Log}[c + d*x] + 36*B*d^2*n*(a + b*x)^2*(b*c - a*d + d*(a + b*x)*\text{Log}[a + b*x] - d*(a + b*x)*\text{Log}[c + d*x]) - 9*B*d*n*(a + b*x)*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*\text{Log}[a + b*x] + 2*d^2*(a + b*x)^2*\text{Log}[c + d*x]) + 2*B*n*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*\text{Log}[a + b*x] - 6*d^3*(a + b*x)^3*\text{Log}[c + d*x]) - 18*B*d^3*n*(a + b*x)^3*(\text{Log}[a + b*x]*(\text{Log}[a + b*x] - 2*\text{Log}[(b*(c + d*x))/(b*c - a*d)]) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 18*B*d^3*n*(a + b*x)^3*((2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] - \text{Log}[c + d*x])*\text{Log}[c + d*x] + 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])))/(54*b^3*(b*c - a*d)*g^4*(a + b*x)^3)$$

---

**Maple [F]** time = 0.778, size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2}{(bgx + ag)^4} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*i\*x+c\*i)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^4,x)

[Out] int((d\*i\*x+c\*i)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^4,x)

---

**Maxima [B]** time = 3.15139, size = 7544, normalized size = 48.05

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^4,x,  
algorithm="maxima")

[Out] 
$$\begin{aligned} & -1/9*A*B*d^2*i^2*n*((11*a^2*b^2*c^2 - 7*a^3*b*c*d + 2*a^4*d^2 + 6*(3*b^4*c^2 \\ & 2 - 3*a*b^3*c*d + a^2*b^2*d^2)*x^2 + 3*(9*a*b^3*c^2 - 7*a^2*b^2*c*d + 2*a^3 \\ & *b*d^2)*x)/((b^8*c^2 - 2*a*b^7*c*d + a^2*b^6*d^2)*g^4*x^3 + 3*(a*b^7*c^2 - \\ & 2*a^2*b^6*c*d + a^3*b^5*d^2)*g^4*x^2 + 3*(a^2*b^6*c^2 - 2*a^3*b^5*c*d + a^4 \\ & *b^4*d^2)*g^4*x + (a^3*b^5*c^2 - 2*a^4*b^4*c*d + a^5*b^3*d^2)*g^4) + 6*(3*b \\ & ^2*c^2*d - 3*a*b*c*d^2 + a^2*d^3)*\log(b*x + a)/((b^6*c^3 - 3*a*b^5*c^2*d + \\ & 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^4) - 6*(3*b^2*c^2*d - 3*a*b*c*d^2 + a^2*d^3 \\ & 3)*\log(d*x + c)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)* \\ & g^4) - 1/9*A*B*c^2*i^2*n*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 \\ & d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4 \\ & *x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 \\ & - 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5* \\ & b*d^2)*g^4) + 6*d^3*\log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 \\ & 2 - a^3*b*d^3)*g^4) - 6*d^3*\log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2* \\ & b^2*c*d^2 - a^3*b*d^3)*g^4) - 1/9*A*B*c*d*i^2*n*((5*a*b^2*c^2 - 22*a^2*b*c \\ & *d + 5*a^3*d^2 - 6*(3*b^3*c*d - a*b^2*d^2)*x^2 + 3*(3*b^3*c^2 - 16*a*b^2*c*d \\ & d + 5*a^2*b*d^2)*x)/((b^7*c^2 - 2*a*b^6*c*d + a^2*b^5*d^2)*g^4*x^3 + 3*(a*b \\ & ^6*c^2 - 2*a^2*b^5*c*d + a^3*b^4*d^2)*g^4*x^2 + 3*(a^2*b^5*c^2 - 2*a^3*b^4*c \\ & *d + a^4*b^3*d^2)*g^4*x + (a^3*b^4*c^2 - 2*a^4*b^3*c*d + a^5*b^2*d^2)*g^4) \end{aligned}$$



$$\begin{aligned}
& b^2cd^2 - a^3bd^3) * x) * \log(bx + a) * \log(dx + c)) * n^2 / (a^3b^5c^3g^4 \\
& - 3a^4b^4c^2d^2g^4 + 3a^5b^3c^2d^2g^4 - a^6b^2d^3g^4 + (b^8c^3g^4 \\
& - 3a^4b^7c^2d^2g^4 + 3a^2b^6c^2d^2g^4 - a^3b^5d^3g^4) * x^3 + 3(a^7c^3g^4 - 3a^2b^6c^2d^2g^4 + 3a^3b^5c^2d^2g^4 - a^4b^4d^3g^4) * x \\
& ^2 + 3(a^2b^6c^3g^4 - 3a^3b^5c^2d^2g^4 + 3a^4b^4c^2d^2g^4 - a^5b^3d^3g^4) * x) * B^2cd^2i^2 - 1/54 * (6n * ((11a^2b^2c^2 - 7a^3b^2cd + 2a^4d^2 \\
& + 6(3b^4c^2 - 3a^2b^3cd + a^2b^2d^2) * x^2 + 3(9a^2b^3c^2 - 7a^2b^2cd + 2a^3b^2d^2) * x) / ((b^8c^2 - 2ab^7cd + a^2b^6d^2) * g^4 * x^3 \\
& + 3(a^2b^7c^2 - 2a^2b^6cd + a^3b^5d^2) * g^4 * x^2 + 3(a^2b^6c^2 - 2a^3b^5cd + a^4b^4d^2) * g^4 * x + (a^3b^5c^2 - 2a^4b^4cd + a^5b^3d^2) * g^4) \\
& + 6(3b^2c^2d - 3ab^2cd^2 + a^2d^3) * \log(bx + a) / ((b^6c^3 - 3a^2b^5c^2d + 3a^2b^4cd^2 - a^3b^3d^3) * g^4) - 6(3b^2c^2d - 3ab^2cd^2 + a^2d^3) * \log(dx + c) / ((b^6c^3 - 3a^2b^5c^2d + 3a^2b^4cd^2 - a^3b^3d^3) * g^4) * \log(e * (bx / (dx + c) + a / (dx + c))^n) + (85a^2 \\
& * b^3c^3 - 108a^3b^2c^2d + 27a^4b^2cd^2 - 4a^5d^3 + 6(18b^5c^3 - 27ab^4c^2d + 11a^2b^3cd^2 - 2a^3b^2d^3) * x^2 - 18(3a^3b^2c^2d - 3a^4b^2cd^2 + a^5d^3 + (3b^5c^2d - 3ab^4cd^2 + a^2b^3d^3) * x^3 \\
& + 3(3ab^4c^2d - 3a^2b^3cd^2 + a^3b^2d^3) * x^2 + 3(3a^2b^3c^2d - 3a^3b^2cd^2 + a^4b^2d^3) * x) * \log(bx + a)^2 - 18(3a^3b^2c^2d - 3a^4b^2cd^2 + a^5d^3 + (3b^5c^2d - 3ab^4cd^2 + a^2b^3d^3) * x^3 \\
& + 3(3ab^4c^2d - 3a^2b^3cd^2 + a^3b^2d^3) * x^2 + 3(3a^2b^3c^2d - 3a^3b^2cd^2 + a^4b^2d^3) * x) * \log(dx + c)^2 + 3(63a^2b^4c^3 - 86a^2b^3c^2d + 27a^3b^2c^2d^2 - 4a^4b^2d^3) * x + 6(18a^3b^2c^2d - 9a^4b^2cd^2 + 2a^5d^3 + (18b^5c^2d - 9ab^4cd^2 + 2a^2b^3d^3) * x^3 \\
& + 3(18ab^4c^2d - 9a^2b^3cd^2 + 2a^3b^2d^3) * x^2 + 3(18a^2b^3c^2d - 9a^3b^2cd^2 + 2a^4b^2d^3) * x) * \log(bx + a) - 6(18a^3b^2c^2d - 9a^4b^2cd^2 + 2a^5d^3 + (18b^5c^2d - 9ab^4cd^2 + 2a^2b^3d^3) * x^3 \\
& + 3(18ab^4c^2d - 9a^2b^3cd^2 + a^3b^2d^3) * x^2 + 3(18a^2b^3c^2d - 9a^3b^2cd^2 + a^4b^2d^3) * x) * \log(bx + a) * \log(dx + c)) * n^2 / (a^3b^6c^3g^4 - 3a^4b^5c^2d^2g^4 + 3a^5b^4c^2d^2g^4 - a^6b^3d^3g^4 + (b^9c^3g^4 - 3a^4b^8c^2d^2g^4 + 3a^2b^7c^2d^2g^4 - a^3b^6d^3g^4) * x^3 \\
& + 3(a^7c^3g^4 - 3a^2b^6c^2d^2g^4 + 3a^3b^5c^2d^2g^4 - a^4b^4d^3g^4) * x^2 + 3(a^2b^7c^3g^4 - 3a^3b^6c^2d^2g^4 + 3a^4b^5c^2d^2g^4 - a^5b^4d^3g^4) * x) * B^2d^2i^2 - 2/3 * (3bx + a) * A * B * c * d^2 * i^2 * \log(e * (bx / (dx + c) + a / (dx + c))^n) / (b^5g^4 * x^3 + 3a^2b^4g^4 * x^2 + 3a^2b^3g^4 * x + a^3b^2g^4) - 2/3 * (3b^2 * x^2 + 3a * bx + a^2) * A * B * d^2 * i^2 * \log(e * (bx / (dx + c) + a / (dx + c))^n) / (b^6g^4 * x^3 + 3a^2b^5g^4 * x^2 + 3a^2b^4g^4 * x + a^3b^3g^4) - 1/3 * B^2 * c^2 * i^2 * \log(e * (bx / (dx + c) + a / (dx + c))^n)^2 / (b^4g^4 * x^3 + 3a^2b^3g^4 * x^2 + 3a^2b^2g^4 * x + a^3b * g^4) - 1/3 * (3 * bx + a) * A^2 * c * d * i^2 / (b^5g^4 * x^3 + 3a^2b^4g^4 * x^2 + 3a^2b^3g^4 * x + a^3b^2g^4) - 1/3 * (3 * b^2 * x^2 + 3a * bx + a^2) * A^2 * d^2 * i^2 / (b^6g^4 * x^3 + 3a^2b^5g^4 * x^2 + 3a^2b^4g^4 * x + a^3b^3g^4) - 2/3 * A * B * c^2 * i^2 * \log(e * (bx /
\end{aligned}$$

$$\frac{(dx + c) + a/(dx + c))^n}{(b^4g^4x^3 + 3ab^3g^4x^2 + 3a^2b^2g^4x + a^3bg^4) - 1/3A^2c^2i^2/(b^4g^4x^3 + 3ab^3g^4x^2 + 3a^2b^2g^4x + a^3bg^4)}$$

**Fricas [B]** time = 0.599645, size = 1890, normalized size = 12.04

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x,
algorithm="fricas")
```

```
[Out] -1/27*(2*(B^2*b^3*c^3 - B^2*a^3*d^3)*i^2*n^2 + 6*(A*B*b^3*c^3 - A*B*a^3*d^3)
)*i^2*n + 9*(A^2*b^3*c^3 - A^2*a^3*d^3)*i^2 + 3*(2*(B^2*b^3*c*d^2 - B^2*a*b
^2*d^3)*i^2*n^2 + 6*(A*B*b^3*c*d^2 - A*B*a*b^2*d^3)*i^2*n + 9*(A^2*b^3*c*d^
2 - A^2*a*b^2*d^3)*i^2)*x^2 + 9*(3*(B^2*b^3*c*d^2 - B^2*a*b^2*d^3)*i^2*x^2
+ 3*(B^2*b^3*c^2*d - B^2*a^2*b*d^3)*i^2*x + (B^2*b^3*c^3 - B^2*a^3*d^3)*i^2
)*log(e)^2 + 9*(B^2*b^3*d^3*i^2*n^2*x^3 + 3*B^2*b^3*c*d^2*i^2*n^2*x^2 + 3*B
^2*b^3*c^2*d*i^2*n^2*x + B^2*b^3*c^3*i^2*n^2)*log((b*x + a)/(d*x + c))^2 +
3*(2*(B^2*b^3*c^2*d - B^2*a^2*b*d^3)*i^2*n^2 + 6*(A*B*b^3*c^2*d - A*B*a^2*b
*d^3)*i^2*n + 9*(A^2*b^3*c^2*d - A^2*a^2*b*d^3)*i^2)*x + 6*((B^2*b^3*c^3 -
B^2*a^3*d^3)*i^2*n + 3*(A*B*b^3*c^3 - A*B*a^3*d^3)*i^2 + 3*((B^2*b^3*c*d^2
- B^2*a*b^2*d^3)*i^2*n + 3*(A*B*b^3*c*d^2 - A*B*a*b^2*d^3)*i^2)*x^2 + 3*((B
^2*b^3*c^2*d - B^2*a^2*b*d^3)*i^2*n + 3*(A*B*b^3*c^2*d - A*B*a^2*b*d^3)*i^2
)*x + 3*(B^2*b^3*d^3*i^2*n*x^3 + 3*B^2*b^3*c*d^2*i^2*n*x^2 + 3*B^2*b^3*c^2
*d*i^2*n*x + B^2*b^3*c^3*i^2*n)*log((b*x + a)/(d*x + c))*log(e) + 6*(B^2*b^
3*c^3*i^2*n^2 + 3*A*B*b^3*c^3*i^2*n + (B^2*b^3*d^3*i^2*n^2 + 3*A*B*b^3*d^3*
i^2*n)*x^3 + 3*(B^2*b^3*c*d^2*i^2*n^2 + 3*A*B*b^3*c*d^2*i^2*n)*x^2 + 3*(B^2
*b^3*c^2*d*i^2*n^2 + 3*A*B*b^3*c^2*d*i^2*n)*x)*log((b*x + a)/(d*x + c)))/((
b^7*c - a*b^6*d)*g^4*x^3 + 3*(a*b^6*c - a^2*b^5*d)*g^4*x^2 + 3*(a^2*b^5*c -
a^3*b^4*d)*g^4*x + (a^3*b^4*c - a^4*b^3*d)*g^4)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**4, x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2 \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2}{(bgx + ag)^4} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4, x, algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(b*g*x + a*g)^4, x)
```



$$3.176 \quad \int \frac{(ci+dx)^2 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ag+bgx)^5} dx$$

**Optimal.** Leaf size=319

$$\frac{bi^2(c+dx)^4 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)^2}{4g^5(a+bx)^4(bc-ad)^2} - \frac{bBi^2n(c+dx)^4 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{8g^5(a+bx)^4(bc-ad)^2} + \frac{di^2(c+dx)^3 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{3g^5(a+bx)^3(bc-ad)^2}$$

[Out]  $(2*B^2*d*i^2*n^2*(c+d*x)^3)/(27*(b*c-a*d)^2*g^5*(a+b*x)^3) - (b*B^2*i^2*n^2*(c+d*x)^4)/(32*(b*c-a*d)^2*g^5*(a+b*x)^4) + (2*B*d*i^2*n*(c+d*x)^3*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(9*(b*c-a*d)^2*g^5*(a+b*x)^3) - (b*B*i^2*n*(c+d*x)^4*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(8*(b*c-a*d)^2*g^5*(a+b*x)^4) + (d*i^2*(c+d*x)^3*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))^2/(3*(b*c-a*d)^2*g^5*(a+b*x)^3) - (b*i^2*(c+d*x)^4*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))^2/(4*(b*c-a*d)^2*g^5*(a+b*x)^4)$

**Rubi [C]** time = 3.78887, antiderivative size = 989, normalized size of antiderivative = 3.1, number of steps used = 98, number of rules used = 11, integrand size = 45,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.244$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2i^2n^2 \log^2(a+bx)d^4}{12b^3(bc-ad)^2g^5} - \frac{B^2i^2n^2 \log^2(c+dx)d^4}{12b^3(bc-ad)^2g^5} + \frac{7B^2i^2n^2 \log(a+bx)d^4}{72b^3(bc-ad)^2g^5} + \frac{Bi^2n \log(a+bx) \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) d^4}{6b^3(bc-ad)^2g^5}$$

Antiderivative was successfully verified.

[In] Int[((c\*i + d\*i\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(a\*g + b\*g\*x)^5,x]

[Out]  $-(B^2*(b*c-a*d)^2*i^2*n^2)/(32*b^3*g^5*(a+b*x)^4) - (11*B^2*d*(b*c-a*d)*i^2*n^2)/(216*b^3*g^5*(a+b*x)^3) + (5*B^2*d^2*i^2*n^2)/(144*b^3*g^5*(a+b*x)^2) + (7*B^2*d^3*i^2*n^2)/(72*b^3*(b*c-a*d)*g^5*(a+b*x)) + (7*B^2*d^4*i^2*n^2*Log[a+b*x])/(72*b^3*(b*c-a*d)^2*g^5) - (B^2*d^4*i^2*n^2*Log[a+b*x]^2)/(12*b^3*(b*c-a*d)^2*g^5) - (B*(b*c-a*d)^2*i^2*n*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(8*b^3*g^5*(a+b*x)^4) - (5*B*d*(b*c-a*d)*i^2*n*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(18*b^3*g^5*(a+b*x)^3) - (B*d^2*i^2*n*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(12*b^3*g^5*(a+b*x)^2) + (B*d^3*i^2*n*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(6*b^3*(b*c-a*d)*g^5*(a+b*x)) + (B*d^4*i^2*n*Log[a+b*x]*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(6*b^3*(b*c-a*d)*g^5*(a+b*x))$

$$\begin{aligned} & \dots) \wedge n) \wedge n) / (6 * b^3 * (b * c - a * d)^2 * g^5) - ((b * c - a * d)^2 * i^2 * (A + B * \text{Log}[e * ((a + \\ & b * x) / (c + d * x))^n])^2) / (4 * b^3 * g^5 * (a + b * x)^4) - (2 * d * (b * c - a * d) * i^2 * (A + \\ & B * \text{Log}[e * ((a + b * x) / (c + d * x))^n])^2) / (3 * b^3 * g^5 * (a + b * x)^3) - (d^2 * i^2 * (A \\ & + B * \text{Log}[e * ((a + b * x) / (c + d * x))^n])^2) / (2 * b^3 * g^5 * (a + b * x)^2) - (7 * B^2 * d^4 \\ & * i^2 * n^2 * \text{Log}[c + d * x]) / (72 * b^3 * (b * c - a * d)^2 * g^5) + (B^2 * d^4 * i^2 * n^2 * \text{Log}[- \\ & ((d * (a + b * x)) / (b * c - a * d))] * \text{Log}[c + d * x]) / (6 * b^3 * (b * c - a * d)^2 * g^5) - (B * d \\ & ^4 * i^2 * n * (A + B * \text{Log}[e * ((a + b * x) / (c + d * x))^n]) * \text{Log}[c + d * x]) / (6 * b^3 * (b * c - \\ & a * d)^2 * g^5) - (B^2 * d^4 * i^2 * n^2 * \text{Log}[c + d * x]^2) / (12 * b^3 * (b * c - a * d)^2 * g^5) \\ & + (B^2 * d^4 * i^2 * n^2 * \text{Log}[a + b * x] * \text{Log}[(b * (c + d * x)) / (b * c - a * d)]) / (6 * b^3 * (b * c \\ & - a * d)^2 * g^5) + (B^2 * d^4 * i^2 * n^2 * \text{PolyLog}[2, -((d * (a + b * x)) / (b * c - a * d))]) \\ & / (6 * b^3 * (b * c - a * d)^2 * g^5) + (B^2 * d^4 * i^2 * n^2 * \text{PolyLog}[2, (b * (c + d * x)) / (b * c \\ & - a * d)]) / (6 * b^3 * (b * c - a * d)^2 * g^5) \end{aligned}$$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
```

, Int[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x] /;  
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

### Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*(RFx\_), x\_Symbol] :> With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]

### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.)\*(x\_))^(q\_.), x\_Symbol] :> Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] :> Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :> Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n]))/g, x] - Dist[(b\*e^n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))])\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :> Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] :> -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rubi steps

$$\begin{aligned}
\int \frac{(176c + 176dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ag + bgx)^5} dx &= \int \left( \frac{30976(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2 g^5 (a + bx)^5} + \frac{61952d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^2 g^5 (a + bx)^4} \right) dx \\
&= \frac{(30976d^2) \int \frac{\left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(a+bx)^3} dx}{b^2 g^5} + \frac{(61952d(bc - ad)) \int \frac{\left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(a+bx)^4} dx}{b^2 g^5} \\
&= -\frac{7744(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3 g^5 (a + bx)^4} - \frac{61952d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3b^3 g^5 (a + bx)^4} \\
&= -\frac{7744(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3 g^5 (a + bx)^4} - \frac{61952d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3b^3 g^5 (a + bx)^4} \\
&= -\frac{7744(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3 g^5 (a + bx)^4} - \frac{61952d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3b^3 g^5 (a + bx)^4} \\
&= -\frac{7744(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3 g^5 (a + bx)^4} - \frac{61952d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3b^3 g^5 (a + bx)^4} \\
&= -\frac{3872B(bc - ad)^2 n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3 g^5 (a + bx)^4} - \frac{77440Bd(bc - ad) n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{9b^3 g^5 (a + bx)^4} \\
&= -\frac{3872B(bc - ad)^2 n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3 g^5 (a + bx)^4} - \frac{77440Bd(bc - ad) n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{9b^3 g^5 (a + bx)^4} \\
&= -\frac{3872B(bc - ad)^2 n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3 g^5 (a + bx)^4} - \frac{77440Bd(bc - ad) n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{9b^3 g^5 (a + bx)^4} \\
&= -\frac{968B^2(bc - ad)^2 n^2}{b^3 g^5 (a + bx)^4} - \frac{42592B^2 d(bc - ad) n^2}{27b^3 g^5 (a + bx)^3} + \frac{9680B^2 d^2 n^2}{9b^3 g^5 (a + bx)^2} + \frac{9680B^2 d^2 n^2}{9b^3 g^5 (a + bx)^2} \\
&= -\frac{968B^2(bc - ad)^2 n^2}{b^3 g^5 (a + bx)^4} - \frac{42592B^2 d(bc - ad) n^2}{27b^3 g^5 (a + bx)^3} + \frac{9680B^2 d^2 n^2}{9b^3 g^5 (a + bx)^2} + \frac{9680B^2 d^2 n^2}{9b^3 g^5 (a + bx)^2} \\
&= -\frac{968B^2(bc - ad)^2 n^2}{b^3 g^5 (a + bx)^4} - \frac{42592B^2 d(bc - ad) n^2}{27b^3 g^5 (a + bx)^3} + \frac{9680B^2 d^2 n^2}{9b^3 g^5 (a + bx)^2} + \frac{9680B^2 d^2 n^2}{9b^3 g^5 (a + bx)^2}
\end{aligned}$$

**Mathematica [C]** time = 3.14642, size = 1860, normalized size = 5.83

result too large to display

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(a\*g + b\*g\*x)^5,x]

[Out] 
$$-(i^2*(216*(b*c - a*d)^4*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2 - 576*d*(-(b*c) + a*d)^3*(a + b*x)*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2 + 432*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2 + 216*B*d^2*n*(a + b*x)^2*(2*(b*c - a*d)^2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]) + 4*d*(-(b*c) + a*d)*(a + b*x)*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]) - 4*d^2*(a + b*x)^2*\text{Log}[a + b*x]*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]) + 4*d^2*(a + b*x)^2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])* \text{Log}[c + d*x] - 4*B*d*n*(a + b*x)*(b*c - a*d + d*(a + b*x)*\text{Log}[a + b*x] - d*(a + b*x)*\text{Log}[c + d*x]) + B*n*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*\text{Log}[a + b*x] + 2*d^2*(a + b*x)^2*\text{Log}[c + d*x]) + 2*B*d^2*n*(a + b*x)^2*(\text{Log}[a + b*x]*(\text{Log}[a + b*x] - 2*\text{Log}[(b*(c + d*x))/(b*c - a*d)]) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 2*B*d^2*n*(a + b*x)^2*((2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] - \text{Log}[c + d*x])* \text{Log}[c + d*x] + 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]) + 32*B*d*n*(a + b*x)*(12*(b*c - a*d)^3*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]) - 18*d*(b*c - a*d)^2*(a + b*x)*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]) + 36*d^2*(b*c - a*d)*(a + b*x)^2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]) + 36*d^3*(a + b*x)^3*\text{Log}[a + b*x]*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]) - 36*d^3*(a + b*x)^3*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])* \text{Log}[c + d*x] + 36*B*d^2*n*(a + b*x)^2*(b*c - a*d + d*(a + b*x)*\text{Log}[a + b*x] - d*(a + b*x)*\text{Log}[c + d*x]) - 9*B*d*n*(a + b*x)*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*\text{Log}[a + b*x] + 2*d^2*(a + b*x)^2*\text{Log}[c + d*x]) + 2*B*n*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*\text{Log}[a + b*x] - 6*d^3*(a + b*x)^3*\text{Log}[c + d*x]) - 18*B*d^3*n*(a + b*x)^3*(\text{Log}[a + b*x]*(\text{Log}[a + b*x] - 2*\text{Log}[(b*(c + d*x))/(b*c - a*d)]) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 18*B*d^3*n*(a + b*x)^3*((2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] - \text{Log}[c + d*x])* \text{Log}[c + d*x] + 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]) + 3*B*n*(36*(b*c - a*d)^4*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]) + 48*d*(-(b*c) + a*d)^3*(a + b*x)*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]) + 72*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]) + 144*d^3*(-(b*c) + a*d)*(a + b*x)^3*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]) - 144*d^4*(a + b*x)^4*\text{Log}[a + b*x]*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]) + 144*d^4*(a + b*x)^4*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])* \text{Log}[c + d*x] - 144*B*d^3*n*(a + b*x)^3*(b*c - a*d + d*(a + b*x)*\text{Log}[a + b*x] - d*(a + b*x)*\text{Log}[c + d*x]) + 36*B*d^2*n*(a + b*x)^2*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*\text{Lo$$

$$g[a + b*x] + 2*d^2*(a + b*x)^2*\text{Log}[c + d*x]) - 8*B*d^n*(a + b*x)*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*\text{Log}[a + b*x] - 6*d^3*(a + b*x)^3*\text{Log}[c + d*x]) + 3*B*n*(3*(b*c - a*d)^4 + 4*d*(-(b*c) + a*d)^3*(a + b*x) + 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 12*d^3*(-(b*c) + a*d)*(a + b*x)^3 - 12*d^4*(a + b*x)^4*\text{Log}[a + b*x] + 12*d^4*(a + b*x)^4*\text{Log}[c + d*x]) + 72*B*d^4*n*(a + b*x)^4*(\text{Log}[a + b*x]*(\text{Log}[a + b*x] - 2*\text{Log}[(b*(c + d*x))/(b*c - a*d)]) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 72*B*d^4*n*(a + b*x)^4*((2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] - \text{Log}[c + d*x])*\text{Log}[c + d*x] + 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])))/((864*b^3*(b*c - a*d)^2*g^5*(a + b*x)^4)$$

**Maple [F]** time = 0.703, size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2}{(bgx + ag)^5} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*i\*x+c\*i)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^5,x)

[Out] int((d\*i\*x+c\*i)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^5,x)

**Maxima [B]** time = 4.47387, size = 10917, normalized size = 34.22

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^5,x, algorithm="maxima")

[Out] 
$$\frac{1}{24}A*B*c^2*i^2*n*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 25*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2 + 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g^5) + 12*d^4*\text{log}(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c$$

$$\begin{aligned}
& ^2d^2 - 4a^3b^2c^2d^3 + a^4b^2d^4)g^5) - 12d^4\log(dx + c)/((b^5c^4 \\
& - 4a^3b^4c^3d + 6a^2b^3c^2d^2 - 4a^3b^2c^2d^3 + a^4b^2d^4)g^5) - \\
& 1/72ABd^2i^2n*((13a^2b^3c^3 - 75a^3b^2c^2d + 33a^4b^2c^2d^2 - 7 \\
& a^5d^3 - 12(6b^5c^2d - 4a^3b^4c^2d^2 + a^2b^3d^3)*x^3 + 6(6b^5c^ \\
& 3 - 46a^3b^4c^2d + 29a^2b^3c^2d^2 - 7a^3b^2d^3)*x^2 + 4(10a^3b^4c^ \\
& 3 - 63a^2b^3c^2d + 33a^3b^2c^2d^2 - 7a^4b^2d^3)*x)/((b^10c^3 - 3a^ \\
& b^9c^2d + 3a^2b^8c^2d^2 - a^3b^7d^3)g^5x^4 + 4(a^3b^9c^3 - 3a^2b^ \\
& ^8c^2d + 3a^3b^7c^2d^2 - a^4b^6d^3)g^5x^3 + 6(a^2b^8c^3 - 3a^3b^ \\
& ^7c^2d + 3a^4b^6c^2d^2 - a^5b^5d^3)g^5x^2 + 4(a^3b^7c^3 - 3a^4 \\
& ^6c^2d + 3a^5b^5c^2d^2 - a^6b^4d^3)g^5x + (a^4b^6c^3 - 3a^5b^ \\
& 5c^2d + 3a^6b^4c^2d^2 - a^7b^3d^3)g^5) - 12(6b^2c^2d^2 - 4a^3b^2c^ \\
& ^2d^3 + a^2d^4)*\log(bx + a)/((b^7c^4 - 4a^3b^6c^3d + 6a^2b^5c^2d^2 \\
& - 4a^3b^4c^2d^3 + a^4b^3d^4)g^5) + 12(6b^2c^2d^2 - 4a^3b^2c^2d^3 + a \\
& ^2d^4)*\log(dx + c)/((b^7c^4 - 4a^3b^6c^3d + 6a^2b^5c^2d^2 - 4a^3b^ \\
& ^4c^2d^3 + a^4b^3d^4)g^5) - 1/36ABCd^2i^2n*((7a^3b^3c^3 - 33a^2b^ \\
& ^2c^2d + 75a^3b^2c^2d^2 - 13a^4d^3 + 12(4b^4c^2d^2 - a^3b^3d^3)*x^3 \\
& - 6(4b^4c^2d^2 - 29a^3b^3c^2d^2 + 7a^2b^2d^3)*x^2 + 4(4b^4c^3 - 21a \\
& ^3b^3c^2d + 57a^2b^2c^2d^2 - 13a^3b^2d^3)*x)/((b^9c^3 - 3a^3b^8c^2d \\
& + 3a^2b^7c^2d^2 - a^3b^6d^3)g^5x^4 + 4(a^3b^8c^3 - 3a^2b^7c^2d \\
& + 3a^3b^6c^2d^2 - a^4b^5d^3)g^5x^3 + 6(a^2b^7c^3 - 3a^3b^6c^2d \\
& + 3a^4b^5c^2d^2 - a^5b^4d^3)g^5x^2 + 4(a^3b^6c^3 - 3a^4b^5c^2d \\
& d + 3a^5b^4c^2d^2 - a^6b^3d^3)g^5x + (a^4b^5c^3 - 3a^5b^4c^2d + \\
& 3a^6b^3c^2d^2 - a^7b^2d^3)g^5) + 12(4b^2c^2d^2 - a^3b^2d^3)*\log(bx + a)/ \\
& ((b^6c^4 - 4a^3b^5c^3d + 6a^2b^4c^2d^2 - 4a^3b^3c^2d^3 + a^4b^2d^ \\
& ^4)g^5) - 12(4b^2c^2d^2 - a^3b^2d^3)*\log(dx + c)/((b^6c^4 - 4a^3b^5c^3d + \\
& 6a^2b^4c^2d^2 - 4a^3b^3c^2d^3 + a^4b^2d^4)g^5) - 1/6(4bx + a)* \\
& B^2c^2d^2i^2*\log(e*(bx/(dx + c) + a/(dx + c))^n)^2/(b^6g^5x^4 + 4a^3b^5 \\
& ^5x^3 + 6a^2b^4g^5x^2 + 4a^3b^3g^5x + a^4b^2g^5) - 1/12(6b^2 \\
& ^2x^2 + 4a^3bx + a^2)*B^2d^2i^2*\log(e*(bx/(dx + c) + a/(dx + c))^n)^2/ \\
& (b^7g^5x^4 + 4a^3b^6g^5x^3 + 6a^2b^5g^5x^2 + 4a^3b^4g^5x + a^4b^3 \\
& ^3g^5) + 1/288(12n*((12b^3d^3x^3 - 3b^3c^3 + 13a^3b^2c^2d - 23a \\
& ^2b^2c^2d^2 + 25a^3d^3 - 6(b^3c^2d^2 - 7a^3b^2d^3)*x^2 + 4(b^3c^2d - \\
& 5a^3b^2c^2d^2 + 13a^2b^2d^3)*x)/((b^8c^3 - 3a^3b^7c^2d + 3a^2b^6c^2d \\
& ^2 - a^3b^5d^3)g^5x^4 + 4(a^3b^7c^3 - 3a^2b^6c^2d + 3a^3b^5c^2d^2 \\
& - a^4b^4d^3)g^5x^3 + 6(a^2b^6c^3 - 3a^3b^5c^2d + 3a^4b^4c^2d^2 \\
& - a^5b^3d^3)g^5x^2 + 4(a^3b^5c^3 - 3a^4b^4c^2d + 3a^5b^3c^2d^2 \\
& ^2 - a^6b^2d^3)g^5x + (a^4b^4c^3 - 3a^5b^3c^2d + 3a^6b^2c^2d^2 \\
& - a^7b^2d^3)g^5) + 12d^4*\log(bx + a)/((b^5c^4 - 4a^3b^4c^3d + 6a^2b^ \\
& ^3c^2d^2 - 4a^3b^2c^2d^3 + a^4b^2d^4)g^5) - 12d^4*\log(dx + c)/((b^5c^ \\
& ^4 - 4a^3b^4c^3d + 6a^2b^3c^2d^2 - 4a^3b^2c^2d^3 + a^4b^2d^4)g^5) \\
& )*\log(e*(bx/(dx + c) + a/(dx + c))^n) - (9b^4c^4 - 64a^3b^3c^3d + 21 \\
& 6a^2b^2c^2d^2 - 576a^3b^2c^2d^3 + 415a^4d^4 - 300(b^4c^2d^3 - a^3b^3 \\
& ^3d^4)*x^3 + 6(13b^4c^2d^2 - 176a^3b^3c^2d^3 + 163a^2b^2d^4)*x^2 + 72 \\
& (b^4d^4x^4 + 4a^3b^3d^4x^3 + 6a^2b^2d^4x^2 + 4a^3b^2d^4x + a^4d^ \\
& 4)*\log(bx + a)^2 + 72(b^4d^4x^4 + 4a^3b^3d^4x^3 + 6a^2b^2d^4x^2 +
\end{aligned}$$

$$\begin{aligned}
& 4a^3b^4d^4x + a^4d^4) \log(dx + c)^2 - 4*(7b^4c^3d - 60a^3b^3c^2d^2 + 324a^2b^2c^2d^3 - 271a^3b^4d^4)x - 300*(b^4d^4x^4 + 4a^3b^3d^4x^3 + 6a^2b^2d^4x^2 + 4a^3b^4d^4x + a^4d^4) \log(bx + a) + 12*(25b^4d^4x^4 + 100a^3b^3d^4x^3 + 150a^2b^2d^4x^2 + 100a^3b^4d^4x + 25a^4d^4 - 12*(b^4d^4x^4 + 4a^3b^3d^4x^3 + 6a^2b^2d^4x^2 + 4a^3b^4d^4x + a^4d^4) \log(bx + a)) \log(dx + c) * n^2 / (a^4b^5c^4g^5 - 4a^5b^4c^3d^2g^5 + 6a^6b^3c^2d^2g^5 - 4a^7b^2c^2d^2g^5 + a^8b^4d^4g^5 + (b^9c^4g^5 - 4a^3b^8c^3d^2g^5 + 6a^2b^7c^2d^2g^5 - 4a^3b^6c^2d^3g^5 + a^4b^5d^4g^5) * x^4 + 4*(a^3b^8c^4g^5 - 4a^2b^7c^3d^2g^5 + 6a^3b^6c^2d^2g^5 - 4a^4b^5c^2d^3g^5 + a^5b^4d^4g^5) * x^3 + 6*(a^2b^7c^4g^5 - 4a^3b^6c^3d^2g^5 + 6a^4b^5c^2d^2g^5 - 4a^5b^4c^2d^3g^5 + a^6b^3d^4g^5) * x^2 + 4*(a^3b^6c^4g^5 - 4a^4b^5c^3d^2g^5 + 6a^5b^4c^2d^2g^5 - 4a^6b^3c^2d^3g^5 + a^7b^2d^4g^5) * x) * B^2c^2i^2 - 1/432*(12*n*((7a^3b^3c^3 - 33a^2b^2c^2d + 75a^3b^4c^2d^2 - 13a^4d^3 + 12*(4b^4c^2d^2 - a^3b^3d^3) * x^3 - 6*(4b^4c^2d - 29a^3b^3c^2d^2 + 7a^2b^2d^3) * x^2 + 4*(4b^4c^3 - 21a^3b^3c^2d + 57a^2b^2c^2d^2 - 13a^3b^4d^3) * x) / ((b^9c^3 - 3a^3b^8c^2d + 3a^2b^7c^2d^2 - a^3b^6d^3) * g^5 * x^4 + 4*(a^3b^8c^3 - 3a^2b^7c^2d + 3a^3b^6c^2d^2 - a^4b^5d^3) * g^5 * x^3 + 6*(a^2b^7c^3 - 3a^3b^6c^2d + 3a^4b^5c^2d^2 - a^5b^4d^3) * g^5 * x^2 + 4*(a^3b^6c^3 - 3a^4b^5c^2d + 3a^5b^4c^2d^2 - a^6b^3d^3) * g^5 * x + (a^4b^5c^3 - 3a^5b^4c^2d + 3a^6b^3c^2d^2 - a^7b^2d^3) * g^5) + 12*(4b^3c^2d^3 - a^4d^4) * \log(bx + a) / ((b^6c^4 - 4a^3b^5c^3d + 6a^2b^4c^2d^2 - 4a^3b^3c^2d^3 + a^4b^2d^4) * g^5) * \log(e*(bx/(dx + c) + a/(dx + c))^n) + (37a^4b^4c^4 - 304a^2b^3c^3d + 1512a^3b^2c^2d^2 - 1360a^4b^3c^2d^3 + 115a^5d^4 + 12*(88b^5c^2d^2 - 101a^3b^4c^2d^3 + 13a^2b^3d^4) * x^3 - 6*(40b^5c^3d - 609a^3b^4c^2d^2 + 648a^2b^3c^2d^3 - 79a^3b^2d^4) * x^2 - 72*(4a^4b^3c^2d^3 - a^5d^4 + (4b^5c^2d^3 - a^4b^4d^4) * x^4 + 4*(4a^3b^4c^2d^3 - a^2b^3d^4) * x^3 + 6*(4a^2b^3c^2d^3 - a^3b^2d^4) * x^2 + 4*(4a^3b^2c^2d^3 - a^4b^3d^4) * x) * \log(bx + a)^2 - 72*(4a^4b^3c^2d^3 - a^5d^4 + (4b^5c^2d^3 - a^4b^4d^4) * x^4 + 4*(4a^3b^4c^2d^3 - a^2b^3d^4) * x^3 + 6*(4a^2b^3c^2d^3 - a^3b^2d^4) * x^2 + 4*(4a^3b^2c^2d^3 - a^4b^3d^4) * x) * \log(dx + c)^2 + 4*(16b^5c^4 - 163a^3b^4c^3d + 1068a^2b^3c^2d^2 - 1036a^3b^2c^2d^3 + 115a^4b^4d^4) * x + 12*(88a^4b^3c^2d^3 - 13a^5d^4 + (88b^5c^2d^3 - 13a^3b^4d^4) * x^4 + 4*(88a^3b^4c^2d^3 - 13a^2b^3d^4) * x^3 + 6*(88a^2b^3c^2d^3 - 13a^3b^2d^4) * x^2 + 4*(88a^3b^2c^2d^3 - 13a^4b^3d^4) * x) * \log(bx + a) - 12*(88a^4b^3c^2d^3 - 13a^5d^4 + (88b^5c^2d^3 - 13a^3b^4d^4) * x^4 + 4*(88a^3b^4c^2d^3 - 13a^2b^3d^4) * x^3 + 6*(88a^2b^3c^2d^3 - 13a^3b^2d^4) * x^2 + 4*(88a^3b^2c^2d^3 - 13a^4b^3d^4) * x - 12*(4a^4b^3c^2d^3 - a^5d^4 + (4b^5c^2d^3 - a^4b^4d^4) * x^4 + 4*(4a^3b^4c^2d^3 - a^2b^3d^4) * x^3 + 6*(4a^2b^3c^2d^3 - a^3b^2d^4) * x^2 + 4*(4a^3b^2c^2d^3 - a^4b^3d^4) * x) * \log(bx + a)) * \log(dx + c) * n^2 / (a^4b^6c^4g^5 - 4a^5b^5c^3d^2g^5 + 6a^6b^4c^2d^2g^5 - 4a^7b^3c^2d^3g^5 + a^8b^2d^4g^5 + (b^10c^4g^5 - 4a^3b^9c^3d^2g^5 + 6a^2b^8c^2d^2g^5 - 4a^3b^7c^2d^3g^5 + a^4
\end{aligned}$$



$$\begin{aligned}
& *b^6*d^4*g^5)*x^4 + 4*(a*b^9*c^4*g^5 - 4*a^2*b^8*c^3*d*g^5 + 6*a^3*b^7*c^2*d^2*g^5 - 4*a^4*b^6*c*d^3*g^5 + a^5*b^5*d^4*g^5)*x^3 + 6*(a^2*b^8*c^4*g^5 - \\
& 4*a^3*b^7*c^3*d*g^5 + 6*a^4*b^6*c^2*d^2*g^5 - 4*a^5*b^5*c*d^3*g^5 + a^6*b^4*d^4*g^5)*x^2 + 4*(a^3*b^7*c^4*g^5 - 4*a^4*b^6*c^3*d*g^5 + 6*a^5*b^5*c^2*d^2*g^5 - \\
& 4*a^6*b^4*c*d^3*g^5 + a^7*b^3*d^4*g^5)*x)) * B^2*c*d*i^2 - 1/864*(12 * n*((13*a^2*b^3*c^3 - 75*a^3*b^2*c^2*d + 33*a^4*b*c*d^2 - 7*a^5*d^3 - 12*(6 * b^5*c^2*d - 4*a*b^4*c*d^2 + a^2*b^3*d^3))*x^3 + 6*(6*b^5*c^3 - 46*a*b^4*c^2 * d + 29*a^2*b^3*c*d^2 - 7*a^3*b^2*d^3))*x^2 + 4*(10*a*b^4*c^3 - 63*a^2*b^3*c^2*d + 33*a^3*b^2*c*d^2 - 7*a^4*b*d^3)*x)/((b^10*c^3 - 3*a*b^9*c^2*d + 3*a^2 * b^8*c*d^2 - a^3*b^7*d^3)*g^5*x^4 + 4*(a*b^9*c^3 - 3*a^2*b^8*c^2*d + 3*a^3 * b^7*c*d^2 - a^4*b^6*d^3)*g^5*x^3 + 6*(a^2*b^8*c^3 - 3*a^3*b^7*c^2*d + 3*a^4 * b^6*c*d^2 - a^5*b^5*d^3)*g^5*x^2 + 4*(a^3*b^7*c^3 - 3*a^4*b^6*c^2*d + 3*a^5 * b^5*c*d^2 - a^6*b^4*d^3)*g^5*x + (a^4*b^6*c^3 - 3*a^5*b^5*c^2*d + 3*a^6 * b^4*c*d^2 - a^7*b^3*d^3)*g^5) - 12*(6*b^2*c^2*d^2 - 4*a*b*c*d^3 + a^2*d^4)* \\
& \log(b*x + a)/((b^7*c^4 - 4*a*b^6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4*a^3*b^4*c*d^3 + a^4*b^3*d^4)*g^5) + 12*(6*b^2*c^2*d^2 - 4*a*b*c*d^3 + a^2*d^4)*\log(d*x \\
& + c)/((b^7*c^4 - 4*a*b^6*c^3*d + 6*a^2*b^5*c^2*d^2 - 4*a^3*b^4*c*d^3 + a^4 * b^3*d^4)*g^5))*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + (115*a^2*b^4*c^4 - \\
& 1360*a^3*b^3*c^3*d + 1512*a^4*b^2*c^2*d^2 - 304*a^5*b*c*d^3 + 37*a^6*d^4 - \\
& 12*(108*b^6*c^3*d - 148*a*b^5*c^2*d^2 + 47*a^2*b^4*c*d^3 - 7*a^3*b^3*d^4))*x^3 + 6*(36*b^6*c^4 - 712*a*b^5*c^3*d + 903*a^2*b^4*c^2*d^2 - 264*a^3*b^3*c * d^3 + 37*a^4*b^2*d^4)*x^2 + 72*(6*a^4*b^2*c^2*d^2 - 4*a^5*b*c*d^3 + a^6*d^4 \\
& + (6*b^6*c^2*d^2 - 4*a*b^5*c*d^3 + a^2*b^4*d^4))*x^4 + 4*(6*a*b^5*c^2*d^2 - \\
& 4*a^2*b^4*c*d^3 + a^3*b^3*d^4)*x^3 + 6*(6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4 * b^2*d^4)*x^2 + 4*(6*a^3*b^3*c^2*d^2 - 4*a^4*b^2*c*d^3 + a^5*b*d^4)*x * \log(b*x + a)^2 + 72*(6*a^4*b^2*c^2*d^2 - 4*a^5*b*c*d^3 + a^6*d^4 + (6*b^6 * c^2*d^2 - 4*a*b^5*c*d^3 + a^2*b^4*d^4))*x^4 + 4*(6*a*b^5*c^2*d^2 - 4*a^2*b^4 * c*d^3 + a^3*b^3*d^4)*x^3 + 6*(6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4 * b^2*d^4)*x^2 + 4*(6*a^3*b^3*c^2*d^2 - 4*a^4*b^2*c*d^3 + a^5*b*d^4)*x * \log(d * x + c)^2 + 4*(76*a*b^5*c^4 - 1057*a^2*b^4*c^3*d + 1248*a^3*b^3*c^2*d^2 - 3 \\
& 04*a^4*b^2*c*d^3 + 37*a^5*b*d^4)*x - 12*(108*a^4*b^2*c^2*d^2 - 40*a^5*b*c*d^3 + 7*a^6*d^4 + (108*b^6*c^2*d^2 - 40*a*b^5*c*d^3 + 7*a^2*b^4*d^4))*x^4 + 4 * (108*a*b^5*c^2*d^2 - 40*a^2*b^4*c*d^3 + 7*a^3*b^3*d^4)*x^3 + 6*(108*a^2*b^4 * c^2*d^2 - 40*a^3*b^3*c*d^3 + 7*a^4*b^2*d^4)*x^2 + 4*(108*a^3*b^3*c^2*d^2 - \\
& 40*a^4*b^2*c*d^3 + 7*a^5*b*d^4)*x * \log(b*x + a) + 12*(108*a^4*b^2*c^2*d^2 - \\
& 40*a^5*b*c*d^3 + 7*a^6*d^4 + (108*b^6*c^2*d^2 - 40*a*b^5*c*d^3 + 7*a^2*b^4 * d^4))*x^4 + 4*(108*a*b^5*c^2*d^2 - 40*a^2*b^4*c*d^3 + 7*a^3*b^3*d^4)*x^3 \\
& + 6*(108*a^2*b^4*c^2*d^2 - 40*a^3*b^3*c*d^3 + 7*a^4*b^2*d^4)*x^2 + 4*(108*a^3 * b^3*c^2*d^2 - 40*a^4*b^2*c*d^3 + 7*a^5*b*d^4)*x - 12*(6*a^4*b^2*c^2*d^2 - \\
& 4*a^5*b*c*d^3 + a^6*d^4 + (6*b^6*c^2*d^2 - 4*a*b^5*c*d^3 + a^2*b^4*d^4))*x^4 + 4*(6*a*b^5*c^2*d^2 - 4*a^2*b^4*c*d^3 + a^3*b^3*d^4)*x^3 + 6*(6*a^2*b^4 * c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*x^2 + 4*(6*a^3*b^3*c^2*d^2 - 4*a^4 * b^2*c*d^3 + a^5*b*d^4)*x * \log(b*x + a)) * \log(d*x + c)) * n^2 / (a^4*b^7*c^4*g^5 - 4*a^5*b^6*c^3*d*g^5 + 6*a^6*b^5*c^2*d^2*g^5 - 4*a^7*b^4*c*d^3*g^5 + a^8 * b^3*d^4*g^5 + (b^11*c^4*g^5 - 4*a*b^10*c^3*d*g^5 + 6*a^2*b^9*c^2*d^2*g^5 -
\end{aligned}$$

$$\begin{aligned}
& 4a^3b^8c^3d^3g^5 + a^4b^7d^4g^5)x^4 + 4(a^3b^10c^4g^5 - 4a^2b^9c^3d^3g^5 + a^4b^7d^4g^5) \\
& *c^3d^3g^5 + 6a^3b^8c^2d^2g^5 - 4a^4b^7c^3d^3g^5 + a^5b^6d^4g^5) \\
& *x^3 + 6(a^2b^9c^4g^5 - 4a^3b^8c^3d^3g^5 + 6a^4b^7c^2d^2g^5 - 4 \\
& *a^5b^6c^3d^3g^5 + a^6b^5d^4g^5)x^2 + 4(a^3b^8c^4g^5 - 4a^4b^7c^3d^3g^5 + 6a^5b^6c^2d^2g^5 - 4a^6b^5c^3d^3g^5 + a^7b^4d^4g^5) * \\
& x) * B^2d^2i^2 - 1/3(4bx + a) * A * B * c * d * i^2 * \log(e*(bx/(dx + c) + a/(dx + c)))^n) / (b^6g^5x^4 + 4a*b^5g^5x^3 + 6a^2b^4g^5x^2 + 4a^3b^3g^5x \\
& + a^4b^2g^5) - 1/6(6b^2x^2 + 4a*b*x + a^2) * A * B * d^2i^2 * \log(e*(bx/(dx + c) + a/(dx + c)))^n) / (b^7g^5x^4 + 4a*b^6g^5x^3 + 6a^2b^5g^5x^2 + 4a^3b^4g^5x \\
& *x^2 + 4a^3b^4g^5x + a^4b^3g^5) - 1/4B^2c^2i^2 * \log(e*(bx/(dx + c) + a/(dx + c)))^n) / (b^5g^5x^4 + 4a*b^4g^5x^3 + 6a^2b^3g^5x^2 + 4a^3b^2g^5x \\
& + a^4b^2g^5) - 1/6(4bx + a) * A^2 * c * d * i^2 / (b^6g^5x^4 + 4a*b^5g^5x^3 + 6a^2b^4g^5x^2 + 4a^3b^3g^5x + a^4b^2g^5) - 1/12 * \\
& (6b^2x^2 + 4a*b*x + a^2) * A^2 * d^2i^2 / (b^7g^5x^4 + 4a*b^6g^5x^3 + 6a^2b^5g^5x^2 + 4a^3b^4g^5x + a^4b^3g^5) - 1/2 * A * B * c^2i^2 * \log(e*(bx/(dx + c) + a/(dx + c)))^n) / (b^5g^5x^4 + 4a*b^4g^5x^3 + 6a^2b^3g^5x^2 + 4a^3b^2g^5x + a^4b^2g^5) - 1/4 * A^2 * c^2i^2 / (b^5g^5x^4 + 4a*b^4g^5x^3 + 6a^2b^3g^5x^2 + 4a^3b^2g^5x + a^4b^2g^5)
\end{aligned}$$

**Fricas [B]** time = 0.715539, size = 3484, normalized size = 10.92

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^5,x,  
algorithm="fricas")

[Out]  $-1/864 * ((27 * B^2 * b^4 * c^4 - 64 * B^2 * a * b^3 * c^3 * d + 37 * B^2 * a^4 * d^4) * i^2 * n^2 + 12 * (9 * A * B * b^4 * c^4 - 16 * A * B * a * b^3 * c^3 * d + 7 * A * B * a^4 * d^4) * i^2 * n - 12 * (7 * (B^2 * b^4 * c^4 * d^3 - B^2 * a * b^3 * d^4) * i^2 * n^2 + 12 * (A * B * b^4 * c^4 * d^3 - A * B * a * b^3 * d^4) * i^2 * n) * x^3 + 72 * (3 * A^2 * b^4 * c^4 - 4 * A^2 * a * b^3 * c^3 * d + A^2 * a^4 * d^4) * i^2 - 6 * ((5 * B^2 * b^4 * c^2 * d^2 + 32 * B^2 * a * b^3 * c * d^3 - 37 * B^2 * a^2 * b^2 * d^4) * i^2 * n^2 - 12 * (A * B * b^4 * c^2 * d^2 - 8 * A * B * a * b^3 * c * d^3 + 7 * A * B * a^2 * b^2 * d^4) * i^2 * n - 72 * (A^2 * b^4 * c^2 * d^2 - 2 * A^2 * a * b^3 * c * d^3 + A^2 * a^2 * b^2 * d^4) * i^2) * x^2 + 72 * (6 * (B^2 * b^4 * c^2 * d^2 - 2 * B^2 * a * b^3 * c * d^3 + B^2 * a^2 * b^2 * d^4) * i^2 * x^2 + 4 * (2 * B^2 * b^4 * c^3 * d - 3 * B^2 * a * b^3 * c^2 * d^2 + B^2 * a^3 * b * d^4) * i^2 * x + (3 * B^2 * b^4 * c^4 - 4 * B^2 * a * b^3 * c^3 * d + B^2 * a^4 * d^4) * i^2) * \log(e)^2 - 72 * (B^2 * b^4 * d^4 * i^2 * n^2 * x^4 + 4 * B^2 * a * b^3 * d^4 * i^2 * n^2 * x^3 - 6 * (B^2 * b^4 * c^2 * d^2 - 2 * B^2 * a * b^3 * c * d^3) * i^2 * n^2 * x^2 - 4 * (2 * B^2 * b^4 * c^3 * d - 3 * B^2 * a * b^3 * c^2 * d^2) * i^2 * n^2 * x - (3 * B^2 * b^4 * c^4 - 4 * B^2 * a * b^3 * c^3 * d) * i^2 * n^2) * \log((b*x + a)/(d*x + c))^2 + 4 * ((11 * B^2 * b^4 * c^3 * d - 48 * B^2 * a * b^3 * c^2 * d^2 + 37 * B^2 * a^3 * b * d^4) * i^2 * n^2 + 12 * (5 * A * B * b^4 * c^3 * d - 12$

```

*A*B*a*b^3*c^2*d^2 + 7*A*B*a^3*b*d^4)*i^2*n + 72*(2*A^2*b^4*c^3*d - 3*A^2*a
*b^3*c^2*d^2 + A^2*a^3*b*d^4)*i^2)*x - 12*(12*(B^2*b^4*c*d^3 - B^2*a*b^3*d^
4)*i^2*n*x^3 - (9*B^2*b^4*c^4 - 16*B^2*a*b^3*c^3*d + 7*B^2*a^4*d^4)*i^2*n -
12*(3*A*B*b^4*c^4 - 4*A*B*a*b^3*c^3*d + A*B*a^4*d^4)*i^2 - 6*((B^2*b^4*c^2
*d^2 - 8*B^2*a*b^3*c*d^3 + 7*B^2*a^2*b^2*d^4)*i^2*n + 12*(A*B*b^4*c^2*d^2 -
2*A*B*a*b^3*c*d^3 + A*B*a^2*b^2*d^4)*i^2)*x^2 - 4*((5*B^2*b^4*c^3*d - 12*B
^2*a*b^3*c^2*d^2 + 7*B^2*a^3*b*d^4)*i^2*n + 12*(2*A*B*b^4*c^3*d - 3*A*B*a*b
^3*c^2*d^2 + A*B*a^3*b*d^4)*i^2)*x + 12*(B^2*b^4*d^4*i^2*n*x^4 + 4*B^2*a*b^
3*d^4*i^2*n*x^3 - 6*(B^2*b^4*c^2*d^2 - 2*B^2*a*b^3*c*d^3)*i^2*n*x^2 - 4*(2*
B^2*b^4*c^3*d - 3*B^2*a*b^3*c^2*d^2)*i^2*n*x - (3*B^2*b^4*c^4 - 4*B^2*a*b^3
*c^3*d)*i^2*n)*log((b*x + a)/(d*x + c))*log(e) + 12*((9*B^2*b^4*c^4 - 16*B
^2*a*b^3*c^3*d)*i^2*n^2 - (7*B^2*b^4*d^4*i^2*n^2 + 12*A*B*b^4*d^4*i^2*n)*x^
4 + 12*(3*A*B*b^4*c^4 - 4*A*B*a*b^3*c^3*d)*i^2*n - 4*(12*A*B*a*b^3*d^4*i^2*
n + (3*B^2*b^4*c*d^3 + 4*B^2*a*b^3*d^4)*i^2*n^2)*x^3 + 6*((B^2*b^4*c^2*d^2
- 8*B^2*a*b^3*c*d^3)*i^2*n^2 + 12*(A*B*b^4*c^2*d^2 - 2*A*B*a*b^3*c*d^3)*i^2
*n)*x^2 + 4*((5*B^2*b^4*c^3*d - 12*B^2*a*b^3*c^2*d^2)*i^2*n^2 + 12*(2*A*B*b
^4*c^3*d - 3*A*B*a*b^3*c^2*d^2)*i^2*n)*x)*log((b*x + a)/(d*x + c))/((b^9*c
^2 - 2*a*b^8*c*d + a^2*b^7*d^2)*g^5*x^4 + 4*(a*b^8*c^2 - 2*a^2*b^7*c*d + a^
3*b^6*d^2)*g^5*x^3 + 6*(a^2*b^7*c^2 - 2*a^3*b^6*c*d + a^4*b^5*d^2)*g^5*x^2
+ 4*(a^3*b^6*c^2 - 2*a^4*b^5*c*d + a^5*b^4*d^2)*g^5*x + (a^4*b^5*c^2 - 2*a^
5*b^4*c*d + a^6*b^3*d^2)*g^5)

```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**5
,x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2 \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2}{(bgx + ag)^5} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^5,x,  
algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(b*g*x +  
a*g)^5, x)
```

$$3.177 \quad \int \frac{(ci+dx)^2 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ag+bgx)^6} dx$$

**Optimal.** Leaf size=493

$$\frac{b^2 i^2 (c+dx)^5 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)^2}{5g^6 (a+bx)^5 (bc-ad)^3} - \frac{2b^2 B i^2 n (c+dx)^5 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{25g^6 (a+bx)^5 (bc-ad)^3} - \frac{d^2 i^2 (c+dx)^3 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{3g^6 (a+bx)^3 (bc-ad)^3}$$

[Out]  $(-2*B^2*d^2*i^2*n^2*(c+d*x)^3)/(27*(b*c-a*d)^3*g^6*(a+b*x)^3) + (b*B^2*d*i^2*n^2*(c+d*x)^4)/(16*(b*c-a*d)^3*g^6*(a+b*x)^4) - (2*b^2*B^2*i^2*n^2*(c+d*x)^5)/(125*(b*c-a*d)^3*g^6*(a+b*x)^5) - (2*B*d^2*i^2*n*(c+d*x)^3*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(9*(b*c-a*d)^3*g^6*(a+b*x)^3) + (b*B*d*i^2*n*(c+d*x)^4*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(4*(b*c-a*d)^3*g^6*(a+b*x)^4) - (2*b^2*B*i^2*n*(c+d*x)^5*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(25*(b*c-a*d)^3*g^6*(a+b*x)^5) - (d^2*i^2*(c+d*x)^3*(A+B*Log[e*((a+b*x)/(c+d*x))^n])^2)/(3*(b*c-a*d)^3*g^6*(a+b*x)^3) + (b*d*i^2*(c+d*x)^4*(A+B*Log[e*((a+b*x)/(c+d*x))^n])^2)/(2*(b*c-a*d)^3*g^6*(a+b*x)^4) - (b^2*i^2*(c+d*x)^5*(A+B*Log[e*((a+b*x)/(c+d*x))^n])^2)/(5*(b*c-a*d)^3*g^6*(a+b*x)^5)$

**Rubi [C]** time = 4.31635, antiderivative size = 1085, normalized size of antiderivative = 2.2, number of steps used = 110, number of rules used = 11, integrand size = 45,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.244$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2 i^2 n^2 \log^2(a+bx) d^5}{30b^3 (bc-ad)^3 g^6} + \frac{B^2 i^2 n^2 \log^2(c+dx) d^5}{30b^3 (bc-ad)^3 g^6} - \frac{47B^2 i^2 n^2 \log(a+bx) d^5}{900b^3 (bc-ad)^3 g^6} - \frac{B i^2 n \log(a+bx) \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) d^5}{15b^3 (bc-ad)^3 g^6}$$

Antiderivative was successfully verified.

[In] Int[((c\*i + d\*i\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(a\*g + b\*g\*x)^6,x]

[Out]  $(-2*B^2*(b*c-a*d)^2*i^2*n^2)/(125*b^3*g^6*(a+b*x)^5) - (7*B^2*d*(b*c-a*d)*i^2*n^2)/(400*b^3*g^6*(a+b*x)^4) + (43*B^2*d^2*i^2*n^2)/(2700*b^3*g^6*(a+b*x)^3) - (13*B^2*d^3*i^2*n^2)/(1800*b^3*(b*c-a*d)*g^6*(a+b*x)^2) - (47*B^2*d^4*i^2*n^2)/(900*b^3*(b*c-a*d)^2*g^6*(a+b*x)) - (47*B^2*d^5*i^2*n^2*Log[a+b*x])/(900*b^3*(b*c-a*d)^3*g^6) + (B^2*d^5*i^2*n^2*Log[a+b*x]^2)/(30*b^3*(b*c-a*d)^3*g^6) - (2*B*(b*c-a*d)^2*i^2*n*(A+B*Lo$

$$\begin{aligned} & g[e*((a + b*x)/(c + d*x))^n]) / (25*b^3*g^6*(a + b*x)^5) - (3*B*d*(b*c - a*d) \\ & ) * i^2 * n * (A + B * \text{Log}[e*((a + b*x)/(c + d*x))^n]) / (20*b^3*g^6*(a + b*x)^4) - \\ & (B*d^2*i^2*n*(A + B * \text{Log}[e*((a + b*x)/(c + d*x))^n]) / (45*b^3*g^6*(a + b*x)^3) + \\ & (B*d^3*i^2*n*(A + B * \text{Log}[e*((a + b*x)/(c + d*x))^n]) / (30*b^3*(b*c - a*d) * g^6 * (a + b*x)^2) - \\ & (B*d^4*i^2*n*(A + B * \text{Log}[e*((a + b*x)/(c + d*x))^n]) / (15*b^3*(b*c - a*d)^2 * g^6 * (a + b*x)) - \\ & (B*d^5*i^2*n * \text{Log}[a + b*x] * (A + B * \text{Log}[e*((a + b*x)/(c + d*x))^n]) / (15*b^3*(b*c - a*d)^3 * g^6) - \\ & ((b*c - a*d)^2 * i^2 * (A + B * \text{Log}[e*((a + b*x)/(c + d*x))^n])^2) / (5*b^3*g^6*(a + b*x)^5) - \\ & (d * (b*c - a*d) * i^2 * (A + B * \text{Log}[e*((a + b*x)/(c + d*x))^n])^2) / (2*b^3*g^6*(a + b*x)^4) - \\ & (d^2 * i^2 * (A + B * \text{Log}[e*((a + b*x)/(c + d*x))^n])^2) / (3*b^3*g^6*(a + b*x)^3) + \\ & (47*B^2*d^5*i^2*n^2 * \text{Log}[c + d*x]) / (900*b^3*(b*c - a*d)^3 * g^6) - \\ & (B^2*d^5*i^2*n^2 * \text{Log}[-((d*(a + b*x))/(b*c - a*d))] * \text{Log}[c + d*x]) / (15*b^3*(b*c - a*d)^3 * g^6) + \\ & (B*d^5*i^2*n*(A + B * \text{Log}[e*((a + b*x)/(c + d*x))^n]) * \text{Log}[c + d*x]) / (15*b^3*(b*c - a*d)^3 * g^6) + \\ & (B^2*d^5*i^2*n^2 * \text{Log}[c + d*x]^2) / (30*b^3*(b*c - a*d)^3 * g^6) - \\ & (B^2*d^5*i^2*n^2 * \text{Log}[a + b*x] * \text{Log}[(b*(c + d*x))/(b*c - a*d)]) / (15*b^3*(b*c - a*d)^3 * g^6) - \\ & (B^2*d^5*i^2*n^2 * \text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]) / (15*b^3*(b*c - a*d)^3 * g^6) - \\ & (B^2*d^5*i^2*n^2 * \text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]) / (15*b^3*(b*c - a*d)^3 * g^6) \end{aligned}$$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x] }, Int[u, x] /; SumQ[u] ] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[(a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
```

+ n + 2, 0])

#### Rule 2524

Int[((a\_.) + Log[(c\_.)\*(Rfx\_)^(p\_.)]\*(b\_.))^(n\_.)/((d\_.) + (e\_.)\*(x\_.)), x\_Symbol] :> Simp[(Log[d + e\*x]\*(a + b\*Log[c\*Rfx^p])^n)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[d + e\*x]\*(a + b\*Log[c\*Rfx^p])^(n - 1)\*D[Rfx, x])/Rfx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]

#### Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_.))^(n\_.)]\*(b\_.))^(p\_.)\*(Rfx\_), x\_Symbol] :> With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n])^p, Rfx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[Rfx, x] && IntegerQ[p]

#### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_.))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_.) + (g\_.)\*(x\_.))^(q\_.), x\_Symbol] :> Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

#### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] :> Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

#### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_.))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_.)), x\_Symbol] :> Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

#### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_.))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_.)), x\_Symbol] :> Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

#### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps



$$\begin{aligned}
\int \frac{(177c + 177dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ag + bgx)^6} dx &= \int \left[ \frac{31329(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2 g^6 (a + bx)^6} + \frac{62658d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^2 g^6 (a + bx)^6} \right] dx \\
&= \frac{(31329d^2) \int \frac{\left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(a+bx)^4} dx}{b^2 g^6} + \frac{(62658d(bc - ad)) \int \frac{\left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(a+bx)^4} dx}{b^2 g^6} \\
&= -\frac{31329(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{5b^3 g^6 (a + bx)^5} - \frac{31329d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{2b^3 g^6 (a + bx)^5} \\
&= -\frac{31329(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{5b^3 g^6 (a + bx)^5} - \frac{31329d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{2b^3 g^6 (a + bx)^5} \\
&= -\frac{31329(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{5b^3 g^6 (a + bx)^5} - \frac{31329d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{2b^3 g^6 (a + bx)^5} \\
&= -\frac{31329(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{5b^3 g^6 (a + bx)^5} - \frac{31329d(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{2b^3 g^6 (a + bx)^5} \\
&= -\frac{62658B(bc - ad)^2 n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{25b^3 g^6 (a + bx)^5} - \frac{93987Bd(bc - ad) n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{20b^3 g^6 (a + bx)^5} \\
&= -\frac{62658B(bc - ad)^2 n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{25b^3 g^6 (a + bx)^5} - \frac{93987Bd(bc - ad) n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{20b^3 g^6 (a + bx)^5} \\
&= -\frac{62658B(bc - ad)^2 n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{25b^3 g^6 (a + bx)^5} - \frac{93987Bd(bc - ad) n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{20b^3 g^6 (a + bx)^5} \\
&= -\frac{62658B^2(bc - ad)^2 n^2}{125b^3 g^6 (a + bx)^5} - \frac{219303B^2 d(bc - ad) n^2}{400b^3 g^6 (a + bx)^4} + \frac{149683B^2 d^2 n^2}{300b^3 g^6 (a + bx)^3} \\
&= -\frac{62658B^2(bc - ad)^2 n^2}{125b^3 g^6 (a + bx)^5} - \frac{219303B^2 d(bc - ad) n^2}{400b^3 g^6 (a + bx)^4} + \frac{149683B^2 d^2 n^2}{300b^3 g^6 (a + bx)^3} \\
&= -\frac{62658B^2(bc - ad)^2 n^2}{125b^3 g^6 (a + bx)^5} - \frac{219303B^2 d(bc - ad) n^2}{400b^3 g^6 (a + bx)^4} + \frac{149683B^2 d^2 n^2}{300b^3 g^6 (a + bx)^3}
\end{aligned}$$

**Mathematica [C]** time = 3.96675, size = 2320, normalized size = 4.71

Result too large to show

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(a\*g + b\*g\*x)^6,x]

[Out] 
$$-(i^2*(10800*(b*c - a*d)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + 27000*d*(b*c - a*d)^4*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - 18000*d^2*(-(b*c) + a*d)^3*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + 1000*B*d^2*n*(a + b*x)^2*(12*(b*c - a*d)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 18*d*(b*c - a*d)^2*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 36*d^2*(b*c - a*d)*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 36*d^3*(a + b*x)^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 36*d^3*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + 36*B*d^2*n*(a + b*x)^2*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - 9*B*d*n*(a + b*x)*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) + 2*B*n*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) - 18*B*d^3*n*(a + b*x)^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 18*B*d^3*n*(a + b*x)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 375*B*d*n*(a + b*x)*(36*(b*c - a*d)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 48*d*(-(b*c) + a*d)^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 72*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 144*d^3*(-(b*c) + a*d)*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 144*d^4*(a + b*x)^4*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 144*d^4*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] - 144*B*d^3*n*(a + b*x)^3*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) + 36*B*d^2*n*(a + b*x)^2*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) - 8*B*d*n*(a + b*x)*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) + 3*B*n*(3*(b*c - a*d)^4 + 4*d*(-(b*c) + a*d)^3*(a + b*x) + 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 12*d^3*(-(b*c) + a*d)*(a + b*x)^3 - 12*d^4*(a + b*x)^4*Log[a + b*x] + 12*d^4*(a + b*x)^4*Log[c + d*x]) + 72*B*d^4*n*(a + b*x)^4*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 72*B*d^4*n*(a + b*x)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 6*B*n*(-225*a*B*d*(b*c - a*d)^4*n + 144*B*(b*c - a*d)^5*n - 225$$

```

*b*B*d*(b*c - a*d)^4*n*x + 300*a*B*d^2*(b*c - a*d)^3*n*(a + b*x) - 180*B*d*
(b*c - a*d)^4*n*(a + b*x) + 300*b*B*d^2*(b*c - a*d)^3*n*x*(a + b*x) - 450*a
*B*d^3*(b*c - a*d)^2*n*(a + b*x)^2 + 640*B*d^2*(b*c - a*d)^3*n*(a + b*x)^2
- 450*b*B*d^3*(b*c - a*d)^2*n*x*(a + b*x)^2 + 900*a*B*d^4*(b*c - a*d)*n*(a
+ b*x)^3 - 1860*B*d^3*(b*c - a*d)^2*n*(a + b*x)^3 + 900*b*B*d^4*(b*c - a*d)
*n*x*(a + b*x)^3 + 3600*b*B*c*d^4*n*(a + b*x)^4 - 3600*a*B*d^5*n*(a + b*x)^
4 + 3720*B*d^4*(b*c - a*d)*n*(a + b*x)^4 + 900*a*B*d^5*n*(a + b*x)^4*Log[a
+ b*x] + 900*b*B*d^5*n*x*(a + b*x)^4*Log[a + b*x] + 7320*B*d^5*n*(a + b*x)^
5*Log[a + b*x] + 720*(b*c - a*d)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) -
900*d*(b*c - a*d)^4*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 120
0*d^2*(b*c - a*d)^3*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 18
00*d^3*(b*c - a*d)^2*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 3
600*d^4*(b*c - a*d)*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 36
00*d^5*(a + b*x)^5*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 90
0*a*B*d^5*n*(a + b*x)^4*Log[c + d*x] - 900*b*B*d^5*n*x*(a + b*x)^4*Log[c +
d*x] - 7320*B*d^5*n*(a + b*x)^5*Log[c + d*x] - 3600*d^5*(a + b*x)^5*(A + B*
Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] - 1800*B*d^5*n*(a + b*x)^5*(Lo
g[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d])) - 2*PolyLog[2,
(d*(a + b*x))/(-(b*c) + a*d)]) + 1800*B*d^5*n*(a + b*x)^5*((2*Log[(d*(a +
b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d
*x))/(b*c - a*d)])))/(54000*b^3*(b*c - a*d)^3*g^6*(a + b*x)^5)

```

**Maple [F]** time = 0.733, size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2}{(bgx + ag)^6} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^6,x)
```

```
[Out] int((d*i*x+c*i)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^6,x)
```

**Maxima [B]** time = 6.13958, size = 14764, normalized size = 29.95

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^6,x,  
algorithm="maxima")

[Out] 
$$-1/150*A*B*c^2*i^2*n*((60*b^4*d^4*x^4 + 12*b^4*c^4 - 63*a*b^3*c^3*d + 137*a^2*b^2*c^2*d^2 - 163*a^3*b*c*d^3 + 137*a^4*d^4 - 30*(b^4*c*d^3 - 9*a*b^3*d^4)*x^3 + 10*(2*b^4*c^2*d^2 - 13*a*b^3*c*d^3 + 47*a^2*b^2*d^4)*x^2 - 5*(3*b^4*c^3*d - 17*a*b^3*c^2*d^2 + 43*a^2*b^2*c*d^3 - 77*a^3*b*d^4)*x)/((b^10*c^4 - 4*a*b^9*c^3*d + 6*a^2*b^8*c^2*d^2 - 4*a^3*b^7*c*d^3 + a^4*b^6*d^4)*g^6*x^5 + 5*(a*b^9*c^4 - 4*a^2*b^8*c^3*d + 6*a^3*b^7*c^2*d^2 - 4*a^4*b^6*c*d^3 + a^5*b^5*d^4)*g^6*x^4 + 10*(a^2*b^8*c^4 - 4*a^3*b^7*c^3*d + 6*a^4*b^6*c^2*d^2 - 4*a^5*b^5*c*d^3 + a^6*b^4*d^4)*g^6*x^3 + 10*(a^3*b^7*c^4 - 4*a^4*b^6*c^3*d + 6*a^5*b^5*c^2*d^2 - 4*a^6*b^4*c*d^3 + a^7*b^3*d^4)*g^6*x^2 + 5*(a^4*b^6*c^4 - 4*a^5*b^5*c^3*d + 6*a^6*b^4*c^2*d^2 - 4*a^7*b^3*c*d^3 + a^8*b^2*d^4)*g^6*x + (a^5*b^5*c^4 - 4*a^6*b^4*c^3*d + 6*a^7*b^3*c^2*d^2 - 4*a^8*b^2*c*d^3 + a^9*b*d^4)*g^6) + 60*d^5*log(b*x + a)/((b^6*c^5 - 5*a*b^5*c^4*d + 10*a^2*b^4*c^3*d^2 - 10*a^3*b^3*c^2*d^3 + 5*a^4*b^2*c*d^4 - a^5*b*d^5)*g^6) - 60*d^5*log(d*x + c)/((b^6*c^5 - 5*a*b^5*c^4*d + 10*a^2*b^4*c^3*d^2 - 10*a^3*b^3*c^2*d^3 + 5*a^4*b^2*c*d^4 - a^5*b*d^5)*g^6)) - 1/900*A*B*d^2*i^2*n*((47*a^2*b^4*c^4 - 278*a^3*b^3*c^3*d + 822*a^4*b^2*c^2*d^2 - 278*a^5*b*c*d^3 + 47*a^6*d^4 + 60*(10*b^6*c^2*d^2 - 5*a*b^5*c*d^3 + a^2*b^4*d^4)*x^4 - 30*(10*b^6*c^3*d - 95*a*b^5*c^2*d^2 + 46*a^2*b^4*c*d^3 - 9*a^3*b^3*d^4)*x^3 + 10*(20*b^6*c^4 - 140*a*b^5*c^3*d + 537*a^2*b^4*c^2*d^2 - 248*a^3*b^3*c*d^3 + 47*a^4*b^2*d^4)*x^2 + 5*(35*a*b^5*c^4 - 218*a^2*b^4*c^3*d + 702*a^3*b^3*c^2*d^2 - 278*a^4*b^2*c*d^3 + 47*a^5*b*d^4)*x)/((b^12*c^4 - 4*a*b^11*c^3*d + 6*a^2*b^10*c^2*d^2 - 4*a^3*b^9*c*d^3 + a^4*b^8*d^4)*g^6*x^5 + 5*(a*b^11*c^4 - 4*a^2*b^10*c^3*d + 6*a^3*b^9*c^2*d^2 - 4*a^4*b^8*c*d^3 + a^5*b^7*d^4)*g^6*x^4 + 10*(a^2*b^10*c^4 - 4*a^3*b^9*c^3*d + 6*a^4*b^8*c^2*d^2 - 4*a^5*b^7*c*d^3 + a^6*b^6*d^4)*g^6*x^3 + 10*(a^3*b^9*c^4 - 4*a^4*b^8*c^3*d + 6*a^5*b^7*c^2*d^2 - 4*a^6*b^6*c*d^3 + a^7*b^5*d^4)*g^6*x^2 + 5*(a^4*b^8*c^4 - 4*a^5*b^7*c^3*d + 6*a^6*b^6*c^2*d^2 - 4*a^7*b^5*c*d^3 + a^8*b^4*d^4)*g^6*x + (a^5*b^7*c^4 - 4*a^6*b^6*c^3*d + 6*a^7*b^5*c^2*d^2 - 4*a^8*b^4*c*d^3 + a^9*b^3*d^4)*g^6) + 60*(10*b^2*c^2*d^3 - 5*a*b*c*d^4 + a^2*d^5)*log(b*x + a)/((b^8*c^5 - 5*a*b^7*c^4*d + 10*a^2*b^6*c^3*d^2 - 10*a^3*b^5*c^2*d^3 + 5*a^4*b^4*c*d^4 - a^5*b^3*d^5)*g^6) - 60*(10*b^2*c^2*d^3 - 5*a*b*c*d^4 + a^2*d^5)*log(d*x + c)/((b^8*c^5 - 5*a*b^7*c^4*d + 10*a^2*b^6*c^3*d^2 - 10*a^3*b^5*c^2*d^3 + 5*a^4*b^4*c*d^4 - a^5*b^3*d^5)*g^6)) - 1/300*A*B*c*d*i^2*n*((27*a*b^4*c^4 - 148*a^2*b^3*c^3*d + 352*a^3*b^2*c^2*d^2 - 548*a^4*b*c*d^3 + 77*a^5*d^4 - 60*(5*b^5*c*d^3 - a*b^4*d^4)*x^4 + 30*(5*b^5*c^2*d^2 - 46*a*b^4*c*d^3 + 9*a^2*b^3*d^4)*x^3 - 10*(10*b^5*c^3*d - 67*a*b^4*c^2*d^2 + 248*a^2*b^3*c*d^3 - 47*a^3*b^2*d^4)*x^2 + 5*(15*b^5*c^4 - 88*a*b^4*c^3*d + 232*a^2*b^3*c^2*d^2 - 428*a^3*b^2*c*d^3 + 77*a^4*b*d^4)*x)/((b^11*c^4 - 4*a*b^10*c^3*d + 6*a^2*b^9*c^2*d^2 - 4*a^3*b^8*c*d^3 + a^4*b^7*d^4)*g^6*x^5 + 5*(a*b^10*c^4 - 4*a^2*b^9*c^3*d + 6*a^3*b^8*c^2*d^2 - 4*a^4*b^7*c*d^3 + a^5*b^6*d^4)*g^6*x^4 + 10*(a^2*b^9*c^4 - 4*a^3*b^8*c^3*d + 6*a^4*b^7*c^2*d^2 - 4*a^5*b^6*c*d^3 + a^6*b^5*d^4)*g^6*x^3 + 10*(a^3*b^8*c^4 - 4*a^4*b^7*c^3*d + 6*a^5*b^6*c^2*d^2 - 4*a^6*b^5*c*d^3 + a^7*b^4*d^4)*g^6*x^2 + 5*(a^4*b^7*c^4 - 4*a^5*b^6*c^3*d + 6*a^6*b^5*c^2*d^2 - 4*a^7*b^4*c*d^3 + a^8*b^3*d^4)*g^6*x + (a^5*b^6*c^4 - 4*a^6*b^5*c^3*d + 6*a^7*b^4*c^2*d^2 - 4*a^8*b^3*c*d^3 + a^9*b^2*d^4)*g^6)$$

$$\begin{aligned}
&^3 + a^6 b^5 d^4) g^6 x^3 + 10(a^3 b^8 c^4 - 4a^4 b^7 c^3 d + 6a^5 b^6 c^2 d^2 - 4a^6 b^5 c^3 d^3 + a^7 b^4 d^4) g^6 x^2 + 5(a^4 b^7 c^4 - 4a^5 b^6 c^3 d + 6a^6 b^5 c^2 d^2 - 4a^7 b^4 c^3 d^3 + a^8 b^3 d^4) g^6 x + (a^5 b^6 c^4 - 4a^6 b^5 c^3 d + 6a^7 b^4 c^2 d^2 - 4a^8 b^3 c^3 d^3 + a^9 b^2 d^4) g^6) - 60(5b^5 c^4 - a d^5) \log(bx + a) / ((b^7 c^5 - 5a b^6 c^4 d + 10a^2 b^5 c^3 d^2 - 10a^3 b^4 c^2 d^3 + 5a^4 b^3 c^3 d^4 - a^5 b^2 d^5) g^6) + 60(5b^5 c^4 - a d^5) \log(dx + c) / ((b^7 c^5 - 5a b^6 c^4 d + 10a^2 b^5 c^3 d^2 - 10a^3 b^4 c^2 d^3 + 5a^4 b^3 c^3 d^4 - a^5 b^2 d^5) g^6) - 1/10(5bx + a) B^2 c d i^2 \log(e(bx/(dx + c) + a/(dx + c)))^n)^2 / (b^7 g^6 x^5 + 5a b^6 g^6 x^4 + 10a^2 b^5 g^6 x^3 + 10a^3 b^4 g^6 x^2 + 5a^4 b^3 g^6 x + a^5 b^2 g^6) - 1/30(10b^2 x^2 + 5a b x + a^2) B^2 d^2 i^2 \log(e(bx/(dx + c) + a/(dx + c)))^n)^2 / (b^8 g^6 x^5 + 5a b^7 g^6 x^4 + 10a^2 b^6 g^6 x^3 + 10a^3 b^5 g^6 x^2 + 5a^4 b^4 g^6 x + a^5 b^3 g^6) - 1/9000(60n((60b^4 d^4 x^4 + 12b^4 c^4 - 63a b^3 c^3 d + 137a^2 b^2 c^2 d^2 - 163a^3 b c^3 d^3 + 137a^4 d^4 - 30(b^4 c^3 d - 9a b^3 d^4) x^3 + 10(2b^4 c^2 d^2 - 13a b^3 c^3 d + 47a^2 b^2 d^4) x^2 - 5(3b^4 c^3 d - 17a b^3 c^2 d^2 + 43a^2 b^2 c^3 d - 77a^3 b d^4) x) / ((b^10 c^4 - 4a b^9 c^3 d + 6a^2 b^8 c^2 d^2 - 4a^3 b^7 c^3 d + a^4 b^6 d^4) g^6 x^5 + 5(a b^9 c^4 - 4a^2 b^8 c^3 d + 6a^3 b^7 c^2 d^2 - 4a^4 b^6 c^3 d + a^5 b^5 d^4) g^6 x^4 + 10(a^2 b^8 c^4 - 4a^3 b^7 c^3 d + 6a^4 b^6 c^2 d^2 - 4a^5 b^5 c^3 d + a^6 b^4 d^4) g^6 x^3 + 10(a^3 b^7 c^4 - 4a^4 b^6 c^3 d + 6a^5 b^5 c^2 d^2 - 4a^6 b^4 c^3 d + a^7 b^3 d^4) g^6 x^2 + 5(a^4 b^6 c^4 - 4a^5 b^5 c^3 d + 6a^6 b^4 c^2 d^2 - 4a^7 b^3 c^3 d + a^8 b^2 d^4) g^6 x + (a^5 b^5 c^4 - 4a^6 b^4 c^3 d + 6a^7 b^3 c^2 d^2 - 4a^8 b^2 c^3 d + a^9 b d^4) g^6) + 60d^5 \log(bx + a) / ((b^6 c^5 - 5a b^5 c^4 d + 10a^2 b^4 c^3 d^2 - 10a^3 b^3 c^2 d^3 + 5a^4 b^2 c^3 d^4 - a^5 b d^5) g^6) - 60d^5 \log(dx + c) / ((b^6 c^5 - 5a b^5 c^4 d + 10a^2 b^4 c^3 d^2 - 10a^3 b^3 c^2 d^3 + 5a^4 b^2 c^3 d^4 - a^5 b d^5) g^6) * \log(e(bx/(dx + c) + a/(dx + c)))^n) + (144b^5 c^5 - 1125a b^4 c^4 d + 4000a^2 b^3 c^3 d^2 - 9000a^3 b^2 c^2 d^3 + 18000a^4 b c^3 d^4 - 12019a^5 d^5 + 8220(b^5 c^4 d - a b^4 d^5) x^4 - 30(77b^5 c^2 d^3 - 1250a b^4 c^3 d^4 + 1173a^2 b^3 d^5) x^3 + 10(94b^5 c^3 d^2 - 975a b^4 c^2 d^3 + 6600a^2 b^3 c^3 d^4 - 5719a^3 b^2 d^5) x^2 - 1800(b^5 d^5 x^5 + 5a b^4 d^5 x^4 + 10a^2 b^3 d^5 x^3 + 10a^3 b^2 d^5 x^2 + 5a^4 b d^5 x + a^5 d^5) * \log(bx + a)^2 - 1800(b^5 d^5 x^5 + 5a b^4 d^5 x^4 + 10a^2 b^3 d^5 x^3 + 10a^3 b^2 d^5 x^2 + 5a^4 b d^5 x + a^5 d^5) * \log(dx + c)^2 - 5(81b^5 c^4 d - 700a b^4 c^3 d^2 + 3000a^2 b^3 c^2 d^3 - 10800a^3 b^2 c^3 d^4 + 8419a^4 b d^5) x + 8220(b^5 d^5 x^5 + 5a b^4 d^5 x^4 + 10a^2 b^3 d^5 x^3 + 10a^3 b^2 d^5 x^2 + 5a^4 b d^5 x + a^5 d^5) * \log(bx + a) - 60(137b^5 d^5 x^5 + 685a b^4 d^5 x^4 + 1370a^2 b^3 d^5 x^3 + 1370a^3 b^2 d^5 x^2 + 685a^4 b d^5 x + 137a^5 d^5 - 60(b^5 d^5 x^5 + 5a b^4 d^5 x^4 + 10a^2 b^3 d^5 x^3 + 10a^3 b^2 d^5 x^2 + 5a^4 b d^5 x + a^5 d^5) * \log(bx + a)) * \log(dx + c)) n^2 / (a^5 b^6 c^5 g^6 - 5a^6 b^5 c^4 d g^6 + 10a^7 b^4 c^3 d^2 g^6 - 10a^8 b^3 c^2 d^3 g^6 + 5a^9 b^2 c^3 d^4 g^6 - a^10 b d^5 g^6 + (b^11 c^5 g^6 - 5a b^10 c^4 d g^6 + 10a^2 b^9 c^3 d^2 g^6 - 10a^3 b^8 c^2 d^3 g^6 + 5a^4 b^7 c^3 d^4 g^6 - a^5 b^6
\end{aligned}$$



$$\begin{aligned}
& - a^5 b^5 d^5 x^5 + 5(5 a^4 b^5 c^4 d^4 - a^2 b^4 d^5) x^4 + 10(5 a^2 b^4 c^4 d^4 - a^3 b^3 d^5) x^3 + 10(5 a^3 b^3 c^4 d^4 - a^4 b^2 d^5) x^2 + 5(5 a^4 b^2 c^4 d^4 - a^5 b^1 d^5) x \log(bx + a) \log(dx + c) n^2 / (a^5 b^7 c^5 g^6 - \\
& 5 a^6 b^6 c^4 d^4 g^6 + 10 a^7 b^5 c^3 d^2 g^6 - 10 a^8 b^4 c^2 d^3 g^6 + 5 a^9 b^3 c^1 d^4 g^6 - a^{10} b^2 d^5 g^6 + (b^{12} c^5 g^6 - 5 a^4 b^{11} c^4 d^4 g^6 + \\
& 10 a^2 b^{10} c^3 d^2 g^6 - 10 a^3 b^9 c^2 d^3 g^6 + 5 a^4 b^8 c^1 d^4 g^6 - a^5 b^7 d^5 g^6) x^5 + 5(a^6 b^{11} c^5 g^6 - 5 a^2 b^{10} c^4 d^4 g^6 + 10 a^3 b^9 c^3 d^2 g^6 - \\
& 10 a^4 b^8 c^2 d^3 g^6 + 5 a^5 b^7 c^1 d^4 g^6 - a^6 b^6 d^5 g^6) x^4 + 10(a^2 b^{10} c^5 g^6 - 5 a^3 b^9 c^4 d^4 g^6 + 10 a^4 b^8 c^3 d^2 g^6 - 10 a^5 b^7 c^2 d^3 g^6 + 5 a^6 b^6 c^1 d^4 g^6 - a^7 b^5 d^5 g^6) x^3 + \\
& 10(a^3 b^9 c^5 g^6 - 5 a^4 b^8 c^4 d^4 g^6 + 10 a^5 b^7 c^3 d^2 g^6 - 10 a^6 b^6 c^2 d^3 g^6 + 5 a^7 b^5 c^1 d^4 g^6 - a^8 b^4 d^5 g^6) x^2 + 5(a^4 b^8 c^5 g^6 - 5 a^5 b^7 c^4 d^4 g^6 + 10 a^6 b^6 c^3 d^2 g^6 - 10 a^7 b^5 c^2 d^3 g^6 + \\
& 5 a^8 b^4 c^1 d^4 g^6 - a^9 b^3 d^5 g^6) x \log(bx + a) \log(dx + c) n^2 - 1/54000(60 n^2 ((47 a^2 b^4 c^4 - 278 a^3 b^3 c^3 d + 822 a^4 b^2 c^2 d^2 - 278 a^5 b^1 c^1 d^3 + 47 a^6 d^4 + 60(10 b^6 c^2 d^2 - 5 a^4 b^5 c^1 d^3 + a^2 b^4 d^4) x^4 - \\
& 30(10 b^6 c^3 d - 95 a^4 b^5 c^2 d^2 + 46 a^2 b^4 c^1 d^3 - 9 a^3 b^3 d^4) x^3 + 10(20 b^6 c^4 - 140 a^4 b^5 c^3 d + 537 a^2 b^4 c^2 d^2 - 248 a^3 b^3 c^1 d^3 + 47 a^4 b^2 d^4) x^2 + 5(35 a^4 b^5 c^4 - 218 a^2 b^4 c^3 d + 702 a^3 b^3 c^2 d^2 - 278 a^4 b^2 c^1 d^3 + 47 a^5 b^1 d^4) x) / ((b^{12} c^4 - 4 a^4 b^{11} c^3 d + 6 a^2 b^{10} c^2 d^2 - 4 a^3 b^9 c^1 d^3 + a^4 b^8 d^4) g^6 x^5 + 5(a^4 b^8 c^5 g^6 - 4 a^5 b^7 c^4 d^4 g^6 x^4 + 10(a^2 b^{10} c^4 - 4 a^3 b^9 c^3 d + 6 a^4 b^8 c^2 d^2 - 4 a^5 b^7 c^1 d^3 + a^6 b^6 d^4) g^6 x^3 + 10(a^3 b^9 c^4 - 4 a^4 b^8 c^3 d + 6 a^5 b^7 c^2 d^2 - 4 a^6 b^6 c^1 d^3 + a^7 b^5 d^4) g^6 x^2 + 5(a^4 b^8 c^4 - 4 a^5 b^7 c^3 d + 6 a^6 b^6 c^2 d^2 - 4 a^7 b^5 c^1 d^3 + a^8 b^4 d^4) g^6 x + (a^5 b^7 c^4 - 4 a^6 b^6 c^3 d + 6 a^7 b^5 c^2 d^2 - 4 a^8 b^4 c^1 d^3 + a^9 b^3 d^4) g^6) + 60(10 b^2 c^2 d^3 - 5 a^4 b^1 c^1 d^4 + a^2 d^5) \log(bx + a) / ((b^8 c^5 - 5 a^4 b^7 c^4 d + 10 a^2 b^6 c^3 d^2 - 10 a^3 b^5 c^2 d^3 + 5 a^4 b^4 c^1 d^4 - a^5 b^3 d^5) g^6) - 60(10 b^2 c^2 d^3 - 5 a^4 b^1 c^1 d^4 + a^2 d^5) \log(dx + c) / ((b^8 c^5 - 5 a^4 b^7 c^4 d + 10 a^2 b^6 c^3 d^2 - 10 a^3 b^5 c^2 d^3 + 5 a^4 b^4 c^1 d^4 - a^5 b^3 d^5) g^6) \log(e(bx/(dx + c)) + a/(dx + c))^n) + (1489 a^2 b^5 c^5 - 14375 a^3 b^4 c^4 d + 85000 a^4 b^3 c^3 d^2 - 85000 a^5 b^2 c^2 d^3 + 14375 a^6 b^1 c^1 d^4 - 1489 a^7 d^5 + 60(1100 b^7 c^3 d^2 - 1425 a^4 b^6 c^2 d^3 + 372 a^2 b^5 c^1 d^4 - 47 a^3 b^4 d^5) x^4 - 30(500 b^7 c^4 d - 9825 a^4 b^6 c^3 d^2 + 11937 a^2 b^5 c^2 d^3 - 2975 a^3 b^4 c^1 d^4 + 363 a^4 b^3 d^5) x^3 + 10(400 b^7 c^5 - 5450 a^4 b^6 c^4 d + 49189 a^2 b^5 c^3 d^2 - 55525 a^3 b^4 c^2 d^3 + 12875 a^4 b^3 c^1 d^4 - 1489 a^5 b^2 d^5) x^2 - 1800(10 a^5 b^2 c^2 d^3 - 5 a^6 b^1 c^1 d^4 + a^7 d^5 + (10 b^7 c^2 d^3 - 5 a^4 b^6 c^1 d^4 + a^2 b^5 d^5) x^5 + 5(10 a^4 b^6 c^2 d^3 - 5 a^2 b^5 c^1 d^4 + a^3 b^4 d^5) x^4 + 10(10 a^2 b^5 c^2 d^3 - 5 a^3 b^4 c^1 d^4 + a^4 b^3 d^5) x^3 + 10(10 a^3 b^4 c^2 d^3 - 5 a^4 b^3 c^1 d^4 + a^5 b^2 d^5) x^2 + 5(10 a^4 b^3 c^2 d^3 - 5 a^5 b^2 c^1 d^4 + a^6 b^1 d^5) x) \log(bx + a)^2 - 1800(10 a^5 b^2 c^2 d^3 - 5 a^6 b^1 c^1 d^4 + a^7 d^5 + (10 b^7 c^2 d^3 - 5 a^4 b^6 c^1 d^4 + a^2 b^5 d^5) x^5 + 5(10 a^4 b^6 c^2 d^3 - 5 a^2 b^5 c^1 d^4 + a^3
\end{aligned}$$

$$\begin{aligned}
& *b^4*d^5)*x^4 + 10*(10*a^2*b^5*c^2*d^3 - 5*a^3*b^4*c*d^4 + a^4*b^3*d^5)*x^3 \\
& + 10*(10*a^3*b^4*c^2*d^3 - 5*a^4*b^3*c*d^4 + a^5*b^2*d^5)*x^2 + 5*(10*a^4*b^3*c^2*d^3 - 5*a^5*b^2*c*d^4 + a^6*b*d^5)*x) * \log(dx + c)^2 + 5*(925*a*b^6 \\
& *c^5 - 9911*a^2*b^5*c^4*d + 67900*a^3*b^4*c^3*d^2 - 71800*a^4*b^3*c^2*d^3 + \\
& 14375*a^5*b^2*c*d^4 - 1489*a^6*b*d^5)*x + 60*(1100*a^5*b^2*c^2*d^3 - 325*a^6*b*c*d^4 + 47*a^7*d^5 + (1100*b^7*c^2*d^3 - 325*a*b^6*c*d^4 + 47*a^2*b^5*d^5)*x^5 + 5*(1100*a*b^6*c^2*d^3 - 325*a^2*b^5*c*d^4 + 47*a^3*b^4*d^5)*x^4 \\
& + 10*(1100*a^2*b^5*c^2*d^3 - 325*a^3*b^4*c*d^4 + 47*a^4*b^3*d^5)*x^3 + 10*(1100*a^3*b^4*c^2*d^3 - 325*a^4*b^3*c*d^4 + 47*a^5*b^2*d^5)*x^2 + 5*(1100*a^4*b^3*c^2*d^3 - 325*a^5*b^2*c*d^4 + 47*a^6*b*d^5)*x) * \log(b*x + a) - 60*(110 \\
& 0*a^5*b^2*c^2*d^3 - 325*a^6*b*c*d^4 + 47*a^7*d^5 + (1100*b^7*c^2*d^3 - 325*a*b^6*c*d^4 + 47*a^2*b^5*d^5)*x^5 + 5*(1100*a*b^6*c^2*d^3 - 325*a^2*b^5*c*d^4 + 47*a^3*b^4*d^5)*x^4 + 10*(1100*a^2*b^5*c^2*d^3 - 325*a^3*b^4*c*d^4 + 4 \\
& 7*a^4*b^3*d^5)*x^3 + 10*(1100*a^3*b^4*c^2*d^3 - 325*a^4*b^3*c*d^4 + 47*a^5*b^2*d^5)*x^2 + 5*(1100*a^4*b^3*c^2*d^3 - 325*a^5*b^2*c*d^4 + 47*a^6*b*d^5)*x \\
& - 60*(10*a^5*b^2*c^2*d^3 - 5*a^6*b*c*d^4 + a^7*d^5 + (10*b^7*c^2*d^3 - 5*a*b^6*c*d^4 + a^2*b^5*d^5)*x^5 + 5*(10*a*b^6*c^2*d^3 - 5*a^2*b^5*c*d^4 + a^3*b^4*d^5)*x^4 + 10*(10*a^2*b^5*c^2*d^3 - 5*a^3*b^4*c*d^4 + a^4*b^3*d^5)*x^3 \\
& + 10*(10*a^3*b^4*c^2*d^3 - 5*a^4*b^3*c*d^4 + a^5*b^2*d^5)*x^2 + 5*(10*a^4*b^3*c^2*d^3 - 5*a^5*b^2*c*d^4 + a^6*b*d^5)*x) * \log(b*x + a) * \log(dx + c) * \\
& n^2 / (a^5*b^8*c^5*g^6 - 5*a^6*b^7*c^4*d*g^6 + 10*a^7*b^6*c^3*d^2*g^6 - 10*a^8*b^5*c^2*d^3*g^6 + 5*a^9*b^4*c*d^4*g^6 - a^10*b^3*d^5*g^6 + (b^13*c^5*g^6 \\
& - 5*a*b^12*c^4*d*g^6 + 10*a^2*b^11*c^3*d^2*g^6 - 10*a^3*b^10*c^2*d^3*g^6 + 5*a^4*b^9*c*d^4*g^6 - a^5*b^8*d^5*g^6) * x^5 + 5*(a*b^12*c^5*g^6 - 5*a^2*b^11 \\
& *c^4*d*g^6 + 10*a^3*b^10*c^3*d^2*g^6 - 10*a^4*b^9*c^2*d^3*g^6 + 5*a^5*b^8*c \\
& *d^4*g^6 - a^6*b^7*d^5*g^6) * x^4 + 10*(a^2*b^11*c^5*g^6 - 5*a^3*b^10*c^4*d*g^6 \\
& + 10*a^4*b^9*c^3*d^2*g^6 - 10*a^5*b^8*c^2*d^3*g^6 + 5*a^6*b^7*c*d^4*g^6 \\
& - a^7*b^6*d^5*g^6) * x^3 + 10*(a^3*b^10*c^5*g^6 - 5*a^4*b^9*c^4*d*g^6 + 10*a^5 \\
& *b^8*c^3*d^2*g^6 - 10*a^6*b^7*c^2*d^3*g^6 + 5*a^7*b^6*c*d^4*g^6 - a^8*b^5*d^5 \\
& *g^6) * x^2 + 5*(a^4*b^9*c^5*g^6 - 5*a^5*b^8*c^4*d*g^6 + 10*a^6*b^7*c^3*d^2 \\
& *g^6 - 10*a^7*b^6*c^2*d^3*g^6 + 5*a^8*b^5*c*d^4*g^6 - a^9*b^4*d^5*g^6) * x) \\
& * B^2*d^2*i^2 - 1/5*(5*b*x + a) * A*B*c*d*i^2 * \log(e*(b*x/(dx + c) + a/(dx + c)))^n) / (b^7*g^6*x^5 + 5*a*b^6*g^6*x^4 + 10*a^2*b^5*g^6*x^3 + 10*a^3*b^4*g^6*x^2 + 5*a^4*b^3*g^6*x + a^5*b^2*g^6) - 1/15*(10*b^2*x^2 + 5*a*b*x + a^2) * A \\
& * B*d^2*i^2 * \log(e*(b*x/(dx + c) + a/(dx + c)))^n) / (b^8*g^6*x^5 + 5*a*b^7*g^6 \\
& *x^4 + 10*a^2*b^6*g^6*x^3 + 10*a^3*b^5*g^6*x^2 + 5*a^4*b^4*g^6*x + a^5*b^3 \\
& *g^6) - 1/5*B^2*c^2*i^2 * \log(e*(b*x/(dx + c) + a/(dx + c)))^n) / (b^6*g^6*x^5 \\
& + 5*a*b^5*g^6*x^4 + 10*a^2*b^4*g^6*x^3 + 10*a^3*b^3*g^6*x^2 + 5*a^4*b^2* \\
& g^6*x + a^5*b*g^6) - 1/10*(5*b*x + a) * A^2*c*d*i^2 / (b^7*g^6*x^5 + 5*a*b^6*g^6 \\
& *x^4 + 10*a^2*b^5*g^6*x^3 + 10*a^3*b^4*g^6*x^2 + 5*a^4*b^3*g^6*x + a^5*b^2 \\
& *g^6) - 1/30*(10*b^2*x^2 + 5*a*b*x + a^2) * A^2*d^2*i^2 / (b^8*g^6*x^5 + 5*a*b^7 \\
& *g^6*x^4 + 10*a^2*b^6*g^6*x^3 + 10*a^3*b^5*g^6*x^2 + 5*a^4*b^4*g^6*x + a^5 \\
& *b^3*g^6) - 2/5*A*B*c^2*i^2 * \log(e*(b*x/(dx + c) + a/(dx + c)))^n) / (b^6*g^6 \\
& *x^5 + 5*a*b^5*g^6*x^4 + 10*a^2*b^4*g^6*x^3 + 10*a^3*b^3*g^6*x^2 + 5*a^4*b^2 \\
& *g^6*x + a^5*b*g^6) - 1/5*A^2*c^2*i^2 / (b^6*g^6*x^5 + 5*a*b^5*g^6*x^4 + 10*
\end{aligned}$$



$$a^2*b^4*g^6*x^3 + 10*a^3*b^3*g^6*x^2 + 5*a^4*b^2*g^6*x + a^5*b*g^6)$$

**Fricas [B]** time = 0.835333, size = 5374, normalized size = 10.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^6,x,
algorithm="fricas")
```

```
[Out] -1/54000*((864*B^2*b^5*c^5 - 3375*B^2*a*b^4*c^4*d + 4000*B^2*a^2*b^3*c^3*d^2 - 1489*B^2*a^5*d^5)*i^2*n^2 + 60*(47*(B^2*b^5*c*d^4 - B^2*a*b^4*d^5)*i^2*n^2 + 60*(A*B*b^5*c*d^4 - A*B*a*b^4*d^5)*i^2*n)*x^4 + 60*(72*A*B*b^5*c^5 - 225*A*B*a*b^4*c^4*d + 200*A*B*a^2*b^3*c^3*d^2 - 47*A*B*a^5*d^5)*i^2*n + 30*((13*B^2*b^5*c^2*d^3 + 350*B^2*a*b^4*c*d^4 - 363*B^2*a^2*b^3*d^5)*i^2*n^2 - 60*(A*B*b^5*c^2*d^3 - 10*A*B*a*b^4*c*d^4 + 9*A*B*a^2*b^3*d^5)*i^2*n)*x^3 + 1800*(6*A^2*b^5*c^5 - 15*A^2*a*b^4*c^4*d + 10*A^2*a^2*b^3*c^3*d^2 - A^2*a^5*d^5)*i^2 - 10*((86*B^2*b^5*c^3*d^2 - 375*B^2*a*b^4*c^2*d^3 - 1200*B^2*a^2*b^3*c*d^4 + 1489*B^2*a^3*b^2*d^5)*i^2*n^2 - 60*(2*A*B*b^5*c^3*d^2 - 15*A*B*a*b^4*c^2*d^3 + 60*A*B*a^2*b^3*c*d^4 - 47*A*B*a^3*b^2*d^5)*i^2*n - 1800*(A^2*b^5*c^3*d^2 - 3*A^2*a*b^4*c^2*d^3 + 3*A^2*a^2*b^3*c*d^4 - A^2*a^3*b^2*d^5)*i^2)*x^2 + 1800*(10*(B^2*b^5*c^3*d^2 - 3*B^2*a*b^4*c^2*d^3 + 3*B^2*a^2*b^3*c*d^4 - B^2*a^3*b^2*d^5)*i^2*x^2 + 5*(3*B^2*b^5*c^4*d - 8*B^2*a*b^4*c^3*d^2 + 6*B^2*a^2*b^3*c^2*d^3 - B^2*a^4*b*d^5)*i^2*x + (6*B^2*b^5*c^5 - 15*B^2*a*b^4*c^4*d + 10*B^2*a^2*b^3*c^3*d^2 - B^2*a^5*d^5)*i^2)*log(e)^2 + 1800*(B^2*b^5*d^5*i^2*n^2*x^5 + 5*B^2*a*b^4*d^5*i^2*n^2*x^4 + 10*B^2*a^2*b^3*d^5*i^2*n^2*x^3 + 10*(B^2*b^5*c^3*d^2 - 3*B^2*a*b^4*c^2*d^3 + 3*B^2*a^2*b^3*c*d^4)*i^2*n^2*x^2 + 5*(3*B^2*b^5*c^4*d - 8*B^2*a*b^4*c^3*d^2 + 6*B^2*a^2*b^3*c^2*d^3)*i^2*n^2*x + (6*B^2*b^5*c^5 - 15*B^2*a*b^4*c^4*d + 10*B^2*a^2*b^3*c^3*d^2)*i^2*n^2)*log((b*x + a)/(d*x + c))^2 + 5*((189*B^2*b^5*c^4*d - 1100*B^2*a*b^4*c^3*d^2 + 2400*B^2*a^2*b^3*c^2*d^3 - 1489*B^2*a^4*b*d^5)*i^2*n^2 + 60*(27*A*B*b^5*c^4*d - 100*A*B*a*b^4*c^3*d^2 + 120*A*B*a^2*b^3*c^2*d^3 - 47*A*B*a^4*b*d^5)*i^2*n + 1800*(3*A^2*b^5*c^4*d - 8*A^2*a*b^4*c^3*d^2 + 6*A^2*a^2*b^3*c^2*d^3 - A^2*a^4*b*d^5)*i^2)*x + 60*(60*(B^2*b^5*c*d^4 - B^2*a*b^4*d^5)*i^2*n*x^4 - 30*(B^2*b^5*c^2*d^3 - 10*B^2*a*b^4*c*d^4 + 9*B^2*a^2*b^3*d^5)*i^2*n*x^3 + (72*B^2*b^5*c^5 - 225*B^2*a*b^4*c^4*d + 200*B^2*a^2*b^3*c^3*d^2 - 47*B^2*a^5*d^5)*i^2*n + 60*(6*A*B*b^5*c^5 - 15*A*B*a*b^4*c^4*d + 10*A*B*a^2*b^3*c^3*d^2 - A*B*a^5*d^5)*i^2 + 10*((2*B^2*b^5*c^3*d^2 - 15*B^2*a*b^4*c^2*d^3 + 60*B^2*a^2*b^3*c*d^4 - 47*B^2*a^3*b^2*d^5)*i^2*n + 60*(A*B*b^5*c^3*d^2 - 3*A*B*a*b^4*c^2*d^3 + 3*A*B*a^2*b^3*c*d^4 - A*B*a^3*b^2*d^5)*i^2)*x^2 + 5*((27*B^2*b^5*c^4*d - 100*B^2*a*b^4*c^3*d^2 + 120*B^2*a^2*b^3
```

```

3*c^2*d^3 - 47*B^2*a^4*b*d^5)*i^2*n + 60*(3*A*B*b^5*c^4*d - 8*A*B*a*b^4*c^3
*d^2 + 6*A*B*a^2*b^3*c^2*d^3 - A*B*a^4*b*d^5)*i^2)*x + 60*(B^2*b^5*d^5*i^2*
n*x^5 + 5*B^2*a*b^4*d^5*i^2*n*x^4 + 10*B^2*a^2*b^3*d^5*i^2*n*x^3 + 10*(B^2*
b^5*c^3*d^2 - 3*B^2*a*b^4*c^2*d^3 + 3*B^2*a^2*b^3*c*d^4)*i^2*n*x^2 + 5*(3*B
^2*b^5*c^4*d - 8*B^2*a*b^4*c^3*d^2 + 6*B^2*a^2*b^3*c^2*d^3)*i^2*n*x + (6*B
^2*b^5*c^5 - 15*B^2*a*b^4*c^4*d + 10*B^2*a^2*b^3*c^3*d^2)*i^2*n)*log((b*x +
a)/(d*x + c))*log(e) + 60*((47*B^2*b^5*d^5*i^2*n^2 + 60*A*B*b^5*d^5*i^2*n)
*x^5 + (72*B^2*b^5*c^5 - 225*B^2*a*b^4*c^4*d + 200*B^2*a^2*b^3*c^3*d^2)*i^2
*n^2 + 5*(60*A*B*a*b^4*d^5*i^2*n + (12*B^2*b^5*c*d^4 + 35*B^2*a*b^4*d^5)*i^
2*n^2)*x^4 + 60*(6*A*B*b^5*c^5 - 15*A*B*a*b^4*c^4*d + 10*A*B*a^2*b^3*c^3*d^
2)*i^2*n + 10*(60*A*B*a^2*b^3*d^5*i^2*n - (3*B^2*b^5*c^2*d^3 - 30*B^2*a*b^4
*c*d^4 - 20*B^2*a^2*b^3*d^5)*i^2*n^2)*x^3 + 10*((2*B^2*b^5*c^3*d^2 - 15*B^2
*a*b^4*c^2*d^3 + 60*B^2*a^2*b^3*c*d^4)*i^2*n^2 + 60*(A*B*b^5*c^3*d^2 - 3*A
B*a*b^4*c^2*d^3 + 3*A*B*a^2*b^3*c*d^4)*i^2*n)*x^2 + 5*((27*B^2*b^5*c^4*d -
100*B^2*a*b^4*c^3*d^2 + 120*B^2*a^2*b^3*c^2*d^3)*i^2*n^2 + 60*(3*A*B*b^5*c^
4*d - 8*A*B*a*b^4*c^3*d^2 + 6*A*B*a^2*b^3*c^2*d^3)*i^2*n)*x)*log((b*x + a)/
(d*x + c)))/((b^11*c^3 - 3*a*b^10*c^2*d + 3*a^2*b^9*c*d^2 - a^3*b^8*d^3)*g^
6*x^5 + 5*(a*b^10*c^3 - 3*a^2*b^9*c^2*d + 3*a^3*b^8*c*d^2 - a^4*b^7*d^3)*g^
6*x^4 + 10*(a^2*b^9*c^3 - 3*a^3*b^8*c^2*d + 3*a^4*b^7*c*d^2 - a^5*b^6*d^3)*
g^6*x^3 + 10*(a^3*b^8*c^3 - 3*a^4*b^7*c^2*d + 3*a^5*b^6*c*d^2 - a^6*b^5*d^3)
)*g^6*x^2 + 5*(a^4*b^7*c^3 - 3*a^5*b^6*c^2*d + 3*a^6*b^5*c*d^2 - a^7*b^4*d^
3)*g^6*x + (a^5*b^6*c^3 - 3*a^6*b^5*c^2*d + 3*a^7*b^4*c*d^2 - a^8*b^3*d^3)*
g^6)

```

---

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```

[In] integrate((d*i*x+c*i)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**6
,x)

```

```

[Out] Timed out

```

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^2 \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2}{(bgx + ag)^6} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^6,x,  
algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(b*g*x +  
a*g)^6, x)
```

$$3.178 \quad \int (ag+bgx)^3(ci+dix)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx$$

**Optimal.** Leaf size=1172

result too large to display

```
[Out] (5*B^2*(b*c - a*d)^6*g^3*i^3*n^2*x)/(84*b^3*d^3) + (B^2*(b*c - a*d)^3*g^3*i^3*n^2*(a + b*x)^4)/(140*b^4) - (29*B^2*(b*c - a*d)^5*g^3*i^3*n^2*(c + d*x)^2)/(840*b^2*d^4) + (47*B^2*(b*c - a*d)^4*g^3*i^3*n^2*(c + d*x)^3)/(1260*b*d^4) - (13*B^2*(b*c - a*d)^3*g^3*i^3*n^2*(c + d*x)^4)/(420*d^4) + (b*B^2*(b*c - a*d)^2*g^3*i^3*n^2*(c + d*x)^5)/(105*d^4) - (B*(b*c - a*d)^4*g^3*i^3*n*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(210*b^4*d) - (3*B*(b*c - a*d)^3*g^3*i^3*n*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(140*b^4) - (B*(b*c - a*d)^2*g^3*i^3*n*(a + b*x)^4*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(35*b^3) + (2*B*(b*c - a*d)^4*g^3*i^3*n*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(21*b*d^4) - (3*B*(b*c - a*d)^3*g^3*i^3*n*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(14*d^4) + (6*b*B*(b*c - a*d)^2*g^3*i^3*n*(c + d*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(35*d^4) - (b^2*B*(b*c - a*d)*g^3*i^3*n*(c + d*x)^6*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(21*d^4) + ((b*c - a*d)^3*g^3*i^3*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(140*b^4) + ((b*c - a*d)^2*g^3*i^3*(a + b*x)^4*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(35*b^3) + ((b*c - a*d)*g^3*i^3*(a + b*x)^4*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(14*b^2) + (g^3*i^3*(a + b*x)^4*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(7*b) + (B*(b*c - a*d)^5*g^3*i^3*n*(a + b*x)^2*(3*A + B*n + 3*B*Log[e*((a + b*x)/(c + d*x))^n]))/(420*b^4*d^2) - (B*(b*c - a*d)^6*g^3*i^3*n*(a + b*x)*(6*A + 5*B*n + 6*B*Log[e*((a + b*x)/(c + d*x))^n]))/(420*b^4*d^3) - (B*(b*c - a*d)^7*g^3*i^3*n*(6*A + 11*B*n + 6*B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(420*b^4*d^4) - (B^2*(b*c - a*d)^7*g^3*i^3*n^2*Log[(a + b*x)/(c + d*x)])/(210*b^4*d^4) - (11*B^2*(b*c - a*d)^7*g^3*i^3*n^2*Log[c + d*x])/(420*b^4*d^4) - (B^2*(b*c - a*d)^7*g^3*i^3*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(70*b^4*d^4)
```

**Rubi [A]** time = 4.47879, antiderivative size = 961, normalized size of antiderivative = 0.82, number of steps used = 118, number of rules used = 13, integrand size = 45,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.289$ , Rules used = {2528, 2525, 12, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{B^2 g^3 i^3 n^2 \log^2(c + dx)(bc - ad)^7}{140 b^4 d^4} - \frac{B^2 g^3 i^3 n^2 \log\left(-\frac{d(a+bx)}{bc-ad}\right) \log(c + dx)(bc - ad)^7}{70 b^4 d^4} + \frac{B g^3 i^3 n \left( A + B \log\left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) \log(c - dx)}{70 b^4 d^4}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] -(A*B*(b*c - a*d)^6*g^3*i^3*n*x)/(70*b^3*d^3) + (B^2*(b*c - a*d)^6*g^3*i^3*n^2*x)/(70*b^3*d^3) - (3*B^2*(b*c - a*d)^5*g^3*i^3*n^2*(a + b*x)^2)/(280*b^4*d^2) + (11*B^2*(b*c - a*d)^4*g^3*i^3*n^2*(a + b*x)^3)/(1260*b^4*d) + (B^2*(b*c - a*d)^3*g^3*i^3*n^2*(a + b*x)^4)/(42*b^4) + (B^2*d*(b*c - a*d)^2*g^3*i^3*n^2*(a + b*x)^5)/(105*b^4) - (B^2*(b*c - a*d)^6*g^3*i^3*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(70*b^4*d^3) + (B*(b*c - a*d)^5*g^3*i^3*n*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(140*b^4*d^2) - (B*(b*c - a*d)^4*g^3*i^3*n*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(210*b^4*d) - (17*B*(b*c - a*d)^3*g^3*i^3*n*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(140*b^4) - (B*d^2*(b*c - a*d)^2*g^3*i^3*n*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(7*b^4) - (B*d^2*(b*c - a*d)*g^3*i^3*n*(a + b*x)^6*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(21*b^4) + ((b*c - a*d)^3*g^3*i^3*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(4*b^4) + (3*d*(b*c - a*d)^2*g^3*i^3*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(5*b^4) + (d^2*(b*c - a*d)*g^3*i^3*(a + b*x)^6*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*b^4) + (d^3*g^3*i^3*(a + b*x)^7*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(7*b^4) - (B^2*(b*c - a*d)^7*g^3*i^3*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(70*b^4*d^4) + (B*(b*c - a*d)^7*g^3*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(70*b^4*d^4) + (B^2*(b*c - a*d)^7*g^3*i^3*n^2*Log[c + d*x]^2)/(140*b^4*d^4) - (B^2*(b*c - a*d)^7*g^3*i^3*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(70*b^4*d^4)
```

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q]^r]^s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

### Rule 31

```
Int[((a_) + (b_.)*(x_))^(n_), x_Symbol] := Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

### Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

### Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)
]^n))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]*(b_.))^(p_.)*((f_) + (g_.
)*(x_)^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\begin{aligned}
\int (178c + 178dx)^3 (ag + bgx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx &= \int \left( \frac{(-bc + ad)^3 g^3 (178c + 178dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{d^3} \right) dx \\
&= \frac{(b^3 g^3) \int (178c + 178dx)^6 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx}{5639752d^3} \\
&= -\frac{1409938(bc - ad)^3 g^3 (c + dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{d^4} \\
&= -\frac{1409938(bc - ad)^3 g^3 (c + dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{d^4} \\
&= -\frac{1409938(bc - ad)^3 g^3 (c + dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{d^4} \\
&= -\frac{1409938(bc - ad)^3 g^3 (c + dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{d^4} \\
&= -\frac{1409938(bc - ad)^3 g^3 (c + dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{d^4} \\
&= \frac{2819876AB(bc - ad)^6 g^3 nx}{35b^3 d^3} + \frac{1409938B(bc - ad)^5 g^3 n(c + dx)^4}{35b^3 d^3} \\
&= \frac{2819876AB(bc - ad)^6 g^3 nx}{35b^3 d^3} + \frac{2819876B^2(bc - ad)^6 g^3 n(c + dx)^4}{35b^4 d^3} \\
&= \frac{2819876AB(bc - ad)^6 g^3 nx}{35b^3 d^3} + \frac{2819876B^2(bc - ad)^6 g^3 n(c + dx)^4}{35b^4 d^3} \\
&= \frac{2819876AB(bc - ad)^6 g^3 nx}{35b^3 d^3} + \frac{2819876B^2(bc - ad)^6 g^3 n^2(c + dx)^4}{35b^3 d^3} \\
&= \frac{2819876AB(bc - ad)^6 g^3 nx}{35b^3 d^3} + \frac{2819876B^2(bc - ad)^6 g^3 n^2(c + dx)^4}{35b^3 d^3} \\
&= \frac{2819876AB(bc - ad)^6 g^3 nx}{35b^3 d^3} + \frac{2819876B^2(bc - ad)^6 g^3 n^2(c + dx)^4}{35b^3 d^3}
\end{aligned}$$



**Mathematica [B]** time = 3.81964, size = 2448, normalized size = 2.09

Result too large to show

Antiderivative was successfully verified.

[In] Integrate[(a\*g + b\*g\*x)^3\*(c\*i + d\*i\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2,x]

[Out] (g^3\*i^3\*(35\*(b\*c - a\*d)^3\*(a + b\*x)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2 + 84\*d\*(b\*c - a\*d)^2\*(a + b\*x)^5\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2 + 70\*d^2\*(b\*c - a\*d)\*(a + b\*x)^6\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2 + 20\*d^3\*(a + b\*x)^7\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2 - (35\*B\*(b\*c - a\*d)^4\*n\*(6\*A\*b\*d\*(b\*c - a\*d)^2\*x + 6\*B\*d\*(b\*c - a\*d)^2\*(a + b\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n] + 3\*d^2\*(-(b\*c) + a\*d)\*(a + b\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 2\*d^3\*(a + b\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 6\*B\*(b\*c - a\*d)^3\*n\*Log[c + d\*x] - 6\*(b\*c - a\*d)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[c + d\*x] + B\*(b\*c - a\*d)\*n\*(2\*b\*d\*(b\*c - a\*d)\*x - d^2\*(a + b\*x)^2 - 2\*(b\*c - a\*d)^2\*Log[c + d\*x]) + 3\*B\*(b\*c - a\*d)^2\*n\*(b\*d\*x + (-(b\*c) + a\*d)\*Log[c + d\*x]) + 3\*B\*(b\*c - a\*d)^3\*n\*((2\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)] - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])))/(3\*d^4) + (7\*B\*(b\*c - a\*d)^3\*n\*(24\*A\*b\*d\*(b\*c - a\*d)^3\*x + 24\*B\*d\*(b\*c - a\*d)^3\*(a + b\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n] - 12\*d^2\*(b\*c - a\*d)^2\*(a + b\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 8\*d^3\*(b\*c - a\*d)\*(a + b\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 6\*d^4\*(a + b\*x)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 24\*B\*(b\*c - a\*d)^4\*n\*Log[c + d\*x] - 24\*(b\*c - a\*d)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[c + d\*x] + 4\*B\*(b\*c - a\*d)^2\*n\*(2\*b\*d\*(b\*c - a\*d)\*x - d^2\*(a + b\*x)^2 - 2\*(b\*c - a\*d)^2\*Log[c + d\*x]) + B\*(b\*c - a\*d)\*n\*(6\*b\*d\*(b\*c - a\*d)^2\*x + 3\*d^2\*(-(b\*c) + a\*d)\*(a + b\*x)^2 + 2\*d^3\*(a + b\*x)^3 - 6\*(b\*c - a\*d)^3\*Log[c + d\*x]) + 12\*B\*(b\*c - a\*d)^3\*n\*(b\*d\*x + (-(b\*c) + a\*d)\*Log[c + d\*x]) + 12\*B\*(b\*c - a\*d)^4\*n\*((2\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)] - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])))/d^4 - (7\*B\*(b\*c - a\*d)^2\*n\*(120\*A\*b\*d\*(b\*c - a\*d)^4\*x + 120\*B\*d\*(b\*c - a\*d)^4\*(a + b\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n] + 60\*d^2\*(-(b\*c) + a\*d)^3\*(a + b\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 40\*d^3\*(b\*c - a\*d)^2\*(a + b\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 30\*d^4\*(-(b\*c) + a\*d)\*(a + b\*x)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 24\*d^5\*(a + b\*x)^5\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 120\*B\*(b\*c - a\*d)^5\*n\*Log[c + d\*x] - 120\*(b\*c - a\*d)^5\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[c + d\*x] + 20\*B\*(b\*c - a\*d)^3\*n\*(2\*b\*d\*(b\*c - a\*d)\*x - d^2\*(a + b\*x)^2 - 2\*(b\*c - a\*d)^2\*Log[c + d\*x]) + 5\*B\*(b\*c - a\*d)^2\*n\*(6\*b\*d\*(b\*c - a\*d)^2\*x + 3\*d^2\*(-(b\*c) + a\*d)\*(a + b\*x)^2 + 2\*d^3\*(a + b\*x)^3 - 6\*(b\*c - a\*d)^3\*Log[c + d\*x]) + 2\*B\*(b\*c - a\*d)\*n\*(12\*b\*d\*(b\*c - a\*d)^3\*x - 6\*d^2\*(b\*c - a\*d)^2\*(a + b\*x)^2 + 4\*d^3\*(b\*c - a\*d)\*(a + b\*x)^3 - 3

```

*d^4*(a + b*x)^4 - 12*(b*c - a*d)^4*Log[c + d*x]) + 60*B*(b*c - a*d)^4*n*(b
*d*x + (-b*c) + a*d)*Log[c + d*x]) + 60*B*(b*c - a*d)^5*n*((2*Log[(d*(a +
b*x))/(-b*c) + a*d]) - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d
*x))/(b*c - a*d)))])))/(6*d^4) + (B*(b*c - a*d)*n*(360*A*b*d*(b*c - a*d)^5*x
+ 60*b^2*B*c*d*(b*c - a*d)^4*n*x - 60*a*b*B*d^2*(b*c - a*d)^4*n*x + 462*b*B
*d*(b*c - a*d)^5*n*x - 30*b*B*c*d^2*(b*c - a*d)^3*n*(a + b*x)^2 + 30*a*B*d^
3*(b*c - a*d)^3*n*(a + b*x)^2 - 141*B*d^2*(b*c - a*d)^4*n*(a + b*x)^2 + 20*
b*B*c*d^3*(b*c - a*d)^2*n*(a + b*x)^3 - 20*a*B*d^4*(b*c - a*d)^2*n*(a + b*x
)^3 + 54*B*d^3*(b*c - a*d)^3*n*(a + b*x)^3 - 15*b*B*c*d^4*(b*c - a*d)*n*(a
+ b*x)^4 + 15*a*B*d^5*(b*c - a*d)*n*(a + b*x)^4 - 18*B*d^4*(b*c - a*d)^2*n*
(a + b*x)^4 + 12*b*B*c*d^5*n*(a + b*x)^5 - 12*a*B*d^6*n*(a + b*x)^5 + 360*B
*d*(b*c - a*d)^5*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] - 180*d^2*(b*c -
a*d)^4*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 120*d^3*(b*c -
a*d)^3*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 90*d^4*(b*c - a
*d)^2*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 72*d^5*(b*c - a*
d)*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 60*d^6*(a + b*x)^6*
(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 60*b*B*c*(b*c - a*d)^5*n*Log[c + d
*x] + 60*a*B*d*(b*c - a*d)^5*n*Log[c + d*x] - 822*B*(b*c - a*d)^6*n*Log[c +
d*x] - 360*(b*c - a*d)^6*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*
x] + 180*B*(b*c - a*d)^6*n*((2*Log[(d*(a + b*x))/(-b*c) + a*d]) - Log[c +
d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)))])))/(9*d^4)))/(
140*b^4)

```

---

**Maple [F]** time = 0.726, size = 0, normalized size = 0.

$$\int (bgx + ag)^3 (dix + ci)^3 \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^3\*(d\*i\*x+c\*i)^3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2,x)

[Out] int((b\*g\*x+a\*g)^3\*(d\*i\*x+c\*i)^3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2,x)

---

**Maxima [B]** time = 4.43479, size = 10591, normalized size = 9.04

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(d\*i\*x+c\*i)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2,x,  
algorithm="maxima")

[Out]  $2/7*A*B*b^3*d^3*g^3*i^3*x^7*\log(e*(b*x/(d*x+c)+a/(d*x+c))^n)+1/7*A^2*b^3*d^3*g^3*i^3*x^7+A*B*b^3*c*d^2*g^3*i^3*x^6*\log(e*(b*x/(d*x+c)+a/(d*x+c))^n)+A*B*a*b^2*d^3*g^3*i^3*x^6*\log(e*(b*x/(d*x+c)+a/(d*x+c))^n)+1/2*A^2*b^3*c*d^2*g^3*i^3*x^6+1/2*A^2*a*b^2*d^3*g^3*i^3*x^6+6/5*A*B*b^3*c^2*d*g^3*i^3*x^5*\log(e*(b*x/(d*x+c)+a/(d*x+c))^n)+18/5*A*B*a*b^2*c*d^2*g^3*i^3*x^5*\log(e*(b*x/(d*x+c)+a/(d*x+c))^n)+6/5*A*B*a^2*b*d^3*g^3*i^3*x^5*\log(e*(b*x/(d*x+c)+a/(d*x+c))^n)+3/5*A^2*b^3*c^2*d*g^3*i^3*x^5+9/5*A^2*a*b^2*c*d^2*g^3*i^3*x^5+3/5*A^2*a^2*b*d^3*g^3*i^3*x^5+1/2*A*B*b^3*c^3*g^3*i^3*x^4*\log(e*(b*x/(d*x+c)+a/(d*x+c))^n)+9/2*A*B*a*b^2*c^2*d*g^3*i^3*x^4*\log(e*(b*x/(d*x+c)+a/(d*x+c))^n)+9/2*A*B*a^2*b*c*d^2*g^3*i^3*x^4*\log(e*(b*x/(d*x+c)+a/(d*x+c))^n)+1/2*A*B*a^3*d^3*g^3*i^3*x^4*\log(e*(b*x/(d*x+c)+a/(d*x+c))^n)+1/4*A^2*b^3*c^3*g^3*i^3*x^4+9/4*A^2*a*b^2*c^2*d*g^3*i^3*x^4+9/4*A^2*a^2*b*c*d^2*g^3*i^3*x^4+1/4*A^2*a^3*d^3*g^3*i^3*x^4+2*A*B*a*b^2*c^3*g^3*i^3*x^3*\log(e*(b*x/(d*x+c)+a/(d*x+c))^n)+6*A*B*a^2*b*c^2*d*g^3*i^3*x^3*\log(e*(b*x/(d*x+c)+a/(d*x+c))^n)+2*A*B*a^3*c*d^2*g^3*i^3*x^3*\log(e*(b*x/(d*x+c)+a/(d*x+c))^n)+A^2*a*b^2*c^3*g^3*i^3*x^3+3*A^2*a^2*b*c^2*d*g^3*i^3*x^3+A^2*a^3*c*d^2*g^3*i^3*x^3+3*A*B*a^2*b*c^3*g^3*i^3*x^2*\log(e*(b*x/(d*x+c)+a/(d*x+c))^n)+3*A*B*a^3*c^2*d*g^3*i^3*x^2*\log(e*(b*x/(d*x+c)+a/(d*x+c))^n)+3/2*A^2*a^2*b*c^3*g^3*i^3*x^2+3/2*A^2*a^3*c^2*d*g^3*i^3*x^2+1/210*A*B*b^3*d^3*g^3*i^3*n*(60*a^7*\log(b*x+a)/b^7-60*c^7*\log(d*x+c)/d^7-(10*(b^6*c*d^5-a*b^5*d^6)*x^6-12*(b^6*c^2*d^4-a^2*b^4*d^6)*x^5+15*(b^6*c^3*d^3-a^3*b^3*d^6)*x^4-20*(b^6*c^4*d^2-a^4*b^2*d^6)*x^3+30*(b^6*c^5*d-a^5*b*d^6)*x^2-60*(b^6*c^6-a^6*d^6)*x)/(b^6*d^6))-1/60*A*B*b^3*c*d^2*g^3*i^3*n*(60*a^6*\log(b*x+a)/b^6-60*c^6*\log(d*x+c)/d^6+(12*(b^5*c*d^4-a*b^4*d^5)*x^5-15*(b^5*c^2*d^3-a^2*b^3*d^5)*x^4+20*(b^5*c^3*d^2-a^3*b^2*d^5)*x^3-30*(b^5*c^4*d-a^4*b*d^5)*x^2+60*(b^5*c^5-a^5*d^5)*x)/(b^5*d^5))-1/60*A*B*a*b^2*d^3*g^3*i^3*n*(60*a^6*\log(b*x+a)/b^6-60*c^6*\log(d*x+c)/d^6+(12*(b^5*c*d^4-a*b^4*d^5)*x^5-15*(b^5*c^2*d^3-a^2*b^3*d^5)*x^4+20*(b^5*c^3*d^2-a^3*b^2*d^5)*x^3-30*(b^5*c^4*d-a^4*b*d^5)*x^2+60*(b^5*c^5-a^5*d^5)*x)/(b^5*d^5))+1/10*A*B*b^3*c^2*d*g^3*i^3*n*(12*a^5*\log(b*x+a)/b^5-12*c^5*\log(d*x+c)/d^5-(3*(b^4*c*d^3-a*b^3*d^4)*x^4-4*(b^4*c^2*d^2-a^2*b^2*d^4)*x^3+6*(b^4*c^3*d-a^3*b*d^4)*x^2-12*(b^4*c^4-a^4*d^4)*x)/(b^4*d^4))+3/10*A*B*a*b^2*c*d^2*g^3*i^3*n*(12*a^5*\log(b*x+a)/b^5-12*c^5*\log(d*x+c)/d^5-(3*(b^4*c*d^3-a*b^3*d^4)*x^4-4*(b^4*c^2*d^2-a^2*b^2*d^4)*x^3+6*(b^4*c^3*d-a^3*b*d^4)*x^2-12*(b^4*c^4-a^4*d^4)*x)/(b^4*d^4))+1/10*A*B*a^2*b*d^3*g^3*i^3*n*(12*a^5*\log(b*x+a)/b^5-12*c^5*\log(d*x+c)/d^5-(3*(b^4*c*d^3-a*b^3*d^4)*x^4-4*(b^4*c^2*d^2-a^2*b^2*d^4)*x^3+6*(b^4*c^3*d-a^3*b*d^4)*x^2-12*(b^4*c^4-a^4*d^4)*x)/(b^4*d^4))-1/12*A*B*b^3*c^3*g^3*i^3*n*(6*a^4*\log(b*x+a)/b^4-6*c^4*\log(d*x+c)/d^4-(3*(b^3*c*d^2-a*b^2*d^3)*x^3-4*(b^3*c^2*d-a^2*b*d^2)*x^2+6*(b^3*c^3*d-a^3*d^3)*x)/(b^3*d^3))-1/12*A*B*a*b^2*c^2*d*g^3*i^3*n*(6*a^4*\log(b*x+a)/b^4-6*c^4*\log(d*x+c)/d^4+(12*(b^3*c*d^2-a*b^2*d^3)*x^3-4*(b^3*c^2*d-a^2*b*d^2)*x^2+6*(b^3*c^3*d-a^3*d^3)*x)/(b^3*d^3))-1/12*A*B*a^2*b*c*d^2*g^3*i^3*n*(6*a^4*\log(b*x+a)/b^4-6*c^4*\log(d*x+c)/d^4+(12*(b^3*c*d^2-a*b^2*d^3)*x^3-4*(b^3*c^2*d-a^2*b*d^2)*x^2+6*(b^3*c^3*d-a^3*d^3)*x)/(b^3*d^3))-1/12*A*B*a^3*d^2*g^3*i^3*n*(6*a^4*\log(b*x+a)/b^4-6*c^4*\log(d*x+c)/d^4+(12*(b^3*c*d^2-a*b^2*d^3)*x^3-4*(b^3*c^2*d-a^2*b*d^2)*x^2+6*(b^3*c^3*d-a^3*d^3)*x)/(b^3*d^3))$

$$\begin{aligned}
& dx + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x \\
& ^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) - 3/4*A*B*a*b^2*c^2*d*g^3*i^3*n*(6 \\
& *a^4*log(b*x + a)/b^4 - 6*c^4*log(dx + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3) \\
& *x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) \\
& - 3/4*A*B*a^2*b*c*d^2*g^3*i^3*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(dx + c \\
& )/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6* \\
& (b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) - 1/12*A*B*a^3*d^3*g^3*i^3*n*(6*a^4*log(b \\
& *x + a)/b^4 - 6*c^4*log(dx + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*( \\
& b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + A*B*a*b^ \\
& 2*c^3*g^3*i^3*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(dx + c)/d^3 - ((b^2*c* \\
& d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) + 3*A*B*a^2*b*c^2*d* \\
& g^3*i^3*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(dx + c)/d^3 - ((b^2*c*d - a* \\
& b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) + A*B*a^3*c*d^2*g^3*i^3*n* \\
& (2*a^3*log(b*x + a)/b^3 - 2*c^3*log(dx + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 \\
& - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 3*A*B*a^2*b*c^3*g^3*i^3*n*(a^2*log \\
& (b*x + a)/b^2 - c^2*log(dx + c)/d^2 + (b*c - a*d)*x/(b*d)) - 3*A*B*a^3*c^2 \\
& *d*g^3*i^3*n*(a^2*log(b*x + a)/b^2 - c^2*log(dx + c)/d^2 + (b*c - a*d)*x/( \\
& b*d)) + 2*A*B*a^3*c^3*g^3*i^3*n*(a*log(b*x + a)/b - c*log(dx + c)/d) + 2*A \\
& *B*a^3*c^3*g^3*i^3*x*log(e*(b*x/(dx + c) + a/(dx + c))^n) + A^2*a^3*c^3*g \\
& ^3*i^3*x - 1/420*(107*a^4*b^2*c^3*d^4*g^3*i^3*n^2 - 39*a^5*b*c^2*d^5*g^3*i^ \\
& 3*n^2 + 6*a^6*c*d^6*g^3*i^3*n^2 - 6*b^6*c^7*g^3*i^3*n*log(e) - 6*(g^3*i^3*n \\
& ^2 - 7*g^3*i^3*n*log(e))*a*b^5*c^6*d + 3*(13*g^3*i^3*n^2 - 42*g^3*i^3*n*log \\
& (e))*a^2*b^4*c^5*d^2 - (107*g^3*i^3*n^2 - 210*g^3*i^3*n*log(e))*a^3*b^3*c^4 \\
& *d^3)*B^2*log(dx + c)/(b^3*d^4) + 1/70*(b^7*c^7*g^3*i^3*n^2 - 7*a*b^6*c^6* \\
& d*g^3*i^3*n^2 + 21*a^2*b^5*c^5*d^2*g^3*i^3*n^2 - 35*a^3*b^4*c^4*d^3*g^3*i^3 \\
& *n^2 + 35*a^4*b^3*c^3*d^4*g^3*i^3*n^2 - 21*a^5*b^2*c^2*d^5*g^3*i^3*n^2 + 7* \\
& a^6*b*c*d^6*g^3*i^3*n^2 - a^7*d^7*g^3*i^3*n^2)*(log(b*x + a)*log((b*d*x + a \\
& *d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^4*d^4) + 1 \\
& /2520*(360*B^2*b^7*d^7*g^3*i^3*x^7*log(e)^2 - 60*((2*g^3*i^3*n*log(e) - 21* \\
& g^3*i^3*log(e)^2)*b^7*c*d^6 - (2*g^3*i^3*n*log(e) + 21*g^3*i^3*log(e)^2)*a* \\
& b^6*d^7)*B^2*x^6 + 24*((g^3*i^3*n^2 - 15*g^3*i^3*n*log(e) + 63*g^3*i^3*log \\
& (e)^2)*b^7*c^2*d^5 - (2*g^3*i^3*n^2 - 189*g^3*i^3*log(e)^2)*a*b^6*c*d^6 + (g \\
& ^3*i^3*n^2 + 15*g^3*i^3*n*log(e) + 63*g^3*i^3*log(e)^2)*a^2*b^5*d^7)*B^2*x^ \\
& 5 + 6*((10*g^3*i^3*n^2 - 51*g^3*i^3*n*log(e) + 105*g^3*i^3*log(e)^2)*b^7*c^ \\
& 3*d^4 - (10*g^3*i^3*n^2 + 147*g^3*i^3*n*log(e) - 945*g^3*i^3*log(e)^2)*a*b^ \\
& 6*c^2*d^5 - (10*g^3*i^3*n^2 - 147*g^3*i^3*n*log(e) - 945*g^3*i^3*log(e)^2)* \\
& a^2*b^5*c*d^6 + (10*g^3*i^3*n^2 + 51*g^3*i^3*n*log(e) + 105*g^3*i^3*log(e)^ \\
& 2)*a^3*b^4*d^7)*B^2*x^4 + 2*((11*g^3*i^3*n^2 - 6*g^3*i^3*n*log(e))*b^7*c^4* \\
& d^3 + 4*(19*g^3*i^3*n^2 - 147*g^3*i^3*n*log(e) + 315*g^3*i^3*log(e)^2)*a*b^ \\
& 6*c^3*d^4 - 6*(29*g^3*i^3*n^2 - 630*g^3*i^3*log(e)^2)*a^2*b^5*c^2*d^5 + 4*( \\
& 19*g^3*i^3*n^2 + 147*g^3*i^3*n*log(e) + 315*g^3*i^3*log(e)^2)*a^3*b^4*c*d^6 \\
& + (11*g^3*i^3*n^2 + 6*g^3*i^3*n*log(e))*a^4*b^3*d^7)*B^2*x^3 - 3*(3*(3*g^3 \\
& *i^3*n^2 - 2*g^3*i^3*n*log(e))*b^7*c^5*d^2 - (67*g^3*i^3*n^2 - 42*g^3*i^3*n \\
& *log(e))*a*b^6*c^4*d^3 + 2*(29*g^3*i^3*n^2 + 252*g^3*i^3*n*log(e) - 630*g^3 \\
& *i^3*log(e)^2)*a^2*b^5*c^3*d^4 + 2*(29*g^3*i^3*n^2 - 252*g^3*i^3*n*log(e) -
\end{aligned}$$



$$\begin{aligned} &^3*d^4*g^3*i^3*\log(e))*B^2*x + 6*(35*a^4*b^3*c^3*d^4*g^3*i^3*n - 21*a^5*b^2 \\ &*c^2*d^5*g^3*i^3*n + 7*a^6*b*c*d^6*g^3*i^3*n - a^7*d^7*g^3*i^3*n)*B^2*\log(b \\ &*x + a) + 6*(b^7*c^7*g^3*i^3*n - 7*a*b^6*c^6*d*g^3*i^3*n + 21*a^2*b^5*c^5*d \\ &^2*g^3*i^3*n - 35*a^3*b^4*c^4*d^3*g^3*i^3*n)*B^2*\log(d*x + c))*\log((b*x + a \\ &)^n) - 6*(120*B^2*b^7*d^7*g^3*i^3*x^7*\log(e) - 20*((g^3*i^3*n - 21*g^3*i^3* \\ &\log(e))*b^7*c*d^6 - (g^3*i^3*n + 21*g^3*i^3*\log(e))*a*b^6*d^7)*B^2*x^6 + 12 \\ &*(126*a*b^6*c*d^6*g^3*i^3*\log(e) - (5*g^3*i^3*n - 42*g^3*i^3*\log(e))*b^7*c^ \\ &2*d^5 + (5*g^3*i^3*n + 42*g^3*i^3*\log(e))*a^2*b^5*d^7)*B^2*x^5 - 3*((17*g^3 \\ &*i^3*n - 70*g^3*i^3*\log(e))*b^7*c^3*d^4 + 7*(7*g^3*i^3*n - 90*g^3*i^3*\log(e) \\ &))*a*b^6*c^2*d^5 - 7*(7*g^3*i^3*n + 90*g^3*i^3*\log(e))*a^2*b^5*c*d^6 - (17* \\ &g^3*i^3*n + 70*g^3*i^3*\log(e))*a^3*b^4*d^7)*B^2*x^4 - 2*(b^7*c^4*d^3*g^3*i^ \\ &3*n - a^4*b^3*d^7*g^3*i^3*n - 1260*a^2*b^5*c^2*d^5*g^3*i^3*\log(e) + 14*(7*g^ \\ &^3*i^3*n - 30*g^3*i^3*\log(e))*a*b^6*c^3*d^4 - 14*(7*g^3*i^3*n + 30*g^3*i^3* \\ &\log(e))*a^3*b^4*c*d^6)*B^2*x^3 + 3*(b^7*c^5*d^2*g^3*i^3*n - 7*a*b^6*c^4*d^3 \\ &*g^3*i^3*n + 7*a^4*b^3*c*d^6*g^3*i^3*n - a^5*b^2*d^7*g^3*i^3*n - 84*(g^3*i^ \\ &3*n - 5*g^3*i^3*\log(e))*a^2*b^5*c^3*d^4 + 84*(g^3*i^3*n + 5*g^3*i^3*\log(e) \\ &)*a^3*b^4*c^2*d^5)*B^2*x^2 - 6*(b^7*c^6*d*g^3*i^3*n - 7*a*b^6*c^5*d^2*g^3*i^ \\ &3*n + 21*a^2*b^5*c^4*d^3*g^3*i^3*n - 21*a^4*b^3*c^2*d^5*g^3*i^3*n + 7*a^5*b \\ &^2*c*d^6*g^3*i^3*n - a^6*b*d^7*g^3*i^3*n - 140*a^3*b^4*c^3*d^4*g^3*i^3*\log(e) \\ &)*B^2*x + 6*(35*a^4*b^3*c^3*d^4*g^3*i^3*n - 21*a^5*b^2*c^2*d^5*g^3*i^3*n \\ &+ 7*a^6*b*c*d^6*g^3*i^3*n - a^7*d^7*g^3*i^3*n)*B^2*\log(b*x + a) + 6*(b^7*c^ \\ &7*g^3*i^3*n - 7*a*b^6*c^6*d*g^3*i^3*n + 21*a^2*b^5*c^5*d^2*g^3*i^3*n - 35*a \\ &^3*b^4*c^4*d^3*g^3*i^3*n)*B^2*\log(d*x + c) + 6*(20*B^2*b^7*d^7*g^3*i^3*x^7 \\ &+ 140*B^2*a^3*b^4*c^3*d^4*g^3*i^3*x + 70*(b^7*c*d^6*g^3*i^3 + a*b^6*d^7*g^3 \\ &*i^3)*B^2*x^6 + 84*(b^7*c^2*d^5*g^3*i^3 + 3*a*b^6*c*d^6*g^3*i^3 + a^2*b^5*d \\ &^7*g^3*i^3)*B^2*x^5 + 35*(b^7*c^3*d^4*g^3*i^3 + 9*a*b^6*c^2*d^5*g^3*i^3 + 9 \\ &*a^2*b^5*c*d^6*g^3*i^3 + a^3*b^4*d^7*g^3*i^3)*B^2*x^4 + 140*(a*b^6*c^3*d^4* \\ &g^3*i^3 + 3*a^2*b^5*c^2*d^5*g^3*i^3 + a^3*b^4*c*d^6*g^3*i^3)*B^2*x^3 + 210* \\ &(a^2*b^5*c^3*d^4*g^3*i^3 + a^3*b^4*c^2*d^5*g^3*i^3)*B^2*x^2)*\log((b*x + a)^ \\ &n))*\log((d*x + c)^n))/(b^4*d^4) \end{aligned}$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( A^2 b^3 d^3 g^3 i^3 x^6 + A^2 a^3 c^3 g^3 i^3 + 3 (A^2 b^3 c d^2 + A^2 a b^2 d^3) g^3 i^3 x^5 + 3 (A^2 b^3 c^2 d + 3 A^2 a b^2 c d^2 + A^2 a^2 b d^3) g^3 i^3 x^4 + \dots \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x,
algorithm="fricas")
```

```
[Out] integral(A^2*b^3*d^3*g^3*i^3*x^6 + A^2*a^3*c^3*g^3*i^3 + 3*(A^2*b^3*c*d^2 +
```

$$\begin{aligned}
& A^2 a b^2 d^3 g^3 i^3 x^5 + 3(A^2 b^3 c^2 d + 3A^2 a b^2 c d^2 + A^2 a^2 b^3 d^3) g^3 i^3 x^4 + (A^2 b^3 c^3 + 9A^2 a b^2 c^2 d + 9A^2 a^2 b^3 c d^2 \\
& + A^2 a^3 d^3) g^3 i^3 x^3 + 3(A^2 a b^2 c^3 + 3A^2 a^2 b^3 c^2 d + A^2 a^3 c^3 d^2) g^3 i^3 x^2 + 3(A^2 a^2 b^3 c^3 + A^2 a^3 c^2 d) g^3 i^3 x + (B^2 b^3 d^3 g^3 i^3 x^6 + B^2 a^3 c^3 g^3 i^3 \\
& + 3(B^2 b^3 c^3 d^2 + B^2 a b^2 d^3) g^3 i^3 x^5 + 3(B^2 b^3 c^2 d + 3B^2 a b^2 c d^2 + B^2 a^2 b^3 d^3) g^3 i^3 x^4 + (B^2 b^3 c^3 + 9B^2 a b^2 c^2 d + 9B^2 a^2 b^3 c d^2 + B^2 a^3 d^3) \\
& g^3 i^3 x^3 + 3(B^2 a b^2 c^3 + 3B^2 a^2 b^3 c^2 d + B^2 a^3 c^3 d^2) g^3 i^3 x^2 + 3(B^2 a^2 b^3 c^3 + B^2 a^3 c^2 d) g^3 i^3 x) \log(e((b x + a)/(d x + c))^n)^2 + 2(A B b^3 d^3 g^3 i^3 x^6 + A B a^3 c^3 g^3 i^3 \\
& + 3(A B b^3 c^3 d^2 + A B a b^2 d^3) g^3 i^3 x^5 + 3(A B b^3 c^2 d + 3A B a b^2 c d^2 + A B a^2 b^3 d^3) g^3 i^3 x^4 + (A B b^3 c^3 + 9A B a b^2 c^2 d + 9A B a^2 b^3 c d^2 + A B a^3 d^3) g^3 i^3 x^3 + 3(A B a b^2 c^3 + 3A B a^2 b^3 c^2 d + A B a^3 c^3 d^2) g^3 i^3 x^2 + 3(A B a^2 b^3 c^3 + A B a^3 c^2 d) g^3 i^3 x) \log(e((b x + a)/(d x + c))^n), x)
\end{aligned}$$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*\*3\*(d\*i\*x+c\*i)\*\*3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n))\*\*2, x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int (bgx + ag)^3 (dix + ci)^3 \left( B \log \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) + A \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(d\*i\*x+c\*i)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2, x, algorithm="giac")

[Out] integrate((b\*g\*x + a\*g)^3\*(d\*i\*x + c\*i)^3\*(B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)^2, x)

$$3.179 \quad \int (ag+bgx)^2(ci+dix)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx$$

**Optimal.** Leaf size=976

$$\frac{Bg^2i^3n \left( 2A + 3Bn + 2B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) \log \left( \frac{bc-ad}{b(c+dx)} \right) (bc-ad)^6}{60b^4d^3} + \frac{B^2g^2i^3n^2 \log \left( \frac{a+bx}{c+dx} \right) (bc-ad)^6}{36b^4d^3} + \frac{11B^2g^2i^3n^2 \log(c+dx)}{180b^4d^3}$$

[Out]  $(-7*B^2*(b*c - a*d)^5*g^2*i^3*n^2*x)/(180*b^3*d^2) - (7*B^2*(b*c - a*d)^4*g^2*i^3*n^2*(c + d*x)^2)/(360*b^2*d^3) - (B^2*(b*c - a*d)^3*g^2*i^3*n^2*(c + d*x)^3)/(60*b*d^3) + (B^2*(b*c - a*d)^2*g^2*i^3*n^2*(c + d*x)^4)/(60*d^3) - (B*(b*c - a*d)^4*g^2*i^3*n*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(60*b^4*d) - (B*(b*c - a*d)^3*g^2*i^3*n*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(30*b^4) - (B*(b*c - a*d)^4*g^2*i^3*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(10*b^2*d^3) + (B*(b*c - a*d)^3*g^2*i^3*n*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(45*b*d^3) + (7*B*(b*c - a*d)^2*g^2*i^3*n*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(60*d^3) - (b*B*(b*c - a*d)*g^2*i^3*n*(c + d*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(15*d^3) + ((b*c - a*d)^3*g^2*i^3*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(60*b^4) + ((b*c - a*d)^2*g^2*i^3*(a + b*x)^3*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(20*b^3) + ((b*c - a*d)*g^2*i^3*(a + b*x)^3*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(10*b^2) + (g^2*i^3*(a + b*x)^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(6*b) + (B*(b*c - a*d)^5*g^2*i^3*n*(a + b*x)*(2*A + B*n + 2*B*Log[e*((a + b*x)/(c + d*x))^n])/(60*b^4*d^2) + (B*(b*c - a*d)^6*g^2*i^3*n*(2*A + 3*B*n + 2*B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(60*b^4*d^3) + (B^2*(b*c - a*d)^6*g^2*i^3*n^2*Log[(a + b*x)/(c + d*x)])/(36*b^4*d^3) + (11*B^2*(b*c - a*d)^6*g^2*i^3*n^2*Log[c + d*x])/(180*b^4*d^3) + (B^2*(b*c - a*d)^6*g^2*i^3*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(30*b^4*d^3)$

**Rubi [A]** time = 3.19829, antiderivative size = 886, normalized size of antiderivative = 0.91, number of steps used = 83, number of rules used = 13, integrand size = 45,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.289$ , Rules used = {2528, 2525, 12, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 43}

$$\frac{B^2g^2i^3n^2 \log^2(a+bx)(bc-ad)^6}{60b^4d^3} - \frac{B^2g^2i^3n^2 \log(a+bx)(bc-ad)^6}{45b^4d^3} - \frac{Bg^2i^3n \log(a+bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) (bc-ad)}{30b^4d^3}$$

Antiderivative was successfully verified.



[In] Int[(a\*g + b\*g\*x)^2\*(c\*i + d\*i\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2,x]

[Out] 
$$-(A*B*(b*c - a*d)^5*g^2*i^3*n*x)/(30*b^3*d^2) - (B^2*(b*c - a*d)^5*g^2*i^3*n^2*x)/(45*b^3*d^2) - (7*B^2*(b*c - a*d)^4*g^2*i^3*n^2*(c + d*x)^2)/(360*b^2*d^3) - (B^2*(b*c - a*d)^3*g^2*i^3*n^2*(c + d*x)^3)/(60*b*d^3) + (B^2*(b*c - a*d)^2*g^2*i^3*n^2*(c + d*x)^4)/(60*d^3) - (B^2*(b*c - a*d)^6*g^2*i^3*n^2*Log[a + b*x])/(45*b^4*d^3) + (B^2*(b*c - a*d)^6*g^2*i^3*n^2*Log[a + b*x]^2)/(60*b^4*d^3) - (B^2*(b*c - a*d)^5*g^2*i^3*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(30*b^4*d^2) - (B*(b*c - a*d)^4*g^2*i^3*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(60*b^2*d^3) - (B*(b*c - a*d)^3*g^2*i^3*n*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(90*b*d^3) + (7*B*(b*c - a*d)^2*g^2*i^3*n*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(60*d^3) - (b*B*(b*c - a*d)*g^2*i^3*n*(c + d*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(15*d^3) - (B*(b*c - a*d)^6*g^2*i^3*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(30*b^4*d^3) + ((b*c - a*d)^2*g^2*i^3*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(4*d^3) - (2*b*(b*c - a*d)*g^2*i^3*(c + d*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(5*d^3) + (b^2*g^2*i^3*(c + d*x)^6*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(6*d^3) + (B^2*(b*c - a*d)^6*g^2*i^3*n^2*Log[c + d*x])/(30*b^4*d^3) - (B^2*(b*c - a*d)^6*g^2*i^3*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(30*b^4*d^3) - (B^2*(b*c - a*d)^6*g^2*i^3*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(30*b^4*d^3)$$

### Rule 2528

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*(RGx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

### Rule 2525

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*((d\_.) + (e\_.)\*(x\_))^(m\_.), x\_Symbol] := Simp[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^n)/(e\*(m + 1)), x] - Dist[(b\*n\*p)/(e\*(m + 1)), Int[SimplifyIntegrand[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

### Rule 12

Int[(a\_)\*(u\_), x\_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b\_)\*(v\_)] /; FreeQ[b, x]

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(n_), x_Symbol] := Simp[Log[RemoveContent[a + b*x, x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x]]/Rfx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(Rfx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, Rfx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[Rfx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
```

, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))])\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] := -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rule 43

Int[((a\_.) + (b\_.)\*(x\_)^(m\_.))\*((c\_.) + (d\_.)\*(x\_)^(n\_.)), x\_Symbol] := Int[ExpandIntegrand[(a + b\*x)^m\*(c + d\*x)^n, x], x] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b\*c - a\*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && LeQ[7\*m + 4\*n + 4, 0]) || LtQ[9\*m + 5\*(n + 1), 0] || GtQ[m + n + 2, 0])

### Rubi steps

$$\begin{aligned}
\int (179c + 179dx)^3 (ag + bgx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx &= \int \left( \frac{(-bc + ad)^2 g^2 (179c + 179dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{d^2} \right) dx \\
&= \frac{(b^2 g^2) \int (179c + 179dx)^5 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx}{32041 d^2} \\
&= \frac{5735339 (bc - ad)^2 g^2 (c + dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{4d^3} \\
&= \frac{5735339 (bc - ad)^2 g^2 (c + dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{4d^3} \\
&= \frac{5735339 (bc - ad)^2 g^2 (c + dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{4d^3} \\
&= \frac{5735339 (bc - ad)^2 g^2 (c + dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{4d^3} \\
&= \frac{5735339 (bc - ad)^2 g^2 (c + dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{4d^3} \\
&= -\frac{5735339 AB (bc - ad)^5 g^2 nx}{30b^3 d^2} - \frac{5735339 B (bc - ad)^4 g^2 n}{30b^3 d^2} \\
&= -\frac{5735339 AB (bc - ad)^5 g^2 nx}{30b^3 d^2} - \frac{5735339 B^2 (bc - ad)^5 g^2 n}{30b^3 d^2} \\
&= -\frac{5735339 AB (bc - ad)^5 g^2 nx}{30b^3 d^2} - \frac{5735339 B^2 (bc - ad)^5 g^2 n}{30b^3 d^2} \\
&= -\frac{5735339 AB (bc - ad)^5 g^2 nx}{30b^3 d^2} - \frac{5735339 B^2 (bc - ad)^5 g^2 n}{45b^3 d^2} \\
&= -\frac{5735339 AB (bc - ad)^5 g^2 nx}{30b^3 d^2} - \frac{5735339 B^2 (bc - ad)^5 g^2 n}{45b^3 d^2} \\
&= -\frac{5735339 AB (bc - ad)^5 g^2 nx}{30b^3 d^2} - \frac{5735339 B^2 (bc - ad)^5 g^2 n}{45b^3 d^2}
\end{aligned}$$

**Mathematica [A]** time = 1.41987, size = 1627, normalized size = 1.67

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))
]^n))^2,x]
```

```
[Out] (g^2*i^3*(15*(b*c - a*d)^2*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))]^n
))^2 - 24*b*(b*c - a*d)*(c + d*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))]^n)^2 - (5*B*(b*c
- a*d)^3*n*(6*A*b*d*(b*c - a*d)^2*x - 3*B*(b*c - a*d)^2*n*(b*d*x + (b*c -
a*d)*Log[a + b*x]) - B*(b*c - a*d)*n*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2
+ 2*(b*c - a*d)^2*Log[a + b*x]) + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[e*((a
+ b*x)/(c + d*x))^n] + 3*b^2*(b*c - a*d)*(c + d*x)^2*(A + B*Log[e*((a + b*x
)/(c + d*x))^n] + 2*b^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
+ 6*(b*c - a*d)^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 6*
B*(b*c - a*d)^3*n*Log[c + d*x] - 3*B*(b*c - a*d)^3*n*(Log[a + b*x]*(Log[a +
b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d])) - 2*PolyLog[2, (d*(a + b*x))/(-(b
*c) + a*d)]))/b^4 + (2*B*(b*c - a*d)^2*n*(24*A*b*d*(b*c - a*d)^3*x - 12*B*
(b*c - a*d)^3*n*(b*d*x + (b*c - a*d)*Log[a + b*x]) - 4*B*(b*c - a*d)^2*n*(2
*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b*c - a*d)^2*Log[a + b*x]) - B*(b
*c - a*d)*n*(6*b*d*(b*c - a*d)^2*x + 3*b^2*(b*c - a*d)*(c + d*x)^2 + 2*b^3*
(c + d*x)^3 + 6*(b*c - a*d)^3*Log[a + b*x]) + 24*B*d*(b*c - a*d)^3*(a + b*x
)*Log[e*((a + b*x)/(c + d*x))^n] + 12*b^2*(b*c - a*d)^2*(c + d*x)^2*(A + B*
Log[e*((a + b*x)/(c + d*x))^n]) + 8*b^3*(b*c - a*d)*(c + d*x)^3*(A + B*Log[
e*((a + b*x)/(c + d*x))^n]) + 6*b^4*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c
+ d*x))^n]) + 24*(b*c - a*d)^4*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*
x))^n]) - 24*B*(b*c - a*d)^4*n*Log[c + d*x] - 12*B*(b*c - a*d)^4*n*(Log[a +
b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d])) - 2*PolyLog[2, (d*(
a + b*x))/(-(b*c) + a*d)]))/b^4 - (B*(b*c - a*d)*n*(120*A*b*d*(b*c - a*d)^
4*x - 60*B*(b*c - a*d)^4*n*(b*d*x + (b*c - a*d)*Log[a + b*x]) - 20*B*(b*c -
a*d)^3*n*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b*c - a*d)^2*Log[a +
b*x]) - 5*B*(b*c - a*d)^2*n*(6*b*d*(b*c - a*d)^2*x + 3*b^2*(b*c - a*d)*(c +
d*x)^2 + 2*b^3*(c + d*x)^3 + 6*(b*c - a*d)^3*Log[a + b*x]) - 2*B*(b*c - a*
d)*n*(12*b*d*(b*c - a*d)^3*x + 6*b^2*(b*c - a*d)^2*(c + d*x)^2 + 4*b^3*(b*c
- a*d)*(c + d*x)^3 + 3*b^4*(c + d*x)^4 + 12*(b*c - a*d)^4*Log[a + b*x]) +
120*B*d*(b*c - a*d)^4*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] + 60*b^2*(b*c
- a*d)^3*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 40*b^3*(b*c
- a*d)^2*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 30*b^4*(b*c
- a*d)*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 24*b^5*(c + d*x
)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 120*(b*c - a*d)^5*Log[a + b*x]
*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 120*B*(b*c - a*d)^5*n*Log[c + d*x
```

] - 60\*B\*(b\*c - a\*d)^5\*n\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]) - 2\*PolyLog[2, (d\*(a + b\*x))/(-(b\*c) + a\*d)])))/(6\*b^4))/(60\*d^3)

**Maple [F]** time = 0.702, size = 0, normalized size = 0.

$$\int (bgx + ag)^2 (dix + ci)^3 \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)^3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2,x)

[Out] int((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)^3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2,x)

**Maxima [B]** time = 4.07046, size = 8007, normalized size = 8.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2,x,  
algorithm="maxima")

[Out] 1/3\*A\*B\*b^2\*d^3\*g^2\*i^3\*x^6\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n) + 1/6\*A^2\*b^2\*d^3\*g^2\*i^3\*x^6 + 6/5\*A\*B\*b^2\*c\*d^2\*g^2\*i^3\*x^5\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n) + 4/5\*A\*B\*a\*b\*d^3\*g^2\*i^3\*x^5\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n) + 3/5\*A^2\*b^2\*c\*d^2\*g^2\*i^3\*x^5 + 2/5\*A^2\*a\*b\*d^3\*g^2\*i^3\*x^5 + 3/2\*A\*B\*b^2\*c^2\*d\*g^2\*i^3\*x^4\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n) + 3\*A\*B\*a\*b\*c\*d^2\*g^2\*i^3\*x^4\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n) + 1/2\*A\*B\*a^2\*d^3\*g^2\*i^3\*x^4\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n) + 3/4\*A^2\*b^2\*c^2\*d\*g^2\*i^3\*x^4 + 3/2\*A^2\*a\*b\*c\*d^2\*g^2\*i^3\*x^4 + 1/4\*A^2\*a^2\*d^3\*g^2\*i^3\*x^4 + 2/3\*A\*B\*b^2\*c^3\*g^2\*i^3\*x^3\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n) + 4\*A\*B\*a\*b\*c^2\*d\*g^2\*i^3\*x^3\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n) + 2\*A\*B\*a^2\*c\*d^2\*g^2\*i^3\*x^3\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n) + 1/3\*A^2\*b^2\*c^3\*g^2\*i^3\*x^3 + 2\*A^2\*a\*b\*c^2\*d\*g^2\*i^3\*x^3 + A^2\*a^2\*c\*d^2\*g^2\*i^3\*x^3 + 2\*A\*B\*a\*b\*c^3\*g^2\*i^3\*x^2\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n) + 3\*A\*B\*a^2\*c^2\*d\*g^2\*i^3\*x^2\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n) + A^2\*a\*b\*c^3\*g^2\*i^3\*x^2 + 3/2\*A^2\*a^2\*c^2\*d\*g^2\*i^3\*x^2 - 1/180\*A\*B\*b^2\*d^3\*g^2\*i^3\*n\*(60\*

$$\begin{aligned}
& a^6 \log(bx + a)/b^6 - 60c^6 \log(dx + c)/d^6 + (12(b^5cd^4 - ab^4d^5) \\
& )x^5 - 15(b^5c^2d^3 - a^2b^3d^5)x^4 + 20(b^5c^3d^2 - a^3b^2d^5) \\
& *x^3 - 30(b^5c^4d - a^4b^1d^5)x^2 + 60(b^5c^5 - a^5d^5)x / (b^5d^5) \\
& ) + 1/10A*B*b^2*c*d^2*g^2*i^3*n*(12*a^5*\log(b*x + a)/b^5 - 12*c^5*\log(d*x \\
& + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x \\
& ^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x) / (b^4*d^4) + \\
& 1/15A*B*a*b*d^3*g^2*i^3*n*(12*a^5*\log(b*x + a)/b^5 - 12*c^5*\log(d*x + c)/ \\
& d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + \\
& 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x) / (b^4*d^4) - 1/4* \\
& A*B*b^2*c^2*d*g^2*i^3*n*(6*a^4*\log(b*x + a)/b^4 - 6*c^4*\log(d*x + c)/d^4 + \\
& (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 \\
& - a^3*d^3)*x) / (b^3*d^3) - 1/2A*B*a*b*c*d^2*g^2*i^3*n*(6*a^4*\log(b*x + a) \\
& /b^4 - 6*c^4*\log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2 \\
& *d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x) / (b^3*d^3)) - 1/12A*B*a^2*d^ \\
& 3*g^2*i^3*n*(6*a^4*\log(b*x + a)/b^4 - 6*c^4*\log(d*x + c)/d^4 + (2*(b^3*c*d^ \\
& 2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)* \\
& x) / (b^3*d^3)) + 1/3A*B*b^2*c^3*g^2*i^3*n*(2*a^3*\log(b*x + a)/b^3 - 2*c^3*1 \\
& \log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x) / (b^2* \\
& d^2)) + 2A*B*a*b*c^2*d*g^2*i^3*n*(2*a^3*\log(b*x + a)/b^3 - 2*c^3*\log(d*x + \\
& c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x) / (b^2*d^2)) + \\
& A*B*a^2*c*d^2*g^2*i^3*n*(2*a^3*\log(b*x + a)/b^3 - 2*c^3*\log(d*x + c)/d^3 - \\
& ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x) / (b^2*d^2)) - 2A*B*a*b* \\
& c^3*g^2*i^3*n*(a^2*\log(b*x + a)/b^2 - c^2*\log(d*x + c)/d^2 + (b*c - a*d)*x / \\
& (b*d)) - 3A*B*a^2*c^2*d*g^2*i^3*n*(a^2*\log(b*x + a)/b^2 - c^2*\log(d*x + c) \\
& /d^2 + (b*c - a*d)*x / (b*d)) + 2A*B*a^2*c^3*g^2*i^3*n*(a*\log(b*x + a)/b - c \\
& *\log(d*x + c)/d) + 2A*B*a^2*c^3*g^2*i^3*x*\log(e*(b*x/(d*x + c) + a/(d*x + \\
& c)))^n + A^2*a^2*c^3*g^2*i^3*x - 1/180*(74*a^3*b^2*c^3*d^3*g^2*i^3*n^2 - 33 \\
& *a^4*b*c^2*d^4*g^2*i^3*n^2 + 6*a^5*c*d^5*g^2*i^3*n^2 - 2*(g^2*i^3*n^2 - 3*g \\
& ^2*i^3*n*\log(e))*b^5*c^6 + 18*(g^2*i^3*n^2 - 2*g^2*i^3*n*\log(e))*a*b^4*c^5* \\
& d - 9*(7*g^2*i^3*n^2 - 10*g^2*i^3*n*\log(e))*a^2*b^3*c^4*d^2)*B^2*\log(d*x + \\
& c)/(b^3*d^3) - 1/30*(b^6*c^6*g^2*i^3*n^2 - 6*a*b^5*c^5*d*g^2*i^3*n^2 + 15*a \\
& ^2*b^4*c^4*d^2*g^2*i^3*n^2 - 20*a^3*b^3*c^3*d^3*g^2*i^3*n^2 + 15*a^4*b^2*c^ \\
& 2*d^4*g^2*i^3*n^2 - 6*a^5*b*c*d^5*g^2*i^3*n^2 + a^6*d^6*g^2*i^3*n^2)*(log(b \\
& *x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a \\
& d)))*B^2/(b^4*d^3) + 1/360*(60*B^2*b^6*d^6*g^2*i^3*x^6*\log(e)^2 - 24*((g^2* \\
& i^3*n*\log(e) - 9*g^2*i^3*\log(e)^2)*b^6*c*d^5 - (g^2*i^3*n*\log(e) + 6*g^2*i^ \\
& 3*\log(e)^2)*a*b^5*d^6)*B^2*x^5 + 6*((g^2*i^3*n^2 - 13*g^2*i^3*n*\log(e) + 45 \\
& *g^2*i^3*\log(e)^2)*b^6*c^2*d^4 - 2*(g^2*i^3*n^2 - 3*g^2*i^3*n*\log(e) - 45*g \\
& ^2*i^3*\log(e)^2)*a*b^5*c*d^5 + (g^2*i^3*n^2 + 7*g^2*i^3*n*\log(e) + 15*g^2*i \\
& ^3*\log(e)^2)*a^2*b^4*d^6)*B^2*x^4 + 2*((9*g^2*i^3*n^2 - 38*g^2*i^3*n*\log(e) \\
& + 60*g^2*i^3*\log(e)^2)*b^6*c^3*d^3 - 3*(5*g^2*i^3*n^2 + 14*g^2*i^3*n*\log(e) \\
& ) - 120*g^2*i^3*\log(e)^2)*a*b^5*c^2*d^4 + 3*(g^2*i^3*n^2 + 26*g^2*i^3*n*\log \\
& (e) + 60*g^2*i^3*\log(e)^2)*a^2*b^4*c*d^5 + (3*g^2*i^3*n^2 + 2*g^2*i^3*n*\log \\
& (e))*a^3*b^3*d^6)*B^2*x^3 + ((11*g^2*i^3*n^2 - 6*g^2*i^3*n*\log(e))*b^6*c^4* \\
& d^2 + 2*(5*g^2*i^3*n^2 - 102*g^2*i^3*n*\log(e) + 180*g^2*i^3*\log(e)^2)*a*b^5
\end{aligned}$$

$$\begin{aligned}
& *c^3*d^3 - 60*(g^2*i^3*n^2 - 3*g^2*i^3*n*\log(e) - 9*g^2*i^3*\log(e)^2)*a^2*b \\
& ^4*c^2*d^4 + 2*(23*g^2*i^3*n^2 + 18*g^2*i^3*n*\log(e))*a^3*b^3*c*d^5 - (7*g^ \\
& ^2*i^3*n^2 + 6*g^2*i^3*n*\log(e))*a^4*b^2*d^6)*B^2*x^2 - 6*(20*a^3*b^3*c^3*d^ \\
& ^3*g^2*i^3*n^2 - 15*a^4*b^2*c^2*d^4*g^2*i^3*n^2 + 6*a^5*b*c*d^5*g^2*i^3*n^2 \\
& - a^6*d^6*g^2*i^3*n^2)*B^2*\log(b*x + a)^2 + 12*(b^6*c^6*g^2*i^3*n^2 - 6*a*b \\
& ^5*c^5*d*g^2*i^3*n^2 + 15*a^2*b^4*c^4*d^2*g^2*i^3*n^2)*B^2*\log(b*x + a)*\log \\
& (d*x + c) - 6*(b^6*c^6*g^2*i^3*n^2 - 6*a*b^5*c^5*d*g^2*i^3*n^2 + 15*a^2*b^4 \\
& *c^4*d^2*g^2*i^3*n^2)*B^2*\log(d*x + c)^2 - 2*(2*(4*g^2*i^3*n^2 - 3*g^2*i^3* \\
& n*\log(e))*b^6*c^5*d - 3*(17*g^2*i^3*n^2 - 12*g^2*i^3*n*\log(e))*a*b^5*c^4*d^ \\
& ^2 + (97*g^2*i^3*n^2 + 30*g^2*i^3*n*\log(e) - 180*g^2*i^3*\log(e)^2)*a^2*b^4*c \\
& ^3*d^3 - (77*g^2*i^3*n^2 + 90*g^2*i^3*n*\log(e))*a^3*b^3*c^2*d^4 + 9*(3*g^2*i \\
& ^3*n^2 + 4*g^2*i^3*n*\log(e))*a^4*b^2*c*d^5 - 2*(2*g^2*i^3*n^2 + 3*g^2*i^3* \\
& n*\log(e))*a^5*b*d^6)*B^2*x + 2*(6*a*b^5*c^5*d*g^2*i^3*n^2 - 33*a^2*b^4*c^4* \\
& d^2*g^2*i^3*n^2 + 2*(17*g^2*i^3*n^2 + 60*g^2*i^3*n*\log(e))*a^3*b^3*c^3*d^3 \\
& - 3*(g^2*i^3*n^2 + 30*g^2*i^3*n*\log(e))*a^4*b^2*c^2*d^4 - 6*(g^2*i^3*n^2 - \\
& 6*g^2*i^3*n*\log(e))*a^5*b*c*d^5 + 2*(g^2*i^3*n^2 - 3*g^2*i^3*n*\log(e))*a^6* \\
& d^6)*B^2*\log(b*x + a) + 6*(10*B^2*b^6*d^6*g^2*i^3*x^6 + 60*B^2*a^2*b^4*c^3* \\
& d^3*g^2*i^3*x + 12*(3*b^6*c*d^5*g^2*i^3 + 2*a*b^5*d^6*g^2*i^3)*B^2*x^5 + 15 \\
& *(3*b^6*c^2*d^4*g^2*i^3 + 6*a*b^5*c*d^5*g^2*i^3 + a^2*b^4*d^6*g^2*i^3)*B^2* \\
& x^4 + 20*(b^6*c^3*d^3*g^2*i^3 + 6*a*b^5*c^2*d^4*g^2*i^3 + 3*a^2*b^4*c*d^5*g \\
& ^2*i^3)*B^2*x^3 + 30*(2*a*b^5*c^3*d^3*g^2*i^3 + 3*a^2*b^4*c^2*d^4*g^2*i^3)* \\
& B^2*x^2)*\log((b*x + a)^n)^2 + 6*(10*B^2*b^6*d^6*g^2*i^3*x^6 + 60*B^2*a^2*b^ \\
& ^4*c^3*d^3*g^2*i^3*x + 12*(3*b^6*c*d^5*g^2*i^3 + 2*a*b^5*d^6*g^2*i^3)*B^2*x^ \\
& ^5 + 15*(3*b^6*c^2*d^4*g^2*i^3 + 6*a*b^5*c*d^5*g^2*i^3 + a^2*b^4*d^6*g^2*i^3 \\
& )*B^2*x^4 + 20*(b^6*c^3*d^3*g^2*i^3 + 6*a*b^5*c^2*d^4*g^2*i^3 + 3*a^2*b^4*c \\
& *d^5*g^2*i^3)*B^2*x^3 + 30*(2*a*b^5*c^3*d^3*g^2*i^3 + 3*a^2*b^4*c^2*d^4*g^2 \\
& *i^3)*B^2*x^2)*\log((d*x + c)^n)^2 + 2*(60*B^2*b^6*d^6*g^2*i^3*x^6*\log(e) - \\
& 12*((g^2*i^3*n - 18*g^2*i^3*\log(e))*b^6*c*d^5 - (g^2*i^3*n + 12*g^2*i^3*\log \\
& (e))*a*b^5*d^6)*B^2*x^5 - 3*((13*g^2*i^3*n - 90*g^2*i^3*\log(e))*b^6*c^2*d^4 \\
& - 6*(g^2*i^3*n + 30*g^2*i^3*\log(e))*a*b^5*c*d^5 - (7*g^2*i^3*n + 30*g^2*i^ \\
& ^3*\log(e))*a^2*b^4*d^6)*B^2*x^4 + 2*(a^3*b^3*d^6*g^2*i^3*n - (19*g^2*i^3*n - \\
& 60*g^2*i^3*\log(e))*b^6*c^3*d^3 - 3*(7*g^2*i^3*n - 120*g^2*i^3*\log(e))*a*b^ \\
& ^5*c^2*d^4 + 3*(13*g^2*i^3*n + 60*g^2*i^3*\log(e))*a^2*b^4*c*d^5)*B^2*x^3 - 3 \\
& *(b^6*c^4*d^2*g^2*i^3*n - 6*a^3*b^3*c*d^5*g^2*i^3*n + a^4*b^2*d^6*g^2*i^3*n \\
& + 2*(17*g^2*i^3*n - 60*g^2*i^3*\log(e))*a*b^5*c^3*d^3 - 30*(g^2*i^3*n + 6*g \\
& ^2*i^3*\log(e))*a^2*b^4*c^2*d^4)*B^2*x^2 + 6*(b^6*c^5*d*g^2*i^3*n - 6*a*b^5* \\
& c^4*d^2*g^2*i^3*n + 15*a^3*b^3*c^2*d^4*g^2*i^3*n - 6*a^4*b^2*c*d^5*g^2*i^3* \\
& n + a^5*b*d^6*g^2*i^3*n - 5*(g^2*i^3*n - 12*g^2*i^3*\log(e))*a^2*b^4*c^3*d^3 \\
& )*B^2*x + 6*(20*a^3*b^3*c^3*d^3*g^2*i^3*n - 15*a^4*b^2*c^2*d^4*g^2*i^3*n + \\
& 6*a^5*b*c*d^5*g^2*i^3*n - a^6*d^6*g^2*i^3*n)*B^2*\log(b*x + a) - 6*(b^6*c^6* \\
& g^2*i^3*n - 6*a*b^5*c^5*d*g^2*i^3*n + 15*a^2*b^4*c^4*d^2*g^2*i^3*n)*B^2*\log \\
& (d*x + c))*\log((b*x + a)^n) - 2*(60*B^2*b^6*d^6*g^2*i^3*x^6*\log(e) - 12*((g \\
& ^2*i^3*n - 18*g^2*i^3*\log(e))*b^6*c*d^5 - (g^2*i^3*n + 12*g^2*i^3*\log(e))*a \\
& *b^5*d^6)*B^2*x^5 - 3*((13*g^2*i^3*n - 90*g^2*i^3*\log(e))*b^6*c^2*d^4 - 6*( \\
& g^2*i^3*n + 30*g^2*i^3*\log(e))*a*b^5*c*d^5 - (7*g^2*i^3*n + 30*g^2*i^3*\log(
\end{aligned}$$



e))\*a^2\*b^4\*d^6)\*B^2\*x^4 + 2\*(a^3\*b^3\*d^6\*g^2\*i^3\*n - (19\*g^2\*i^3\*n - 60\*g^2\*i^3\*log(e))\*b^6\*c^3\*d^3 - 3\*(7\*g^2\*i^3\*n - 120\*g^2\*i^3\*log(e))\*a\*b^5\*c^2\*d^4 + 3\*(13\*g^2\*i^3\*n + 60\*g^2\*i^3\*log(e))\*a^2\*b^4\*c\*d^5)\*B^2\*x^3 - 3\*(b^6\*c^4\*d^2\*g^2\*i^3\*n - 6\*a^3\*b^3\*c\*d^5\*g^2\*i^3\*n + a^4\*b^2\*d^6\*g^2\*i^3\*n + 2\*(17\*g^2\*i^3\*n - 60\*g^2\*i^3\*log(e))\*a\*b^5\*c^3\*d^3 - 30\*(g^2\*i^3\*n + 6\*g^2\*i^3\*log(e))\*a^2\*b^4\*c^2\*d^4)\*B^2\*x^2 + 6\*(b^6\*c^5\*d\*g^2\*i^3\*n - 6\*a\*b^5\*c^4\*d^2\*g^2\*i^3\*n + 15\*a^3\*b^3\*c^2\*d^4\*g^2\*i^3\*n - 6\*a^4\*b^2\*c\*d^5\*g^2\*i^3\*n + a^5\*b\*d^6\*g^2\*i^3\*n - 5\*(g^2\*i^3\*n - 12\*g^2\*i^3\*log(e))\*a^2\*b^4\*c^3\*d^3)\*B^2\*x + 6\*(20\*a^3\*b^3\*c^3\*d^3\*g^2\*i^3\*n - 15\*a^4\*b^2\*c^2\*d^4\*g^2\*i^3\*n + 6\*a^5\*b\*c\*d^5\*g^2\*i^3\*n - a^6\*d^6\*g^2\*i^3\*n)\*B^2\*log(b\*x + a) - 6\*(b^6\*c^6\*g^2\*i^3\*n - 6\*a\*b^5\*c^5\*d\*g^2\*i^3\*n + 15\*a^2\*b^4\*c^4\*d^2\*g^2\*i^3\*n)\*B^2\*log(d\*x + c) + 6\*(10\*B^2\*b^6\*d^6\*g^2\*i^3\*x^6 + 60\*B^2\*a^2\*b^4\*c^3\*d^3\*g^2\*i^3\*x + 12\*(3\*b^6\*c\*d^5\*g^2\*i^3 + 2\*a\*b^5\*d^6\*g^2\*i^3)\*B^2\*x^5 + 15\*(3\*b^6\*c^2\*d^4\*g^2\*i^3 + 6\*a\*b^5\*c\*d^5\*g^2\*i^3 + a^2\*b^4\*d^6\*g^2\*i^3)\*B^2\*x^4 + 20\*(b^6\*c^3\*d^3\*g^2\*i^3 + 6\*a\*b^5\*c^2\*d^4\*g^2\*i^3 + 3\*a^2\*b^4\*c\*d^5\*g^2\*i^3)\*B^2\*x^3 + 30\*(2\*a\*b^5\*c^3\*d^3\*g^2\*i^3 + 3\*a^2\*b^4\*c^2\*d^4\*g^2\*i^3)\*B^2\*x^2)\*log((b\*x + a)^n))\*log((d\*x + c)^n))/(b^4\*d^3)

**Fricas [F]** time = 0., size = 0, normalized size = 0.

integral( $A^2b^2d^3g^2i^3x^5 + A^2a^2c^3g^2i^3 + (3A^2b^2cd^2 + 2A^2abd^3)g^2i^3x^4 + (3A^2b^2c^2d + 6A^2abcd^2 + A^2a^2d^3)g^2i^3x^3 + (A^2b^2c^2d^2 + 2A^2abd^3)g^2i^3x^2 + (A^2b^2c^2d^2 + 2A^2abd^3)g^2i^3x + (A^2b^2c^2d^2 + 2A^2abd^3)g^2i^3 + (A^2b^2c^2d^2 + 2A^2abd^3)g^2i^3$ )

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(d\*i\*x+c\*i)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2,x,  
algorithm="fricas")

[Out] integral(A^2\*b^2\*d^3\*g^2\*i^3\*x^5 + A^2\*a^2\*c^3\*g^2\*i^3 + (3\*A^2\*b^2\*c\*d^2 + 2\*A^2\*a\*b\*d^3)\*g^2\*i^3\*x^4 + (3\*A^2\*b^2\*c^2\*d + 6\*A^2\*a\*b\*c\*d^2 + A^2\*a^2\*d^3)\*g^2\*i^3\*x^3 + (A^2\*b^2\*c^3 + 6\*A^2\*a\*b\*c^2\*d + 3\*A^2\*a^2\*c\*d^2)\*g^2\*i^3\*x^2 + (2\*A^2\*a\*b\*c^3 + 3\*A^2\*a^2\*c^2\*d)\*g^2\*i^3\*x + (B^2\*b^2\*d^3\*g^2\*i^3\*x^5 + B^2\*a^2\*c^3\*g^2\*i^3 + (3\*B^2\*b^2\*c\*d^2 + 2\*B^2\*a\*b\*d^3)\*g^2\*i^3\*x^4 + (3\*B^2\*b^2\*c^2\*d + 6\*B^2\*a\*b\*c\*d^2 + B^2\*a^2\*d^3)\*g^2\*i^3\*x^3 + (B^2\*b^2\*c^3 + 6\*B^2\*a\*b\*c^2\*d + 3\*B^2\*a^2\*c\*d^2)\*g^2\*i^3\*x^2 + (2\*B^2\*a\*b\*c^3 + 3\*B^2\*a^2\*c^2\*d)\*g^2\*i^3\*x)\*log(e\*((b\*x + a)/(d\*x + c))^n)^2 + 2\*(A\*B\*b^2\*d^3\*g^2\*i^3\*x^5 + A\*B\*a^2\*c^3\*g^2\*i^3 + (3\*A\*B\*b^2\*c\*d^2 + 2\*A\*B\*a\*b\*d^3)\*g^2\*i^3\*x^4 + (3\*A\*B\*b^2\*c^2\*d + 6\*A\*B\*a\*b\*c\*d^2 + A\*B\*a^2\*d^3)\*g^2\*i^3\*x^3 + (A\*B\*b^2\*c^3 + 6\*A\*B\*a\*b\*c^2\*d + 3\*A\*B\*a^2\*c\*d^2)\*g^2\*i^3\*x^2 + (2\*A\*B\*a\*b\*c^3 + 3\*A\*B\*a^2\*c^2\*d)\*g^2\*i^3\*x)\*log(e\*((b\*x + a)/(d\*x + c))^n), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2, x)
```

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int (bgx + ag)^2 (dix + ci)^3 \left( B \log \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) + A \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2, x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(d*i*x + c*i)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2, x)
```

$$3.180 \quad \int (ag+bgx)(ci+dix)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx$$

**Optimal.** Leaf size=786

$$\frac{B^2 g i^3 n^2 (bc - ad)^5 \text{PolyLog} \left( 2, \frac{d(a+bx)}{b(c+dx)} \right)}{10b^4 d^2} - \frac{B g i^3 n (bc - ad)^5 \log \left( \frac{bc - ad}{b(c+dx)} \right) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A + Bn \right)}{10b^4 d^2} + \frac{3B g i^3 n (c + dx)}{10b^4 d^2}$$

[Out]  $(B^2*(b*c - a*d)^4*g*i^3*n^2*x)/(60*b^3*d) + (B^2*(b*c - a*d)^3*g*i^3*n^2*(c + d*x)^2)/(30*b^2*d^2) + (B^2*(b*c - a*d)^2*g*i^3*n^2*(c + d*x)^3)/(30*b*d^2) - (B*(b*c - a*d)^4*g*i^3*n*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(10*b^4*d) - (B*(b*c - a*d)^3*g*i^3*n*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(10*b^4) + (3*B*(b*c - a*d)^3*g*i^3*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(20*b^2*d^2) + (B*(b*c - a*d)^2*g*i^3*n*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(30*b*d^2) - (B*(b*c - a*d)*g*i^3*n*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(10*d^2) + ((b*c - a*d)^3*g*i^3*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))^2/(20*b^4) + ((b*c - a*d)^2*g*i^3*(a + b*x)^2*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))^2/(10*b^3) + (3*(b*c - a*d)*g*i^3*(a + b*x)^2*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))^2/(20*b^2) + (g*i^3*(a + b*x)^2*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))^2/(5*b) - (B*(b*c - a*d)^5*g*i^3*n*(A + B*n + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x)))]/(10*b^4*d^2) - (B^2*(b*c - a*d)^5*g*i^3*n^2*Log[(a + b*x)/(c + d*x)])/(12*b^4*d^2) - (11*B^2*(b*c - a*d)^5*g*i^3*n^2*Log[c + d*x])/(60*b^4*d^2) - (B^2*(b*c - a*d)^5*g*i^3*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(10*b^4*d^2)$

**Rubi [A]** time = 1.92992, antiderivative size = 706, normalized size of antiderivative = 0.9, number of steps used = 52, number of rules used = 13, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.302$ , Rules used = {2528, 2525, 12, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 43}

$$\frac{B^2 g i^3 n^2 (bc - ad)^5 \text{PolyLog} \left( 2, -\frac{d(a+bx)}{bc-ad} \right)}{10b^4 d^2} + \frac{B g i^3 n (bc - ad)^5 \log(a + bx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{10b^4 d^2} + \frac{B g i^3 n (c + dx)^2 (bc - ad)}{10b^4 d^2}$$

Antiderivative was successfully verified.

[In] Int[(a\*g + b\*g\*x)\*(c\*i + d\*i\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2, x]

```
[Out] (A*B*(b*c - a*d)^4*g*i^3*n*x)/(10*b^3*d) + (B^2*(b*c - a*d)^4*g*i^3*n^2*x)/
(60*b^3*d) + (B^2*(b*c - a*d)^3*g*i^3*n^2*(c + d*x)^2)/(30*b^2*d^2) + (B^2*
(b*c - a*d)^2*g*i^3*n^2*(c + d*x)^3)/(30*b*d^2) + (B^2*(b*c - a*d)^5*g*i^3*
n^2*Log[a + b*x])/(60*b^4*d^2) - (B^2*(b*c - a*d)^5*g*i^3*n^2*Log[a + b*x]^
2)/(20*b^4*d^2) + (B^2*(b*c - a*d)^4*g*i^3*n*(a + b*x)*Log[e*((a + b*x)/(c
+ d*x))^n])/(10*b^4*d) + (B*(b*c - a*d)^3*g*i^3*n*(c + d*x)^2*(A + B*Log[e*
((a + b*x)/(c + d*x))^n]))/(20*b^2*d^2) + (B*(b*c - a*d)^2*g*i^3*n*(c + d*x
)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(30*b*d^2) - (B*(b*c - a*d)*g*i
^3*n*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(10*d^2) + (B*(b*c
- a*d)^5*g*i^3*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(10*
b^4*d^2) - ((b*c - a*d)*g*i^3*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x)
]^n))^2/(4*d^2) + (b*g*i^3*(c + d*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^
n])^2)/(5*d^2) - (B^2*(b*c - a*d)^5*g*i^3*n^2*Log[c + d*x])/(10*b^4*d^2) +
(B^2*(b*c - a*d)^5*g*i^3*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d]))/(
10*b^4*d^2) + (B^2*(b*c - a*d)^5*g*i^3*n^2*PolyLog[2, -((d*(a + b*x))/(b*c
- a*d))])/(10*b^4*d^2)
```

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^ (n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^ (n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.)
^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)
^q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q]^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
```

, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]

### Rule 31

Int[((a\_) + (b\_)\*(x\_))<sup>(-1)</sup>, x\_Symbol] := Simp[Log[RemoveContent[a + b\*x, x]]/b, x] /; FreeQ[{a, b}, x]

### Rule 2524

Int[((a\_) + Log[(c\_)\*(RFX\_)<sup>(p\_)</sup>]\*(b\_))<sup>(n\_)</sup>/((d\_) + (e\_)\*(x\_)), x\_Symbol] := Simp[(Log[d + e\*x]\*(a + b\*Log[c\*RFX<sup>p</sup>])<sup>n</sup>)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[d + e\*x]\*(a + b\*Log[c\*RFX<sup>p</sup>])<sup>(n - 1)</sup>\*D[RFX, x])/RFX, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0]

### Rule 2418

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_))<sup>(n\_)</sup>]\*(b\_))<sup>(p\_)</sup>\*RFX\_, x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)<sup>n</sup>])<sup>p</sup>, RFX, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFX, x] && IntegerQ[p]

### Rule 2390

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_))<sup>(n\_)</sup>]\*(b\_))<sup>(p\_)</sup>\*((f\_) + (g\_)\*(x\_))<sup>(q\_)</sup>, x\_Symbol] := Dist[1/e, Subst[Int[((f\*x)/d)<sup>q</sup>\*(a + b\*Log[c\*x<sup>n</sup>])<sup>p</sup>, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_) + Log[(c\_)\*(x\_)<sup>(n\_)</sup>]\*(b\_))/(x\_), x\_Symbol] := Simp[(a + b\*Log[c\*x<sup>n</sup>])<sup>2</sup>/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rule 2394

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_))<sup>(n\_)</sup>]\*(b\_))/((f\_) + (g\_)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)<sup>n</sup>])/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_))]\*(b\_))/((f\_) + (g\_)\*(x\_)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*

$(e*f - d*g), 0]$

### Rule 2391

$\text{Int}[\text{Log}[(c_.) * ((d_.) + (e_.) * (x_)^{(n_.)})] / (x_), x\_Symbol] \text{ :> } -\text{Simp}[\text{PolyLog}[2, -(c * e * x^n)] / n, x] \text{ /; FreeQ}\{c, d, e, n\}, x] \ \&\& \ \text{EqQ}[c * d, 1]$

### Rule 43

$\text{Int}[(a_.) + (b_.) * (x_)^{(m_.)} * ((c_.) + (d_.) * (x_)^{(n_.)}), x\_Symbol] \text{ :> Int}[\text{ExpandIntegrand}[(a + b * x)^m * (c + d * x)^n, x], x] \text{ /; FreeQ}\{a, b, c, d, n\}, x] \ \&\& \ \text{NeQ}[b * c - a * d, 0] \ \&\& \ \text{IGtQ}[m, 0] \ \&\& \ (\text{!IntegerQ}[n] \ || \ (\text{EqQ}[c, 0] \ \&\& \ \text{LeQ}[7 * m + 4 * n + 4, 0]) \ || \ \text{LtQ}[9 * m + 5 * (n + 1), 0] \ || \ \text{GtQ}[m + n + 2, 0])$

### Rubi steps

$$\begin{aligned}
\int (180c + 180dx)^3 (ag + bgx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx &= \int \left( \frac{(-bc + ad)g(180c + 180dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{d} \right) dx \\
&= \frac{(bg) \int (180c + 180dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx}{180d} + \dots \\
&= -\frac{1458000(bc - ad)g(c + dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{d^2} + \dots \\
&= -\frac{1458000(bc - ad)g(c + dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{d^2} + \dots \\
&= -\frac{1458000(bc - ad)g(c + dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{d^2} + \dots \\
&= -\frac{1458000(bc - ad)g(c + dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{d^2} + \dots \\
&= \frac{583200AB(bc - ad)^4 gnx}{b^3 d} + \frac{291600B(bc - ad)^3 gn(c + dx)}{b^2 d} + \dots \\
&= \frac{583200AB(bc - ad)^4 gnx}{b^3 d} + \frac{583200B^2(bc - ad)^4 gn(a + bx)}{b^4 d} + \dots \\
&= \frac{583200AB(bc - ad)^4 gnx}{b^3 d} + \frac{583200B^2(bc - ad)^4 gn(a + bx)}{b^4 d} + \dots \\
&= \frac{583200AB(bc - ad)^4 gnx}{b^3 d} + \frac{97200B^2(bc - ad)^4 gn^2 x}{b^3 d} + \dots \\
&= \frac{583200AB(bc - ad)^4 gnx}{b^3 d} + \frac{97200B^2(bc - ad)^4 gn^2 x}{b^3 d} + \dots \\
&= \frac{583200AB(bc - ad)^4 gnx}{b^3 d} + \frac{97200B^2(bc - ad)^4 gn^2 x}{b^3 d} + \dots
\end{aligned}$$

**Mathematica [A]** time = 0.726238, size = 945, normalized size = 1.2

$$gi^3 \left( 4b \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 (c+dx)^5 - 5(bc-ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 (c+dx)^4 + \frac{5B(bc-ad)^2 n \left( 6 \log(a+bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 \right)}{20d^2} \right)$$

Antiderivative was successfully verified.

[In] Integrate[(a\*g + b\*g\*x)\*(c\*i + d\*i\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2,x]

[Out] (g\*i^3\*(-5\*(b\*c - a\*d)\*(c + d\*x)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2 + 4\*b\*(c + d\*x)^5\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2 + (5\*B\*(b\*c - a\*d)^2\*n\*(6\*A\*b\*d\*(b\*c - a\*d)^2\*x - 3\*B\*(b\*c - a\*d)^2\*n\*(b\*d\*x + (b\*c - a\*d)\*Log[a + b\*x]) - B\*(b\*c - a\*d)\*n\*(2\*b\*d\*(b\*c - a\*d)\*x + b^2\*(c + d\*x)^2 + 2\*(b\*c - a\*d)^2\*Log[a + b\*x]) + 6\*B\*d\*(b\*c - a\*d)^2\*(a + b\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n] + 3\*b^2\*(b\*c - a\*d)\*(c + d\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 2\*b^3\*(c + d\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 6\*(b\*c - a\*d)^3\*Log[a + b\*x]\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 6\*B\*(b\*c - a\*d)^3\*n\*Log[c + d\*x] - 3\*B\*(b\*c - a\*d)^3\*n\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]) - 2\*PolyLog[2, (d\*(a + b\*x))/(-(b\*c + a\*d))]))/(3\*b^4) - (B\*(b\*c - a\*d)\*n\*(24\*A\*b\*d\*(b\*c - a\*d)^3\*x - 12\*B\*(b\*c - a\*d)^3\*n\*(b\*d\*x + (b\*c - a\*d)\*Log[a + b\*x]) - 4\*B\*(b\*c - a\*d)^2\*n\*(2\*b\*d\*(b\*c - a\*d)\*x + b^2\*(c + d\*x)^2 + 2\*(b\*c - a\*d)^2\*Log[a + b\*x]) - B\*(b\*c - a\*d)\*n\*(6\*b\*d\*(b\*c - a\*d)^2\*x + 3\*b^2\*(b\*c - a\*d)\*(c + d\*x)^2 + 2\*b^3\*(c + d\*x)^3 + 6\*(b\*c - a\*d)^3\*Log[a + b\*x]) + 24\*B\*d\*(b\*c - a\*d)^3\*(a + b\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n] + 12\*b^2\*(b\*c - a\*d)^2\*(c + d\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 8\*b^3\*(b\*c - a\*d)\*(c + d\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 6\*b^4\*(c + d\*x)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 24\*(b\*c - a\*d)^4\*Log[a + b\*x]\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 24\*B\*(b\*c - a\*d)^4\*n\*Log[c + d\*x] - 12\*B\*(b\*c - a\*d)^4\*n\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]) - 2\*PolyLog[2, (d\*(a + b\*x))/(-(b\*c + a\*d))]))/(3\*b^4)))/(20\*d^2)

**Maple [F]** time = 0.534, size = 0, normalized size = 0.

$$\int (bgx + ag)(dix + ci)^3 \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.



```
[In] int((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

**Maxima [B]** time = 4.63509, size = 5027, normalized size = 6.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, a
lgorithm="maxima")
```

```
[Out] 2/5*A*B*b*d^3*g*i^3*x^5*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/5*A^2*b*
d^3*g*i^3*x^5 + 3/2*A*B*b*c*d^2*g*i^3*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c
))^n) + 1/2*A*B*a*d^3*g*i^3*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/
4*A^2*b*c*d^2*g*i^3*x^4 + 1/4*A^2*a*d^3*g*i^3*x^4 + 2*A*B*b*c^2*d*g*i^3*x^3
*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 2*A*B*a*c*d^2*g*i^3*x^3*log(e*(b*
x/(d*x + c) + a/(d*x + c))^n) + A^2*b*c^2*d*g*i^3*x^3 + A^2*a*c*d^2*g*i^3*x
^3 + A*B*b*c^3*g*i^3*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3*A*B*a*c
^2*d*g*i^3*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/2*A^2*b*c^3*g*i^3
*x^2 + 3/2*A^2*a*c^2*d*g*i^3*x^2 + 1/30*A*B*b*d^3*g*i^3*n*(12*a^5*log(b*x +
a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4
*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 -
a^4*d^4)*x)/(b^4*d^4) - 1/4*A*B*b*c*d^2*g*i^3*n*(6*a^4*log(b*x + a)/b^4 -
6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a
^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3) - 1/12*A*B*a*d^3*g*i^3*
n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*
d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^
3) + A*B*b*c^2*d*g*i^3*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3
- ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2) + A*B*a*c*
d^2*g*i^3*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d -
a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2) - A*B*b*c^3*g*i^3*n*(a^2
*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) - 3*A*B*a*c
^2*d*g*i^3*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(
b*d)) + 2*A*B*a*c^3*g*i^3*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + 2*A*B*a
*c^3*g*i^3*x*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*a*c^3*g*i^3*x - 1
/60*(47*a^2*b^2*c^3*d^2*g*i^3*n^2 - 27*a^3*b*c^2*d^3*g*i^3*n^2 + 6*a^4*c*d^
4*g*i^3*n^2 + (5*g*i^3*n^2 - 6*g*i^3*n*log(e))*b^4*c^5 - (31*g*i^3*n^2 - 30
*g*i^3*n*log(e))*a*b^3*c^4*d)*B^2*log(d*x + c)/(b^3*d^2) + 1/10*(b^5*c^5*g*
i^3*n^2 - 5*a*b^4*c^4*d*g*i^3*n^2 + 10*a^2*b^3*c^3*d^2*g*i^3*n^2 - 10*a^3*b
^2*c^2*d^3*g*i^3*n^2 + 5*a^4*b*c*d^4*g*i^3*n^2 - a^5*d^5*g*i^3*n^2)*(log(b
```

$$\begin{aligned}
& x + a) * \log((b*d*x + a*d)/(b*c - a*d) + 1) + \operatorname{dilog}(-(b*d*x + a*d)/(b*c - a*d)) * B^2 / (b^4*d^2) + 1/60 * (12*B^2*b^5*d^5*g_i^3*x^5*\log(e)^2 - 3*((2*g_i^3*n * \log(e) - 15*g_i^3*\log(e)^2)*b^5*c*d^4 - (2*g_i^3*n*\log(e) + 5*g_i^3*\log(e)^2)*a*b^4*d^5)*B^2*x^4 + 2*((g_i^3*n^2 - 11*g_i^3*n*\log(e) + 30*g_i^3*\log(e)^2)*b^5*c^2*d^3 - 2*(g_i^3*n^2 - 5*g_i^3*n*\log(e) - 15*g_i^3*\log(e)^2)*a*b^4*c*d^4 + (g_i^3*n^2 + g_i^3*n*\log(e))*a^2*b^3*d^5)*B^2*x^3 + ((8*g_i^3*n^2 - 27*g_i^3*n*\log(e) + 30*g_i^3*\log(e)^2)*b^5*c^3*d^2 - 3*(6*g_i^3*n^2 - 5*g_i^3*n*\log(e) - 30*g_i^3*\log(e)^2)*a*b^4*c^2*d^3 + 3*(4*g_i^3*n^2 + 5*g_i^3*n*\log(e))*a^2*b^3*c*d^4 - (2*g_i^3*n^2 + 3*g_i^3*n*\log(e))*a^3*b^2*d^5)*B^2*x^2 - 3*(10*a^2*b^3*c^3*d^2*g_i^3*n^2 - 10*a^3*b^2*c^2*d^3*g_i^3*n^2 + 5*a^4*b*c*d^4*g_i^3*n^2 - a^5*d^5*g_i^3*n^2)*B^2*\log(b*x + a)^2 - 6*(b^5*c^5*g_i^3*n^2 - 5*a*b^4*c^4*d*g_i^3*n^2)*B^2*\log(d*x + c)^2 + ((11*g_i^3*n^2 - 6*g_i^3*n*\log(e))*b^5*c^4*d - 2*(14*g_i^3*n^2 + 15*g_i^3*n*\log(e) - 30*g_i^3*\log(e)^2)*a*b^4*c^3*d^2 + 12*(2*g_i^3*n^2 + 5*g_i^3*n*\log(e))*a^2*b^3*c^2*d^3 - 2*(4*g_i^3*n^2 + 15*g_i^3*n*\log(e))*a^3*b^2*c*d^4 + (g_i^3*n^2 + 6*g_i^3*n*\log(e))*a^4*b*d^5)*B^2*x - (6*a*b^4*c^4*d*g_i^3*n^2 + 3*(g_i^3*n^2 - 20*g_i^3*n*\log(e))*a^2*b^3*c^3*d^2 - (23*g_i^3*n^2 - 60*g_i^3*n*\log(e))*a^3*b^2*c^2*d^3 + (19*g_i^3*n^2 - 30*g_i^3*n*\log(e))*a^4*b*c*d^4 - (5*g_i^3*n^2 - 6*g_i^3*n*\log(e))*a^5*d^5)*B^2*\log(b*x + a) + 3*(4*B^2*b^5*d^5*g_i^3*x^5 + 20*B^2*a*b^4*c^3*d^2*g_i^3*x + 5*(3*b^5*c*d^4*g_i^3 + a*b^4*d^5*g_i^3)*B^2*x^4 + 20*(b^5*c^2*d^3*g_i^3 + a*b^4*c*d^4*g_i^3)*B^2*x^3 + 10*(b^5*c^3*d^2*g_i^3 + 3*a*b^4*c^2*d^3*g_i^3)*B^2*x^2)*\log((b*x + a)^n)^2 + 3*(4*B^2*b^5*d^5*g_i^3*x^5 + 20*B^2*a*b^4*c^3*d^2*g_i^3*x + 5*(3*b^5*c*d^4*g_i^3 + a*b^4*d^5*g_i^3)*B^2*x^4 + 20*(b^5*c^2*d^3*g_i^3 + a*b^4*c*d^4*g_i^3)*B^2*x^3 + 10*(b^5*c^3*d^2*g_i^3 + 3*a*b^4*c^2*d^3*g_i^3)*B^2*x^2)*\log((d*x + c)^n)^2 + (24*B^2*b^5*d^5*g_i^3*x^5*\log(e) - 6*((g_i^3*n - 15*g_i^3*\log(e))*b^5*c*d^4 - (g_i^3*n + 5*g_i^3*\log(e))*a*b^4*d^5)*B^2*x^4 + 2*(a^2*b^3*d^5*g_i^3*n - (11*g_i^3*n - 60*g_i^3*\log(e))*b^5*c^2*d^3 + 10*(g_i^3*n + 6*g_i^3*\log(e))*a*b^4*c*d^4)*B^2*x^3 + 3*(5*a^2*b^3*c*d^4*g_i^3*n - a^3*b^2*d^5*g_i^3*n - (9*g_i^3*n - 20*g_i^3*\log(e))*b^5*c^3*d^2 + 5*(g_i^3*n + 12*g_i^3*\log(e))*a*b^4*c^2*d^3)*B^2*x^2 - 6*(b^5*c^4*d*g_i^3*n - 10*a^2*b^3*c^2*d^3*g_i^3*n + 5*a^3*b^2*c*d^4*g_i^3*n - a^4*b*d^5*g_i^3*n + 5*(g_i^3*n - 4*g_i^3*\log(e))*a*b^4*c^3*d^2)*B^2*x + 6*(10*a^2*b^3*c^3*d^2*g_i^3*n - 10*a^3*b^2*c^2*d^3*g_i^3*n + 5*a^4*b*c*d^4*g_i^3*n - a^5*d^5*g_i^3*n)*B^2*\log(b*x + a) + 6*(b^5*c^5*g_i^3*n - 5*a*b^4*c^4*d*g_i^3*n)*B^2*\log(d*x + c))*\log((b*x + a)^n) - (24*B^2*b^5*d^5*g_i^3*x^5*\log(e) - 6*((g_i^3*n - 15*g_i^3*\log(e))*b^5*c*d^4 - (g_i^3*n + 5*g_i^3*\log(e))*a*b^4*d^5)*B^2*x^4 + 2*(a^2*b^3*d^5*g_i^3*n - (11*g_i^3*n - 60*g_i^3*\log(e))*b^5*c^2*d^3 + 10*(g_i^3*n + 6*g_i^3*\log(e))*a*b^4*c*d^4)*B^2*x^3 + 3*(5*a^2*b^3*c*d^4*g_i^3*n - a^3*b^2*d^5*g_i^3*n - (9*g_i^3*n - 20*g_i^3*\log(e))*b^5*c^3*d^2 + 5*(g_i^3*n + 12*g_i^3*\log(e))*a*b^4*c^2*d^3)*B^2*x^2 - 6*(b^5*c^4*d*g_i^3*n - 10*a^2*b^3*c^2*d^3*g_i^3*n + 5*a^3*b^2*c*d^4*g_i^3*n - a^4*b*d^5*g_i^3*n + 5*(g_i^3*n - 4*g_i^3*\log(e))*a*b^4*c^3*d^2)*B^2*x + 6*(10*a^2*b^3*c^3*d^2*g_i^3*n - 10*a^3*b^2*c^2*d^3*g_i^3*n + 5*a^4*b*c*d^4*g_i^3*n - a^5*d^5*g_i^3*n)*B^2*\log(b
\end{aligned}$$

$$x + a) + 6*(b^5*c^5*g*i^3*n - 5*a*b^4*c^4*d*g*i^3*n)*B^2*\log(d*x + c) + 6*(4*B^2*b^5*d^5*g*i^3*x^5 + 20*B^2*a*b^4*c^3*d^2*g*i^3*x + 5*(3*b^5*c*d^4*g*i^3 + a*b^4*d^5*g*i^3)*B^2*x^4 + 20*(b^5*c^2*d^3*g*i^3 + a*b^4*c*d^4*g*i^3)*B^2*x^3 + 10*(b^5*c^3*d^2*g*i^3 + 3*a*b^4*c^2*d^3*g*i^3)*B^2*x^2)*\log((b*x + a)^n)*\log((d*x + c)^n)/(b^4*d^2)$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( A^2 b d^3 g i^3 x^4 + A^2 a c^3 g i^3 + (3 A^2 b c d^2 + A^2 a d^3) g i^3 x^3 + 3 (A^2 b c^2 d + A^2 a c d^2) g i^3 x^2 + (A^2 b c^3 + 3 A^2 a c^2 d) g i^3 x + \dots \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2,x, a lgorithm="fricas")

[Out] integral(A^2\*b\*d^3\*g\*i^3\*x^4 + A^2\*a\*c^3\*g\*i^3 + (3\*A^2\*b\*c\*d^2 + A^2\*a\*d^3)\*g\*i^3\*x^3 + 3\*(A^2\*b\*c^2\*d + A^2\*a\*c\*d^2)\*g\*i^3\*x^2 + (A^2\*b\*c^3 + 3\*A^2\*a\*c^2\*d)\*g\*i^3\*x + (B^2\*b\*d^3\*g\*i^3\*x^4 + B^2\*a\*c^3\*g\*i^3 + (3\*B^2\*b\*c\*d^2 + B^2\*a\*d^3)\*g\*i^3\*x^3 + 3\*(B^2\*b\*c^2\*d + B^2\*a\*c\*d^2)\*g\*i^3\*x^2 + (B^2\*b\*c^3 + 3\*B^2\*a\*c^2\*d)\*g\*i^3\*x)\*log(e\*((b\*x + a)/(d\*x + c))^n)^2 + 2\*(A\*B\*b\*d^3\*g\*i^3\*x^4 + A\*B\*a\*c^3\*g\*i^3 + (3\*A\*B\*b\*c\*d^2 + A\*B\*a\*d^3)\*g\*i^3\*x^3 + 3\*(A\*B\*b\*c^2\*d + A\*B\*a\*c\*d^2)\*g\*i^3\*x^2 + (A\*B\*b\*c^3 + 3\*A\*B\*a\*c^2\*d)\*g\*i^3\*x)\*log(e\*((b\*x + a)/(d\*x + c))^n), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)\*\*3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c)\*\*n))\*\*2,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int (bgx + ag)(dix + ci)^3 \left( B \log \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) + A \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(d\*i\*x+c\*i)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2,x, algorithm="giac")

[Out] integrate((b\*g\*x + a\*g)\*(d\*i\*x + c\*i)^3\*(B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)^2, x)

$$3.181 \quad \int (ci + dix)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx$$

**Optimal.** Leaf size=454

$$\frac{B^2 i^3 n^2 (bc - ad)^4 \text{PolyLog} \left( 2, \frac{b(c+dx)}{d(a+bx)} \right)}{2b^4 d} + \frac{Bi^3 n (bc - ad)^4 \log \left( 1 - \frac{b(c+dx)}{d(a+bx)} \right) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{2b^4 d} - \frac{Bi^3 n (a + bx)(bc - ad)}{2b^4 d}$$

[Out] (5\*B^2\*(b\*c - a\*d)^3\*i^3\*n^2\*x)/(12\*b^3) + (B^2\*(b\*c - a\*d)^2\*i^3\*n^2\*(c + d\*x)^2)/(12\*b^2\*d) - (B\*(b\*c - a\*d)^3\*i^3\*n\*(a + b\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(2\*b^4) - (B\*(b\*c - a\*d)^2\*i^3\*n\*(c + d\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(4\*b^2\*d) - (B\*(b\*c - a\*d)\*i^3\*n\*(c + d\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(6\*b\*d) + (i^3\*(c + d\*x)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))^2/(4\*d) + (5\*B^2\*(b\*c - a\*d)^4\*i^3\*n^2\*Log[(a + b\*x)/(c + d\*x)])/(12\*b^4\*d) + (11\*B^2\*(b\*c - a\*d)^4\*i^3\*n^2\*Log[c + d\*x])/(12\*b^4\*d) + (B\*(b\*c - a\*d)^4\*i^3\*n\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[1 - (b\*(c + d\*x))/(d\*(a + b\*x))])/(2\*b^4\*d) - (B^2\*(b\*c - a\*d)^4\*i^3\*n^2\*PolyLog[2, (b\*(c + d\*x))/(d\*(a + b\*x))])/(2\*b^4\*d)

**Rubi [A]** time = 0.663842, antiderivative size = 544, normalized size of antiderivative = 1.2, number of steps used = 23, number of rules used = 13, integrand size = 35,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.371$ , Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 43}

$$\frac{B^2 i^3 n^2 (bc - ad)^4 \text{PolyLog} \left( 2, -\frac{d(a+bx)}{bc-ad} \right)}{2b^4 d} - \frac{Bi^3 n (bc - ad)^4 \log(a + bx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{2b^4 d} - \frac{Bi^3 n (c + dx)^2 (bc - ad)}{2b^4 d}$$

Antiderivative was successfully verified.

[In] Int[(c\*i + d\*i\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2,x]

[Out] -(A\*B\*(b\*c - a\*d)^3\*i^3\*n\*x)/(2\*b^3) + (5\*B^2\*(b\*c - a\*d)^3\*i^3\*n^2\*x)/(12\*b^3) + (B^2\*(b\*c - a\*d)^2\*i^3\*n^2\*(c + d\*x)^2)/(12\*b^2\*d) + (5\*B^2\*(b\*c - a\*d)^4\*i^3\*n^2\*Log[a + b\*x])/(12\*b^4\*d) + (B^2\*(b\*c - a\*d)^4\*i^3\*n^2\*Log[a + b\*x]^2)/(4\*b^4\*d) - (B^2\*(b\*c - a\*d)^3\*i^3\*n\*(a + b\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n])/(2\*b^4) - (B\*(b\*c - a\*d)^2\*i^3\*n\*(c + d\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(4\*b^2\*d) - (B\*(b\*c - a\*d)\*i^3\*n\*(c + d\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(6\*b\*d) - (B\*(b\*c - a\*d)^4\*i^3\*n\*Log[a + b\*x]\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(2\*b^4\*d) + (i^3\*(c + d\*x)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))^2/(4\*d)

$$+ B \cdot \text{Log}\left[\frac{e \cdot ((a + b \cdot x)/(c + d \cdot x))^n}{(4 \cdot d)} + (B^2 \cdot (b \cdot c - a \cdot d)^4 \cdot i^3 \cdot n^2 \cdot \text{Log}[c + d \cdot x]) / (2 \cdot b^4 \cdot d) - (B^2 \cdot (b \cdot c - a \cdot d)^4 \cdot i^3 \cdot n^2 \cdot \text{Log}[a + b \cdot x] \cdot \text{Log}[(b \cdot (c + d \cdot x))/(b \cdot c - a \cdot d)]) / (2 \cdot b^4 \cdot d) - (B^2 \cdot (b \cdot c - a \cdot d)^4 \cdot i^3 \cdot n^2 \cdot \text{PolyLog}[2, -(d \cdot (a + b \cdot x))/(b \cdot c - a \cdot d)]) / (2 \cdot b^4 \cdot d)\right]$$

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.))^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

### Rule 31

```
Int[((a_) + (b_.)*(x_))^(n_), x_Symbol] :> Simp[Log[RemoveContent[a + b*x, x]]/b, x] /; FreeQ[{a, b}, x]
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
```

FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

### Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*(RFx\_), x\_Symbol] :=> With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n]]^p, RFx, x]}, Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]

### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.)\*(x\_))^(q\_.), x\_Symbol] :=> Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] :=> Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :=> Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n]))/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))])\*(b\_.)/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :=> Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] :=> -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rule 43

Int[((a\_.) + (b\_.)\*(x\_))^(m\_.)\*((c\_.) + (d\_.)\*(x\_))^(n\_.), x\_Symbol] :=> Int[ExpandIntegrand[(a + b\*x)^m\*(c + d\*x)^n, x], x] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b\*c - a\*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && Le

Q[7\*m + 4\*n + 4, 0] || LtQ[9\*m + 5\*(n + 1), 0] || GtQ[m + n + 2, 0]

Rubi steps

$$\begin{aligned}
 \int (181c + 181dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx &= \frac{5929741(c+dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{4d} - \frac{(Bn) \int \frac{1073283121(bc-ad)}{\dots}}{3} \\
 &= \frac{5929741(c+dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{4d} - \frac{(5929741B(bc-ad)n)}{\dots} \\
 &= \frac{5929741(c+dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{4d} - \frac{(5929741B(bc-ad)n)}{\dots} \\
 &= \frac{5929741(c+dx)^4 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{4d} - \frac{(5929741B(bc-ad)n)}{\dots} \\
 &= -\frac{5929741AB(bc-ad)^3nx}{2b^3} - \frac{5929741B(bc-ad)^2n(c+dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{4b^2d} \\
 &= -\frac{5929741AB(bc-ad)^3nx}{2b^3} - \frac{5929741B^2(bc-ad)^3n(a+bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{2b^4} \\
 &= -\frac{5929741AB(bc-ad)^3nx}{2b^3} - \frac{5929741B^2(bc-ad)^3n(a+bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{2b^4} \\
 &= -\frac{5929741AB(bc-ad)^3nx}{2b^3} + \frac{29648705B^2(bc-ad)^3n^2x}{12b^3} + \frac{5929741B^2(bc-ad)^3n^2x}{12b^3} \\
 &= -\frac{5929741AB(bc-ad)^3nx}{2b^3} + \frac{29648705B^2(bc-ad)^3n^2x}{12b^3} + \frac{5929741B^2(bc-ad)^3n^2x}{12b^3} \\
 &= -\frac{5929741AB(bc-ad)^3nx}{2b^3} + \frac{29648705B^2(bc-ad)^3n^2x}{12b^3} + \frac{5929741B^2(bc-ad)^3n^2x}{12b^3}
 \end{aligned}$$



**Mathematica [A]** time = 0.321483, size = 409, normalized size = 0.9

$$i^3 \left( (c + dx)^4 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)^2 - \frac{Bn(bc-ad) \left( -3Bn(bc-ad)^3 \left( \log(a+bx) \left( \log(a+bx) - 2 \log \left( \frac{b(c+dx)}{bc-ad} \right) \right) \right) - 2 \text{PolyLog} \left( 2, \frac{d(a+bx)}{ad-bc} \right) \right) + 3b^2(c+dx)^2(bc-ad)}{4d} \right)$$

Antiderivative was successfully verified.

[In] Integrate[(c\*i + d\*i\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2,x]

[Out] (i^3\*((c + d\*x)^4\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2 - (B\*(b\*c - a\*d)\*n\*(6\*A\*b\*d\*(b\*c - a\*d)^2\*x - 3\*B\*(b\*c - a\*d)^2\*n\*(b\*d\*x + (b\*c - a\*d)\*Log[a + b\*x]) - B\*(b\*c - a\*d)\*n\*(2\*b\*d\*(b\*c - a\*d)\*x + b^2\*(c + d\*x)^2 + 2\*(b\*c - a\*d)^2\*Log[a + b\*x]) + 6\*B\*d\*(b\*c - a\*d)^2\*(a + b\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n] + 3\*b^2\*(b\*c - a\*d)\*(c + d\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 2\*b^3\*(c + d\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 6\*(b\*c - a\*d)^3\*Log[a + b\*x]\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 6\*B\*(b\*c - a\*d)^3\*n\*Log[c + d\*x] - 3\*B\*(b\*c - a\*d)^3\*n\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]) - 2\*PolyLog[2, (d\*(a + b\*x))/(-b\*c + a\*d)])))/(3\*b^4))/(4\*d)

**Maple [F]** time = 0.51, size = 0, normalized size = 0.

$$\int (dix + ci)^3 \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*i\*x+c\*i)^3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2,x)

[Out] int((d\*i\*x+c\*i)^3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2,x)

**Maxima [B]** time = 3.78814, size = 2874, normalized size = 6.33

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2,x, algorithm="maxima")

[Out]  $\frac{1}{2}A*B*d^3*i^3*x^4*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + \frac{1}{4}A^2*d^3*i^3*x^4 + 2*A*B*c*d^2*i^3*x^3*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*c*d^2*i^3*x^3 + 3*A*B*c^2*d*i^3*x^2*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + \frac{3}{2}A^2*c^2*d*i^3*x^2 - \frac{1}{12}A*B*d^3*i^3*n*(6*a^4*\log(b*x + a)/b^4 - 6*c^4*\log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + A*B*c*d^2*i^3*n*(2*a^3*\log(b*x + a)/b^3 - 2*c^3*\log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 3*A*B*c^2*d*i^3*n*(a^2*\log(b*x + a)/b^2 - c^2*\log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + 2*A*B*c^3*i^3*n*(a*\log(b*x + a)/b - c*\log(d*x + c)/d) + 2*A*B*c^3*i^3*x*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*c^3*i^3*x - \frac{1}{12}*(26*a*b^2*c^3*d*i^3*n^2 - 21*a^2*b*c^2*d^2*i^3*n^2 + 6*a^3*c*d^3*i^3*n^2 - (11*i^3*n^2 - 6*i^3*n*\log(e))*b^3*c^4)*B^2*\log(d*x + c)/(b^3*d) - \frac{1}{2}*(b^4*c^4*i^3*n^2 - 4*a*b^3*c^3*d*i^3*n^2 + 6*a^2*b^2*c^2*d^2*i^3*n^2 - 4*a^3*b*c*d^3*i^3*n^2 + a^4*d^4*i^3*n^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^4*d) + \frac{1}{12}*(3*B^2*b^4*d^4*i^3*x^4*\log(e)^2 + 6*B^2*b^4*c^4*i^3*n^2*\log(b*x + a)*log(d*x + c) - 3*B^2*b^4*c^4*i^3*n^2*\log(d*x + c)^2 + 2*(a*b^3*d^4*i^3*n*\log(e) - (i^3*n*\log(e) - 6*i^3*\log(e)^2)*b^4*c*d^3)*B^2*x^3 + ((i^3*n^2 - 9*i^3*n*\log(e) + 18*i^3*\log(e)^2)*b^4*c^2*d^2 - 2*(i^3*n^2 - 6*i^3*n*\log(e))*a*b^3*c*d^3 + (i^3*n^2 - 3*i^3*n*\log(e))*a^2*b^2*d^4)*B^2*x^2 - 3*(4*a*b^3*c^3*d*i^3*n^2 - 6*a^2*b^2*c^2*d^2*i^3*n^2 + 4*a^3*b*c*d^3*i^3*n^2 - a^4*d^4*i^3*n^2)*B^2*\log(b*x + a)^2 + ((7*i^3*n^2 - 18*i^3*n*\log(e) + 12*i^3*\log(e)^2)*b^4*c^3*d - (19*i^3*n^2 - 36*i^3*n*\log(e))*a*b^3*c^2*d^2 + (17*i^3*n^2 - 24*i^3*n*\log(e))*a^2*b^2*c*d^3 - (5*i^3*n^2 - 6*i^3*n*\log(e))*a^3*b*d^4)*B^2*x - (6*(3*i^3*n^2 - 4*i^3*n*\log(e))*a*b^3*c^3*d - 9*(5*i^3*n^2 - 4*i^3*n*\log(e))*a^2*b^2*c^2*d^2 + 2*(19*i^3*n^2 - 12*i^3*n*\log(e))*a^3*b*c*d^3 - (11*i^3*n^2 - 6*i^3*n*\log(e))*a^4*d^4)*B^2*\log(b*x + a) + 3*(B^2*b^4*d^4*i^3*x^4 + 4*B^2*b^4*c*d^3*i^3*x^3 + 6*B^2*b^4*c^2*d^2*i^3*x^2 + 4*B^2*b^4*c^3*d*i^3*x)*log((b*x + a)^n)^2 + 3*(B^2*b^4*d^4*i^3*x^4 + 4*B^2*b^4*c*d^3*i^3*x^3 + 6*B^2*b^4*c^2*d^2*i^3*x^2 + 4*B^2*b^4*c^3*d*i^3*x)*log((d*x + c)^n)^2 + (6*B^2*b^4*d^4*i^3*x^4*\log(e) - 6*B^2*b^4*c^4*i^3*n*\log(d*x + c) + 2*(a*b^3*d^4*i^3*n - (i^3*n - 12*i^3*\log(e))*b^4*c*d^3)*B^2*x^3 + 3*(4*a*b^3*c*d^3*i^3*n - a^2*b^2*d^4*i^3*n - 3*(i^3*n - 4*i^3*\log(e))*b^4*c^2*d^2)*B^2*x^2 + 6*(6*a*b^3*c^2*d^2*i^3*n - 4*a^2*b^2*c*d^3*i^3*n + a^3*b*d^4*i^3*n - (3*i^3*n - 4*i^3*\log(e))*b^4*c^3*d)*B^2*x + 6*(4*a*b^3*c^3*d*i^3*n - 6*a^2*b^2*c^2*d^2*i^3*n + 4*a^3*b*c*d^3*i^3*n - a^4*d^4*i^3*n)*B^2*\log(b*x + a)*log((b*x + a)^n) - (6*B^2*b^4*d^4*i^3*x^4*\log(e) - 6*B^2*b^4*c^4*i^3*n*\log(d*x + c) + 2*(a*b^3*d^4*i^3*n - (i^3*n - 12*i^3*\log(e))*b^4*c*d^3)*B^2*x^3 + 3*(4*a*b^3*c*d^3*i^3*n - a^2*b^2*d^4*i^3*n - 3*(i^3*n - 4*i^3*\log(e))*b^4*c^2*d^2)*B^2*x^2 + 6*(6*a*b^3*c^2*d^2*i^3*n - 4*a^2*b^2*c*d^3*i^3*n - 4*a^3*b*d^4*i^3*n - (3*i^3*n - 4*i^3*\log(e))*b^4*c^3*d)*B^2*x + 6*(4*a*b^3*c$

$$c^3 d^3 i^3 n - 6 a^2 b^2 c^2 d^2 i^3 n + 4 a^3 b c d^3 i^3 n - a^4 d^4 i^3 n) * B^2 * \log(bx + a) + 6 * (B^2 b^4 d^4 i^3 x^4 + 4 B^2 b^4 c d^3 i^3 x^3 + 6 B^2 b^4 c^2 d^2 i^3 x^2 + 4 B^2 b^4 c^3 d i^3 x) * \log((bx + a)^n) * \log((dx + c)^n) / (b^4 d)$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( A^2 d^3 i^3 x^3 + 3 A^2 c d^2 i^3 x^2 + 3 A^2 c^2 d i^3 x + A^2 c^3 i^3 + (B^2 d^3 i^3 x^3 + 3 B^2 c d^2 i^3 x^2 + 3 B^2 c^2 d i^3 x + B^2 c^3 i^3) \log \left( e \left( \frac{bx + a}{dx + c} \right) \right) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2,x, algorithm="fricas")

[Out] integral(A^2\*d^3\*i^3\*x^3 + 3\*A^2\*c\*d^2\*i^3\*x^2 + 3\*A^2\*c^2\*d\*i^3\*x + A^2\*c^3\*i^3 + (B^2\*d^3\*i^3\*x^3 + 3\*B^2\*c\*d^2\*i^3\*x^2 + 3\*B^2\*c^2\*d\*i^3\*x + B^2\*c^3\*i^3)\*log(e\*((b\*x + a)/(d\*x + c))^n))^2 + 2\*(A\*B\*d^3\*i^3\*x^3 + 3\*A\*B\*c\*d^2\*i^3\*x^2 + 3\*A\*B\*c^2\*d\*i^3\*x + A\*B\*c^3\*i^3)\*log(e\*((b\*x + a)/(d\*x + c))^n), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*\*3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c)\*\*n))\*\*2,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int (dix + ci)^3 \left( B \log \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) + A \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2, x)
```

$$3.182 \quad \int \frac{(ci+dx)^3 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{ag+bgx} dx$$

**Optimal.** Leaf size=762

$$\frac{2B^3n(bc-ad)^3 \text{PolyLog} \left( 2, \frac{b(c+dx)}{d(a+bx)} \right) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{b^4g} + \frac{2B^2i^3n^2(bc-ad)^3 \text{PolyLog} \left( 2, \frac{d(a+bx)}{b(c+dx)} \right)}{b^4g} - \frac{5B^2i^3n^2(bc-ad)^3 \text{PolyLog} \left( 3, \frac{b(c+dx)}{d(a+bx)} \right)}{b^4g}$$

```
[Out] (B^2*d*(b*c - a*d)^2*i^3*n^2*x)/(3*b^3*g) - (5*B*d*(b*c - a*d)^2*i^3*n*(a +
b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b^4*g) - (B*(b*c - a*d)*i^
3*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b^2*g) + (d*(b*c
- a*d)^2*i^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(b^4*g) +
((b*c - a*d)*i^3*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*
b^2*g) + (i^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(3*b*g)
+ (2*B*(b*c - a*d)^3*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c
- a*d)/(b*(c + d*x)))]/(b^4*g) + (B^2*(b*c - a*d)^3*i^3*n^2*Log[(a + b*x)/
(c + d*x)])/(3*b^4*g) + (2*B^2*(b*c - a*d)^3*i^3*n^2*Log[c + d*x])/(b^4*g)
+ (5*B*(b*c - a*d)^3*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[1 - (
b*(c + d*x))/(d*(a + b*x)))]/(3*b^4*g) - ((b*c - a*d)^3*i^3*(A + B*Log[e*((
a + b*x)/(c + d*x))^n])^2*Log[1 - (b*(c + d*x))/(d*(a + b*x)))]/(b^4*g) + (
2*B^2*(b*c - a*d)^3*i^3*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x)))]/(b^4*g)
) - (5*B^2*(b*c - a*d)^3*i^3*n^2*PolyLog[2, (b*(c + d*x))/(d*(a + b*x)))]/(
3*b^4*g) + (2*B*(b*c - a*d)^3*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*
PolyLog[2, (b*(c + d*x))/(d*(a + b*x)))]/(b^4*g) + (2*B^2*(b*c - a*d)^3*i^3
*n^2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x)))]/(b^4*g)
```

**Rubi [B]** time = 5.62427, antiderivative size = 1995, normalized size of antiderivative = 2.62, number of steps used = 101, number of rules used = 28, integrand size = 45,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.622$ , Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2500, 2440, 2434, 2433, 2375, 2317, 2374, 6589, 2499, 2302, 30, 2396, 2525, 2486, 31, 43}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x
),x]
```

```
[Out] (-5*A*B*d*(b*c - a*d)^2*i^3*n*x)/(3*b^3*g) + (B^2*d*(b*c - a*d)^2*i^3*n^2*x
)/(3*b^3*g) + (B^2*(b*c - a*d)^3*i^3*n^2*Log[a + b*x])/(3*b^4*g) - (a*B^2*d
```

$$\begin{aligned}
& *(b*c - a*d)^2*i^3*n^2*\text{Log}[a + b*x]^2)/(b^4*g) + (5*B^2*(b*c - a*d)^3*i^3*n \\
& ^2*\text{Log}[a + b*x]^2)/(6*b^4*g) - (A*B*(b*c - a*d)^3*i^3*n*\text{Log}[g*(a + b*x)]^2) \\
& /(b^4*g) + (B^2*(b*c - a*d)^3*i^3*n^2*\text{Log}[g*(a + b*x)]^3)/(3*b^4*g) - (B^2* \\
& (b*c - a*d)^3*i^3*n^2*\text{Log}[g*(a + b*x)]^2*\text{Log}[-c - d*x])/(b^4*g) + (2*B^2*(b \\
& *c - a*d)^3*i^3*n*\text{Log}[g*(a + b*x)]*\text{Log}[(a + b*x)^n]*\text{Log}[-c - d*x])/(b^4*g) \\
& - (B^2*(b*c - a*d)^3*i^3*\text{Log}[(a + b*x)^n]^2*\text{Log}[-c - d*x])/(b^4*g) - (5*B^2 \\
& *d*(b*c - a*d)^2*i^3*n*(a + b*x)*\text{Log}[e*((a + b*x)/(c + d*x))^n])/(3*b^4*g) \\
& - (B*(b*c - a*d)*i^3*n*(c + d*x)^2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]))/ \\
& (3*b^2*g) + (2*a*B*d*(b*c - a*d)^2*i^3*n*\text{Log}[a + b*x]*(A + B*\text{Log}[e*((a + b* \\
& x)/(c + d*x))^n]))/(b^4*g) - (5*B*(b*c - a*d)^3*i^3*n*\text{Log}[a + b*x]*(A + B*L \\
& og[e*((a + b*x)/(c + d*x))^n]))/(3*b^4*g) + (d*(b*c - a*d)^2*i^3*x*(A + B*L \\
& og[e*((a + b*x)/(c + d*x))^n])^2)/(b^3*g) + ((b*c - a*d)*i^3*(c + d*x)^2*(A \\
& + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2)/(2*b^2*g) + (i^3*(c + d*x)^3*(A + B \\
& *Log[e*((a + b*x)/(c + d*x))^n])^2)/(3*b*g) + (5*B^2*(b*c - a*d)^3*i^3*n^2* \\
& \text{Log}[c + d*x])/(3*b^4*g) + (2*B^2*c*(b*c - a*d)^2*i^3*n^2*\text{Log}[-((d*(a + b*x) \\
& ))/(b*c - a*d)])*\text{Log}[c + d*x])/(b^3*g) - (2*B*c*(b*c - a*d)^2*i^3*n*(A + B*L \\
& og[e*((a + b*x)/(c + d*x))^n])*\text{Log}[c + d*x])/(b^3*g) - (B^2*c*(b*c - a*d)^2 \\
& *i^3*n^2*\text{Log}[c + d*x]^2)/(b^3*g) + (2*a*B^2*d*(b*c - a*d)^2*i^3*n^2*\text{Log}[a + \\
& b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)])/(b^4*g) - (5*B^2*(b*c - a*d)^3*i^3*n^ \\
& 2*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)])/(3*b^4*g) + (B^2*(b*c - a*d) \\
& ^3*i^3*n^2*\text{Log}[g*(a + b*x)]^2*\text{Log}[(b*(c + d*x))/(b*c - a*d)])/(b^4*g) + (B^ \\
& 2*(b*c - a*d)^3*i^3*\text{Log}[(a + b*x)^n]^2*\text{Log}[(b*(c + d*x))/(b*c - a*d)])/(b^4 \\
& *g) + (B^2*(b*c - a*d)^3*i^3*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[(c + d*x) \\
& ]^(-n))^2)/(b^4*g) - (B^2*(b*c - a*d)^3*i^3*\text{Log}[g*(a + b*x)]*\text{Log}[(c + d*x) \\
& ]^(-n))^2)/(b^4*g) + ((b*c - a*d)^3*i^3*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n] \\
& )^2*\text{Log}[a*g + b*g*x])/(b^4*g) + (2*A*B*(b*c - a*d)^3*i^3*n*\text{Log}[(b*(c + d*x) \\
& )/(b*c - a*d)]*\text{Log}[a*g + b*g*x])/(b^4*g) - (2*B^2*(b*c - a*d)^3*i^3*n*\text{Log}[( \\
& b*(c + d*x))/(b*c - a*d)]*(\text{Log}[(a + b*x)^n] - \text{Log}[e*((a + b*x)/(c + d*x))^n \\
& ] + \text{Log}[(c + d*x)^(-n)])*\text{Log}[a*g + b*g*x])/(b^4*g) - (B^2*(b*c - a*d)^3*i^3 \\
& *n*\text{Log}[e*((a + b*x)/(c + d*x))^n]*\text{Log}[a*g + b*g*x]^2)/(b^4*g) - (B^2*(b*c - \\
& a*d)^3*i^3*n^2*\text{Log}[(b*(c + d*x))/(b*c - a*d)]*\text{Log}[a*g + b*g*x]^2)/(b^4*g) \\
& + (2*A*B*(b*c - a*d)^3*i^3*n*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))])/(b^4 \\
& *g) + (2*a*B^2*d*(b*c - a*d)^2*i^3*n^2*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a* \\
& d))])/(b^4*g) - (5*B^2*(b*c - a*d)^3*i^3*n^2*\text{PolyLog}[2, -((d*(a + b*x))/(b* \\
& c - a*d))])/(3*b^4*g) + (2*B^2*(b*c - a*d)^3*i^3*n*\text{Log}[(a + b*x)^n]*\text{PolyLog} \\
& [2, -((d*(a + b*x))/(b*c - a*d))])/(b^4*g) - (2*B^2*(b*c - a*d)^3*i^3*n*(Lo \\
& g[(a + b*x)^n] - \text{Log}[e*((a + b*x)/(c + d*x))^n] + \text{Log}[(c + d*x)^(-n)])*\text{Poly} \\
& Log[2, -((d*(a + b*x))/(b*c - a*d))])/(b^4*g) + (2*B^2*c*(b*c - a*d)^2*i^3* \\
& n^2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])/(b^3*g) - (2*B^2*(b*c - a*d)^3*i \\
& ^3*n*\text{Log}[(c + d*x)^(-n)]*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])/(b^4*g) - ( \\
& 2*B^2*(b*c - a*d)^3*i^3*n^2*\text{PolyLog}[3, -((d*(a + b*x))/(b*c - a*d))])/(b^4* \\
& g) - (2*B^2*(b*c - a*d)^3*i^3*n^2*\text{PolyLog}[3, (b*(c + d*x))/(b*c - a*d)])/(b \\
& ^4*g)
\end{aligned}$$

Rule 2528

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.), x_Symbol] := Simp[x*(a +
b*Log[c*Rfx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(Rfx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, Rfx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
Rfx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifierIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k_.)*(x_)), x_Symbol] := Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a + b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n])/(j + k*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n])/(j + k*x), x)) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ[b*c - a*d, 0]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] := Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*1)/1) + (e*x)/1)^n])*(f +
```



$g \cdot \text{Log}[h \cdot (-((j \cdot k - i \cdot 1)/1) + (j \cdot x)/1)^m], x], x, k + 1 \cdot x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h, i, j, k, l, m, n\}, x\} \&\& \text{IntegerQ}[r]$

#### Rule 2434

$\text{Int}[(((a_{\cdot}) + \text{Log}[(c_{\cdot}) \cdot ((d_{\cdot}) + (e_{\cdot}) \cdot (x_{\cdot}))^{(n_{\cdot})})] \cdot (b_{\cdot})) \cdot ((f_{\cdot}) + \text{Log}[(h_{\cdot}) \cdot ((i_{\cdot}) + (j_{\cdot}) \cdot (x_{\cdot}))^{(m_{\cdot})})] \cdot (g_{\cdot})))/(x_{\cdot}), x\_Symbol] \rightarrow \text{Simp}[\text{Log}[x] \cdot (a + b \cdot \text{Log}[c \cdot (d + e \cdot x)^n]) \cdot (f + g \cdot \text{Log}[h \cdot (i + j \cdot x)^m]), x] + (-\text{Dist}[e \cdot g \cdot m, \text{Int}[(\text{Log}[x] \cdot (a + b \cdot \text{Log}[c \cdot (d + e \cdot x)^n])]/(d + e \cdot x), x], x] - \text{Dist}[b \cdot j \cdot n, \text{Int}[(\text{Log}[x] \cdot (f + g \cdot \text{Log}[h \cdot (i + j \cdot x)^m])]/(i + j \cdot x), x], x)]) /; \text{FreeQ}\{a, b, c, d, e, f, g, h, i, j, m, n\}, x\} \&\& \text{EqQ}[e \cdot i - d \cdot j, 0]$

#### Rule 2433

$\text{Int}[((a_{\cdot}) + \text{Log}[(c_{\cdot}) \cdot ((d_{\cdot}) + (e_{\cdot}) \cdot (x_{\cdot}))^{(n_{\cdot})})] \cdot (b_{\cdot}))^{(p_{\cdot})} \cdot ((f_{\cdot}) + \text{Log}[(h_{\cdot}) \cdot ((i_{\cdot}) + (j_{\cdot}) \cdot (x_{\cdot}))^{(m_{\cdot})})] \cdot (g_{\cdot})) \cdot ((k_{\cdot}) + (l_{\cdot}) \cdot (x_{\cdot}))^{(r_{\cdot})}), x\_Symbol] \rightarrow \text{Dist}[1/e, \text{Subst}[\text{Int}[(k \cdot x)/d]^r \cdot (a + b \cdot \text{Log}[c \cdot x^n])^p \cdot (f + g \cdot \text{Log}[h \cdot (e \cdot i - d \cdot j)/e + (j \cdot x)/e]^m)], x], x, d + e \cdot x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h, i, j, k, l, n, p, r\}, x\} \&\& \text{EqQ}[e \cdot k - d \cdot l, 0]$

#### Rule 2375

$\text{Int}[(\text{Log}[(d_{\cdot}) \cdot ((e_{\cdot}) + (f_{\cdot}) \cdot (x_{\cdot}))^{(m_{\cdot})})]^{(r_{\cdot})}) \cdot ((a_{\cdot}) + \text{Log}[(c_{\cdot}) \cdot (x_{\cdot}))^{(n_{\cdot})})] \cdot (b_{\cdot}))^{(p_{\cdot})}/(x_{\cdot}), x\_Symbol] \rightarrow \text{Simp}[(\text{Log}[d \cdot (e + f \cdot x^m)]^r) \cdot (a + b \cdot \text{Log}[c \cdot x^n])^{(p+1)}/(b \cdot n \cdot (p+1)), x] - \text{Dist}[(f \cdot m \cdot r)/(b \cdot n \cdot (p+1)), \text{Int}[(x^{(m-1)} \cdot (a + b \cdot \text{Log}[c \cdot x^n])^{(p+1)})/(e + f \cdot x^m), x], x] /; \text{FreeQ}\{a, b, c, d, e, f, r, m, n\}, x\} \&\& \text{IGtQ}[p, 0] \&\& \text{NeQ}[d \cdot e, 1]$

#### Rule 2317

$\text{Int}[((a_{\cdot}) + \text{Log}[(c_{\cdot}) \cdot (x_{\cdot}))^{(n_{\cdot})})] \cdot (b_{\cdot}))^{(p_{\cdot})}/((d_{\cdot}) + (e_{\cdot}) \cdot (x_{\cdot})), x\_Symbol] \rightarrow \text{Simp}[(\text{Log}[1 + (e \cdot x)/d] \cdot (a + b \cdot \text{Log}[c \cdot x^n])^p)/e, x] - \text{Dist}[(b \cdot n \cdot p)/e, \text{Int}[(\text{Log}[1 + (e \cdot x)/d] \cdot (a + b \cdot \text{Log}[c \cdot x^n])^{(p-1)})/x, x], x] /; \text{FreeQ}\{a, b, c, d, e, n\}, x\} \&\& \text{IGtQ}[p, 0]$

#### Rule 2374

$\text{Int}[(\text{Log}[(d_{\cdot}) \cdot ((e_{\cdot}) + (f_{\cdot}) \cdot (x_{\cdot}))^{(m_{\cdot})})] \cdot ((a_{\cdot}) + \text{Log}[(c_{\cdot}) \cdot (x_{\cdot}))^{(n_{\cdot})})] \cdot (b_{\cdot}))^{(p_{\cdot})}/(x_{\cdot}), x\_Symbol] \rightarrow -\text{Simp}[(\text{PolyLog}[2, -(d \cdot f \cdot x^m)] \cdot (a + b \cdot \text{Log}[c \cdot x^n])^p)/m, x] + \text{Dist}[(b \cdot n \cdot p)/m, \text{Int}[(\text{PolyLog}[2, -(d \cdot f \cdot x^m)] \cdot (a + b \cdot \text{Log}[c \cdot x^n])^{(p-1)})/x, x], x] /; \text{FreeQ}\{a, b, c, d, e, f, m, n\}, x\} \&\& \text{IGtQ}[p, 0] \&\& \text{EqQ}[d \cdot e, 1]$

#### Rule 6589

Int[PolyLog[n\_, (c\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)]/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] := Simp[PolyLog[n + 1, c\*(a + b\*x)^p]/(e\*p), x] /; FreeQ[{a, b, c, d, e, n, p}, x] && EqQ[b\*d, a\*e]

### Rule 2499

Int[(Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.)]^(r\_.)]\*((s\_.) + Log[(i\_.)\*((g\_.) + (h\_.)\*(x\_))^(n\_.)]\*(t\_.))^(m\_.)]/((j\_.) + (k\_.)\*(x\_)), x\_Symbol] := Simp[((s + t\*Log[i\*(g + h\*x)^n])^(m + 1)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r)]/(k\*n\*t\*(m + 1)), x] + (-Dist[(b\*p\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(a + b\*x), x], x] - Dist[(d\*q\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(c + d\*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0] && EqQ[h\*j - g\*k, 0] && IGtQ[m, 0]

### Rule 2302

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/(x\_), x\_Symbol] := Dist[1/(b\*n), Subst[Int[x^p, x], x, a + b\*Log[c\*x^n]], x] /; FreeQ[{a, b, c, n, p}, x]

### Rule 30

Int[(x\_)^(m\_.), x\_Symbol] := Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && NeQ[m, -1]

### Rule 2396

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])^p)/g, x] - Dist[(b\*e\*n\*p)/g, Int[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])^(p - 1))/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p}, x] && NeQ[e\*f - d\*g, 0] && IGtQ[p, 1]

### Rule 2525

Int[((a\_.) + Log[(c\_.)\*(RFX\_)^(p\_.)]\*(b\_.))^(n\_.)\*((d\_.) + (e\_.)\*(x\_))^(m\_.), x\_Symbol] := Simp[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFX^p])^n)/(e\*(m + 1)), x] - Dist[(b\*n\*p)/(e\*(m + 1)), Int[SimplifyIntegrand[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFX^p])^(n - 1)\*D[RFX, x])/RFX, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

### Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q]^r]^s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

### Rule 31

```
Int[((a_.) + (b_.)*(x_))^(n_.), x_Symbol] := Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

### Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

### Rubi steps

$$\begin{aligned}
\int \frac{(182c + 182dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{ag + bgx} dx &= \int \left( \frac{6028568d(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3g} + \frac{33124d(bc - ad)(182d)^3}{b^3g} \right) dx \\
&= \frac{(6028568(bc - ad)^3) \int \frac{\left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{ag+bgx} dx}{b^3} + \frac{(182d)^3 \int (182c + 182dx)^3}{b^3g} \\
&= \frac{6028568d(bc - ad)^2 x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3g} + \frac{3014284(bc - ad)(c + dx)^3}{b^3g} \\
&= \frac{6028568d(bc - ad)^2 x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3g} + \frac{3014284(bc - ad)(c + dx)^3}{b^3g} \\
&= \frac{6028568d(bc - ad)^2 x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3g} + \frac{3014284(bc - ad)(c + dx)^3}{b^3g} \\
&= \frac{6028568d(bc - ad)^2 x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3g} + \frac{3014284(bc - ad)(c + dx)^3}{b^3g} \\
&= -\frac{30142840ABd(bc - ad)^2 nx}{3b^3g} - \frac{6028568B(bc - ad)n(c + dx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3b^2g} \\
&= -\frac{30142840ABd(bc - ad)^2 nx}{3b^3g} - \frac{30142840B^2d(bc - ad)^2 n(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{3b^4g} \\
&= -\frac{30142840ABd(bc - ad)^2 nx}{3b^3g} - \frac{30142840B^2d(bc - ad)^2 n(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{3b^4g} \\
&= -\frac{30142840ABd(bc - ad)^2 nx}{3b^3g} + \frac{6028568B^2d(bc - ad)^2 n^2 x}{3b^3g} + \frac{6028568B^2d(bc - ad)^2 n^2 x}{3b^3g} \\
&= -\frac{30142840ABd(bc - ad)^2 nx}{3b^3g} + \frac{6028568B^2d(bc - ad)^2 n^2 x}{3b^3g} + \frac{6028568B^2d(bc - ad)^2 n^2 x}{3b^3g}
\end{aligned}$$

**Mathematica [B]** time = 4.9175, size = 2941, normalized size = 3.86

Result too large to show

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(a\*g + b\*g\*x), x]

[Out]  $(i^3(6*b*d*(3*b^2*c^2 - 3*a*b*c*d + a^2*d^2)*x*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n] - B*n*\text{Log}[(a + b*x)/(c + d*x)])^2 + 3*b^2*d^2*(3*b*c - a*d)*x^2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n] - B*n*\text{Log}[(a + b*x)/(c + d*x)])^2 + 2*b^3*d^3*x^3*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n] - B*n*\text{Log}[(a + b*x)/(c + d*x)])^2 + 6*(b*c - a*d)^3*\text{Log}[a + b*x]*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n] - B*n*\text{Log}[(a + b*x)/(c + d*x)])^2 - 18*b^2*B*c^2*n*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n] - B*n*\text{Log}[(a + b*x)/(c + d*x)])*(a*d*\text{Log}[a/b + x]^2 - 2*a*d*\text{Log}[a/b + x]*(1 + \text{Log}[a + b*x]) + 2*(-(b*c) + a*d + \text{Log}[c/d + x]*(b*c + a*d*\text{Log}[a + b*x] - a*d*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)])) + (-(b*d*x) + a*d*\text{Log}[a + b*x])* \text{Log}[(a + b*x)/(c + d*x)] - 2*a*d*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]) - 2*B*n*(-A - B*\text{Log}[e*((a + b*x)/(c + d*x))^n] + B*n*\text{Log}[(a + b*x)/(c + d*x)])*(6*a^2*b*c*d^2 - 6*a^3*d^3 + 2*b^3*c^2*d*x + 3*a*b^2*c*d^2*x - 5*a^2*b*d^3*x - b^3*c*d^2*x^2 + a*b^2*d^3*x^2 - 3*a^3*d^3*\text{Log}[a/b + x]^2 - 6*a^2*b*c*d^2*\text{Log}[c/d + x] + 5*a^3*d^3*\text{Log}[a + b*x] - 6*a^3*d^3*\text{Log}[c/d + x]* \text{Log}[a + b*x] + 6*a^3*d^3*\text{Log}[a/b + x]*(1 + \text{Log}[a + b*x]) + 6*a^3*d^3*\text{Log}[c/d + x]* \text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] + 6*a^2*b*d^3*x*\text{Log}[(a + b*x)/(c + d*x)] - 3*a*b^2*d^3*x^2*\text{Log}[(a + b*x)/(c + d*x)] + 2*b^3*d^3*x^3*\text{Log}[(a + b*x)/(c + d*x)] - 6*a^3*d^3*\text{Log}[a + b*x]* \text{Log}[(a + b*x)/(c + d*x)] - 2*b^3*c^3*\text{Log}[c + d*x] - 3*a*b^2*c^2*d*\text{Log}[c + d*x] + 6*a^3*d^3*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]) + 6*b^3*B*c^3*n*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n] - B*n*\text{Log}[(a + b*x)/(c + d*x)])*(\text{Log}[a/b + x]^2 - 2*\text{Log}[a + b*x]*(\text{Log}[a/b + x] - \text{Log}[c/d + x] - \text{Log}[(a + b*x)/(c + d*x)]) - 2*(\text{Log}[c/d + x]* \text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] + \text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])) + 9*b*B*c*n*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n] - B*n*\text{Log}[(a + b*x)/(c + d*x)])*(-4*a*d^2*(a + b*x)*(-1 + \text{Log}[a/b + x]) + 2*a^2*d^2*\text{Log}[a/b + x]^2 + 4*a*b*d*(c + d*x)*(-1 + \text{Log}[c/d + x]) + d^2*(b*x*(2*a - b*x) + 2*b^2*x^2*\text{Log}[a/b + x] - 2*a^2*\text{Log}[a + b*x]) - 2*d^2*(b*x*(-2*a + b*x) + 2*a^2*\text{Log}[a + b*x])*(\text{Log}[a/b + x] - \text{Log}[c/d + x] - \text{Log}[(a + b*x)/(c + d*x)]) + b^2*(d*x*(-2*c + d*x) - 2*d^2*x^2*\text{Log}[c/d + x] + 2*c^2*\text{Log}[c + d*x]) - 4*a^2*d^2*(\text{Log}[c/d + x]* \text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] + \text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])) + 6*b^2*B^2*c^2*n^2*(\text{Log}[(a + b*x)/(c + d*x)]*(-(a*d*\text{Log}[(a + b*x)/(c + d*x)]^2) + 6*(b*c - a*d)* \text{Log}[(b*c - a*d)/(b*c + b*d*x)] + 3*d*\text{Log}[(a + b*x)/(c + d*x)]*(a + b*x + a*\text{Log}[(b*c - a*d)/(b*c + b*d*x)])) + 6*(b*c - a*d + a*d*\text{Log}[(a + b*x)/(c + d*x)])*\text{PolyLog}[2, (d*(a + b*x))/(b*(c + d*x))] - 6*a*d*\text{PolyLog}[3, (d*(a + b*x))/(b*(c + d*x))] - 3*b*B^2*c*n^2*(6*b^2*c$

$$\begin{aligned}
& ^2\text{Log}[(b*c - a*d)/(c + d*x)] - 12*a*b*c*d*\text{Log}[(b*c - a*d)/(c + d*x)] + 6*a \\
& ^2*d^2*\text{Log}[(b*c - a*d)/(c + d*x)] + 6*a*b*c*d*\text{Log}[(a + b*x)/(c + d*x)] - 6* \\
& a^2*d^2*\text{Log}[(a + b*x)/(c + d*x)] + 6*b^2*c*d*x*\text{Log}[(a + b*x)/(c + d*x)] - 6 \\
& *a*b*d^2*x*\text{Log}[(a + b*x)/(c + d*x)] + 9*a^2*d^2*\text{Log}[(a + b*x)/(c + d*x)]^2 \\
& + 6*a*b*d^2*x*\text{Log}[(a + b*x)/(c + d*x)]^2 - 3*b^2*d^2*x^2*\text{Log}[(a + b*x)/(c + \\
& d*x)]^2 - 2*a^2*d^2*\text{Log}[(a + b*x)/(c + d*x)]^3 + 6*b^2*c^2*\text{Log}[(a + b*x)/( \\
& c + d*x)]*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] + 12*a*b*c*d*\text{Log}[(a + b*x)/(c + d* \\
& x)]*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] - 18*a^2*d^2*\text{Log}[(a + b*x)/(c + d*x)]*Lo \\
& g[(b*c - a*d)/(b*c + b*d*x)] + 6*a^2*d^2*\text{Log}[(a + b*x)/(c + d*x)]^2*\text{Log}[(b* \\
& c - a*d)/(b*c + b*d*x)] + 6*(b^2*c^2 + 2*a*b*c*d - 3*a^2*d^2 + 2*a^2*d^2*Lo \\
& g[(a + b*x)/(c + d*x)])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - 12*a^2*d^ \\
& 2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))] + B^2*n^2*(2*b^3*c^3 - 4*a*b^2*c \\
& ^2*d + 2*a^2*b*c*d^2 + 2*b^3*c^2*d*x - 4*a*b^2*c*d^2*x + 2*a^2*b*d^3*x + 6* \\
& b^3*c^3*\text{Log}[(b*c - a*d)/(c + d*x)] - 18*a^2*b*c*d^2*\text{Log}[(b*c - a*d)/(c + d* \\
& x)] + 12*a^3*d^3*\text{Log}[(b*c - a*d)/(c + d*x)] + 4*a*b^2*c^2*d*\text{Log}[(a + b*x)/( \\
& c + d*x)] + 8*a^2*b*c*d^2*\text{Log}[(a + b*x)/(c + d*x)] - 12*a^3*d^3*\text{Log}[(a + b* \\
& x)/(c + d*x)] + 4*b^3*c^2*d*x*\text{Log}[(a + b*x)/(c + d*x)] + 6*a*b^2*c*d^2*x*Lo \\
& g[(a + b*x)/(c + d*x)] - 10*a^2*b*d^3*x*\text{Log}[(a + b*x)/(c + d*x)] - 2*b^3*c* \\
& d^2*x^2*\text{Log}[(a + b*x)/(c + d*x)] + 2*a*b^2*d^3*x^2*\text{Log}[(a + b*x)/(c + d*x)] \\
& + 11*a^3*d^3*\text{Log}[(a + b*x)/(c + d*x)]^2 + 6*a^2*b*d^3*x*\text{Log}[(a + b*x)/(c + \\
& d*x)]^2 - 3*a*b^2*d^3*x^2*\text{Log}[(a + b*x)/(c + d*x)]^2 + 2*b^3*d^3*x^3*\text{Log}[( \\
& a + b*x)/(c + d*x)]^2 - 2*a^3*d^3*\text{Log}[(a + b*x)/(c + d*x)]^3 + 4*b^3*c^3*Lo \\
& g[(a + b*x)/(c + d*x)]*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] + 6*a*b^2*c^2*d*\text{Log}[( \\
& a + b*x)/(c + d*x)]*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] + 12*a^2*b*c*d^2*\text{Log}[(a \\
& + b*x)/(c + d*x)]*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] - 22*a^3*d^3*\text{Log}[(a + b*x) \\
& /(c + d*x)]*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] + 6*a^3*d^3*\text{Log}[(a + b*x)/(c + d \\
& *x)]^2*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] + 2*(2*b^3*c^3 + 3*a*b^2*c^2*d + 6*a^ \\
& 2*b*c*d^2 - 11*a^3*d^3 + 6*a^3*d^3*\text{Log}[(a + b*x)/(c + d*x)])*PolyLog[2, (d* \\
& (a + b*x))/(b*(c + d*x))] - 12*a^3*d^3*PolyLog[3, (d*(a + b*x))/(b*(c + d*x \\
& ))] - 6*b^3*B^2*c^3*n^2*(\text{Log}[(-b*c) + a*d]/(d*(a + b*x)))*\text{Log}[(a + b*x)/( \\
& c + d*x)]^2 - 2*\text{Log}[(a + b*x)/(c + d*x)]*PolyLog[2, (b*(c + d*x))/(d*(a + b \\
& *x))] - 2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])/(6*b^4*g)
\end{aligned}$$

**Maple [F]** time = 0.672, size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3}{bgx + ag} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*i\*x+c\*i)^3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g),x)

```
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x)
```

---

**Maxima [F]** time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x, a
lgorithm="maxima")
```

```
[Out] 3*A^2*c^2*d*i^3*(x/(b*g) - a*log(b*x + a)/(b^2*g)) - 1/6*A^2*d^3*i^3*(6*a^3
*log(b*x + a)/(b^4*g) - (2*b^2*x^3 - 3*a*b*x^2 + 6*a^2*x)/(b^3*g)) + 3/2*A^
2*c*d^2*i^3*(2*a^2*log(b*x + a)/(b^3*g) + (b*x^2 - 2*a*x)/(b^2*g)) + A^2*c^
3*i^3*log(b*g*x + a*g)/(b*g) + 1/6*(2*B^2*b^3*d^3*i^3*x^3 + 3*(3*b^3*c*d^2*
i^3 - a*b^2*d^3*i^3)*B^2*x^2 + 6*(3*b^3*c^2*d*i^3 - 3*a*b^2*c*d^2*i^3 + a^2
*b*d^3*i^3)*B^2*x + 6*(b^3*c^3*i^3 - 3*a*b^2*c^2*d*i^3 + 3*a^2*b*c*d^2*i^3
- a^3*d^3*i^3)*B^2*log(b*x + a))*log((d*x + c)^n)^2/(b^4*g) - integrate(-1/
3*(3*B^2*b^4*c^4*i^3*log(e)^2 + 6*A*B*b^4*c^4*i^3*log(e) + 3*(B^2*b^4*d^4*i
^3*log(e)^2 + 2*A*B*b^4*d^4*i^3*log(e))*x^4 + 12*(B^2*b^4*c*d^3*i^3*log(e)^
2 + 2*A*B*b^4*c*d^3*i^3*log(e))*x^3 + 18*(B^2*b^4*c^2*d^2*i^3*log(e)^2 + 2*
A*B*b^4*c^2*d^2*i^3*log(e))*x^2 + 3*(B^2*b^4*d^4*i^3*x^4 + 4*B^2*b^4*c*d^3*
i^3*x^3 + 6*B^2*b^4*c^2*d^2*i^3*x^2 + 4*B^2*b^4*c^3*d*i^3*x + B^2*b^4*c^4*i
^3)*log((b*x + a)^n)^2 + 12*(B^2*b^4*c^3*d*i^3*log(e)^2 + 2*A*B*b^4*c^3*d*i
^3*log(e))*x + 6*(B^2*b^4*c^4*i^3*log(e) + A*B*b^4*c^4*i^3 + (B^2*b^4*d^4*i
^3*log(e) + A*B*b^4*d^4*i^3))*x^4 + 4*(B^2*b^4*c*d^3*i^3*log(e) + A*B*b^4*c*
d^3*i^3)*x^3 + 6*(B^2*b^4*c^2*d^2*i^3*log(e) + A*B*b^4*c^2*d^2*i^3)*x^2 + 4
*(B^2*b^4*c^3*d*i^3*log(e) + A*B*b^4*c^3*d*i^3)*x*log((b*x + a)^n) - (6*B^
2*b^4*c^4*i^3*log(e) + 6*A*B*b^4*c^4*i^3 + 2*(3*A*B*b^4*d^4*i^3 + (i^3*n +
3*i^3*log(e))*B^2*b^4*d^4)*x^4 + (24*A*B*b^4*c*d^3*i^3 - (a*b^3*d^4*i^3*n -
3*(3*i^3*n + 8*i^3*log(e))*b^4*c*d^3)*B^2)*x^3 + 3*(12*A*B*b^4*c^2*d^2*i^3
- (3*a*b^3*c*d^3*i^3*n - a^2*b^2*d^4*i^3*n - 6*(i^3*n + 2*i^3*log(e))*b^4*
c^2*d^2)*B^2)*x^2 + 6*(4*A*B*b^4*c^3*d*i^3 + (3*a*b^3*c^2*d^2*i^3*n - 3*a^2
*b^2*c*d^3*i^3*n + a^3*b*d^4*i^3*n + 4*b^4*c^3*d*i^3*log(e))*B^2)*x + 6*((b
^4*c^3*d*i^3*n - 3*a*b^3*c^2*d^2*i^3*n + 3*a^2*b^2*c*d^3*i^3*n - a^3*b*d^4*
i^3*n)*B^2*x + (a*b^3*c^3*d*i^3*n - 3*a^2*b^2*c^2*d^2*i^3*n + 3*a^3*b*c*d^3
*i^3*n - a^4*d^4*i^3*n)*B^2)*log(b*x + a) + 6*(B^2*b^4*d^4*i^3*x^4 + 4*B^2*
b^4*c*d^3*i^3*x^3 + 6*B^2*b^4*c^2*d^2*i^3*x^2 + 4*B^2*b^4*c^3*d*i^3*x + B^2
*b^4*c^4*i^3)*log((b*x + a)^n))*log((d*x + c)^n)/(b^5*d*g*x^2 + a*b^4*c*g
+ (b^5*c*g + a*b^4*d*g)*x), x)
```

---

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{A^2 d^3 i^3 x^3 + 3 A^2 c d^2 i^3 x^2 + 3 A^2 c^2 d i^3 x + A^2 c^3 i^3 + (B^2 d^3 i^3 x^3 + 3 B^2 c d^2 i^3 x^2 + 3 B^2 c^2 d i^3 x + B^2 c^3 i^3) \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right)}{bgx + ag} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g), x, algorithm="fricas")

[Out] integral((A^2\*d^3\*i^3\*x^3 + 3\*A^2\*c\*d^2\*i^3\*x^2 + 3\*A^2\*c^2\*d\*i^3\*x + A^2\*c^3\*i^3 + (B^2\*d^3\*i^3\*x^3 + 3\*B^2\*c\*d^2\*i^3\*x^2 + 3\*B^2\*c^2\*d\*i^3\*x + B^2\*c^3\*i^3)\*log(e\*((b\*x + a)/(d\*x + c))^n))^2 + 2\*(A\*B\*d^3\*i^3\*x^3 + 3\*A\*B\*c\*d^2\*i^3\*x^2 + 3\*A\*B\*c^2\*d\*i^3\*x + A\*B\*c^3\*i^3)\*log(e\*((b\*x + a)/(d\*x + c))^n))/(b\*g\*x + a\*g), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*\*3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c)\*\*n)))\*\*2/(b\*g\*x+a\*g), x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3 \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2}{bgx + ag} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g), x, algorithm="giac")



```
[Out] integrate((d*i*x + c*i)^3*(B*log(e*((b*x + a)/(d*x + c)))^n) + A)^2/(b*g*x + a*g), x)
```

$$3.183 \quad \int \frac{(ci+dx)^3 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ag+bgx)^2} dx$$

**Optimal.** Leaf size=739

$$\frac{6Bdi^3n(bc-ad)^2 \text{PolyLog} \left( 2, \frac{b(c+dx)}{d(a+bx)} \right) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{b^4g^2} + \frac{4B^2di^3n^2(bc-ad)^2 \text{PolyLog} \left( 2, \frac{d(a+bx)}{b(c+dx)} \right)}{b^4g^2} - \frac{B^2di^3n^2(bc-ad)^2 \text{PolyLog} \left( 3, \frac{b(c+dx)}{d(a+bx)} \right)}{b^4g^2}$$

```
[Out] (-2*B^2*(b*c - a*d)^2*i^3*n^2*(c + d*x))/(b^3*g^2*(a + b*x)) - (B*d^2*(b*c - a*d)*i^3*n*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^4*g^2) - (2*B*(b*c - a*d)^2*i^3*n*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^3*g^2*(a + b*x)) + (2*d^2*(b*c - a*d)*i^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(b^4*g^2) - ((b*c - a*d)^2*i^3*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(b^3*g^2*(a + b*x)) + (d*i^3*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*b^2*g^2) + (4*B*d*(b*c - a*d)^2*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x)))]/(b^4*g^2) + (B^2*d*(b*c - a*d)^2*i^3*n^2*Log[c + d*x])/(b^4*g^2) + (B*d*(b*c - a*d)^2*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^2) - (3*d*(b*c - a*d)^2*i^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^2) + (4*B^2*d*(b*c - a*d)^2*i^3*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b^4*g^2) - (B^2*d*(b*c - a*d)^2*i^3*n^2*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^2) + (6*B*d*(b*c - a*d)^2*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^2) + (6*B^2*d*(b*c - a*d)^2*i^3*n^2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])/(b^4*g^2)
```

**Rubi [B]** time = 4.73816, antiderivative size = 1875, normalized size of antiderivative = 2.54, number of steps used = 83, number of rules used = 23, integrand size = 45,  $\frac{\text{number of rules}}{\text{integrand size}}$  = 0.511, Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 2486, 31, 44, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x)^2,x]
```

```
[Out] -((A*B*d^2*(b*c - a*d)*i^3*n*x)/(b^3*g^2)) - (2*B^2*(b*c - a*d)^3*i^3*n^2)/(b^4*g^2*(a + b*x)) - (2*B^2*d*(b*c - a*d)^2*i^3*n^2*Log[a + b*x])/(b^4*g^2)
```

$$\begin{aligned}
& - (3A*B*d*(b*c - a*d)^2*i^3*n*Log[a + b*x]^2)/(b^4*g^2) + (a^2*B^2*d^3*i^3*n^2*Log[a + b*x]^2)/(2*b^4*g^2) - (a*B^2*d^2*(3*b*c - 2*a*d)*i^3*n^2*Log[a + b*x]^2)/(b^4*g^2) + (B^2*d*(b*c - a*d)^2*i^3*n^2*Log[a + b*x]^2)/(b^4*g^2) - (B^2*d^2*(b*c - a*d)*i^3*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(b^4*g^2) - (3*B^2*d*(b*c - a*d)^2*i^3*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*((a + b*x)/(c + d*x))^n]^2)/(b^4*g^2) - (3*B^2*d*(b*c - a*d)^2*i^3*Log[a + b*x]*Log[e*((a + b*x)/(c + d*x))^n]^2)/(b^4*g^2) - (2*B*(b*c - a*d)^3*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(b^4*g^2*(a + b*x)) - (a^2*B*d^3*i^3*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(b^4*g^2) + (2*a*B*d^2*(3*b*c - 2*a*d)*i^3*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^4*g^2) - (2*B*d*(b*c - a*d)^2*i^3*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^4*g^2) + (d^2*(3*b*c - 2*a*d)*i^3*x*(A + B*Log[e*((a + b*x)/(c + d*x))^n]^2)/(b^3*g^2) + (d^3*i^3*x^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]^2)/(2*b^2*g^2) - ((b*c - a*d)^3*i^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]^2)/(b^4*g^2*(a + b*x)) + (3*d*(b*c - a*d)^2*i^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]^2)/(b^4*g^2) + (3*B^2*d*(b*c - a*d)^2*i^3*n^2*Log[c + d*x])/(b^4*g^2) - (B^2*c^2*d*i^3*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b^2*g^2) + (2*B^2*c*d*(3*b*c - 2*a*d)*i^3*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b^3*g^2) - (2*B^2*d*(b*c - a*d)^2*i^3*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b^4*g^2) + (B*c^2*d*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(b^2*g^2) - (2*B*c*d*(3*b*c - 2*a*d)*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(b^3*g^2) + (2*B*d*(b*c - a*d)^2*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(b^4*g^2) + (B^2*c^2*d*i^3*n^2*Log[c + d*x]^2)/(2*b^2*g^2) - (B^2*c*d*(3*b*c - 2*a*d)*i^3*n^2*Log[c + d*x]^2)/(b^3*g^2) + (B^2*d*(b*c - a*d)^2*i^3*n^2*Log[c + d*x]^2)/(b^4*g^2) + (6*A*B*d*(b*c - a*d)^2*i^3*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d])/(b^4*g^2) - (a^2*B^2*d^3*i^3*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d])/(b^4*g^2) + (2*a*B^2*d^2*(3*b*c - 2*a*d)*i^3*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d])/(b^4*g^2) - (2*B^2*d*(b*c - a*d)^2*i^3*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d])/(b^4*g^2) + (6*A*B*d*(b*c - a*d)^2*i^3*n*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))]/(b^4*g^2) - (a^2*B^2*d^3*i^3*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))]/(b^4*g^2) + (2*a*B^2*d^2*(3*b*c - 2*a*d)*i^3*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))]/(b^4*g^2) - (2*B^2*d*(b*c - a*d)^2*i^3*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))]/(b^4*g^2) - (B^2*c^2*d*i^3*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d])/(b^2*g^2) + (2*B^2*c*d*(3*b*c - 2*a*d)*i^3*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d])/(b^3*g^2) - (2*B^2*d*(b*c - a*d)^2*i^3*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d])/(b^4*g^2) + (6*B^2*d*(b*c - a*d)^2*i^3*n*Log[e*((a + b*x)/(c + d*x))^n]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))]/(b^4*g^2) + (6*B^2*d*(b*c - a*d)^2*i^3*n^2*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))]/(b^4*g^2)
\end{aligned}$$

### Rule 2528

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*(RGx\_), x\_Symbol] := With

```
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^n, x_Symbol] := Simp[x*(a + b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_) /; FreeQ[b, x]]
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^n/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^n]*(b_.))^p*(RFx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^n]*(b_.))^p*((f_) + (g_.)*(x_))^q, x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^n]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.))^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

### Rule 31

```
Int[((a_) + (b_.)*(x_))^(n_.), x_Symbol] := Simp[Log[RemoveContent[a + b*x, x]]/b, x] /; FreeQ[{a, b}, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
```

+ n + 2, 0])

### Rule 6688

Int[u\_, x\_Symbol] :=> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifierIntegrandQ[v, u, x]]

### Rule 6742

Int[u\_, x\_Symbol] :=> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]

### Rule 2411

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_.) + (g\_.)\*(x\_))^(q\_.)\*((h\_.) + (i\_.)\*(x\_))^(r\_.), x\_Symbol] :=> Dist[1/e, Subst[Int[((g\*x)/e)^q\*((e\*h - d\*i)/e + (i\*x)/e)^r\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e\*f - d\*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2\*r]

### Rule 2344

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/((x\_)\*((d\_) + (e\_.)\*(x\_))), x\_Symbol] :=> Dist[1/d, Int[(a + b\*Log[c\*x^n])^p/x, x], x] - Dist[e/d, Int[(a + b\*Log[c\*x^n])^p/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

### Rule 2317

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/((d\_) + (e\_.)\*(x\_)), x\_Symbol] :=> Simp[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^p)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

### Rule 2507

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.)\*Log[(i\_.)\*((j\_.)\*((g\_.) + (h\_.)\*(x\_))^(t\_.))^(u\_.)]\*(v\_), x\_Symbol] :=> With[{k = Simplify[v\*(a + b\*x)\*(c + d\*x)]}, Simp[(k\*Log[i\*(j\*(g + h\*x)^t]^u)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s + 1))/(p\*r\*(s + 1)\*(b\*c - a\*d)), x] - Dist[(k\*h\*t\*u)/(p\*r\*(s + 1)\*(b\*c - a\*d)), Int[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s + 1)/(g + h\*x), x], x] /; FreeQ[k, x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && NeQ[s, -1]

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] := -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q]^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] := With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] := With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /; !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{(183c + 183dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ag + bgx)^2} dx &= \int \left( \frac{6128487d^2(3bc - 2ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3g^2} + \frac{6128487d^3x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3g^2} \right) dx \\
&= \frac{(6128487d^3) \int x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx}{b^2g^2} + \frac{(6128487d^2(3bc - 2ad)) \int \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx}{b^3g^2} \\
&= \frac{6128487d^2(3bc - 2ad)x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3g^2} + \frac{6128487d^3x^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{2b^3g^2} \\
&= \frac{6128487d^2(3bc - 2ad)x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3g^2} + \frac{6128487d^3x^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{2b^3g^2} \\
&= \frac{6128487d^2(3bc - 2ad)x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3g^2} + \frac{6128487d^3x^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{2b^3g^2} \\
&= \frac{6128487d^2(3bc - 2ad)x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3g^2} + \frac{6128487d^3x^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{2b^3g^2} \\
&= -\frac{6128487ABd^2(bc - ad)nx}{b^3g^2} - \frac{12256974B(bc - ad)^3n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^4g^2(a + bx)} \\
&= -\frac{6128487ABd^2(bc - ad)nx}{b^3g^2} - \frac{6128487B^2d^2(bc - ad)n(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^4g^2} \\
&= -\frac{6128487ABd^2(bc - ad)nx}{b^3g^2} - \frac{6128487B^2d^2(bc - ad)n(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^4g^2} \\
&= -\frac{6128487ABd^2(bc - ad)nx}{b^3g^2} - \frac{12256974B^2(bc - ad)^3n^2}{b^4g^2(a + bx)} - \frac{12256974B^2(bc - ad)n(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^4g^2} \\
&= -\frac{6128487ABd^2(bc - ad)nx}{b^3g^2} - \frac{12256974B^2(bc - ad)^3n^2}{b^4g^2(a + bx)} - \frac{12256974B^2(bc - ad)n(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^4g^2} \\
&= -\frac{6128487ABd^2(bc - ad)nx}{b^3g^2} - \frac{12256974B^2(bc - ad)^3n^2}{b^4g^2(a + bx)} - \frac{12256974B^2(bc - ad)n(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^4g^2}
\end{aligned}$$



**Mathematica [B]** time = 14.4706, size = 4942, normalized size = 6.69

Result too large to show

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(a\*g + b\*g\*x)^2,x]

[Out]  $(d^2(3bc - 2ad)i^3x(A + B(\log[e((a + bx)/(c + dx))^n] - n\log[(a + bx)/(c + dx)]))^2/(b^3g^2) + (d^3i^3x^2(A + B(\log[e((a + bx)/(c + dx))^n] - n\log[(a + bx)/(c + dx)]))^2/(2b^2g^2) + (3d(bc - ad)^2i^3\log[a + bx](A + B(\log[e((a + bx)/(c + dx))^n] - n\log[(a + bx)/(c + dx)]))^2/(b^4g^2) + (-A^2b^3c^3i^3 + 3aA^2b^2c^2di^3 - 3a^2A^2b^3c^3i^3 + a^3A^2d^3i^3 - 2Ab^3B^3c^3i^3(\log[e((a + bx)/(c + dx))^n] - n\log[(a + bx)/(c + dx)])) + 6aAb^2B^3c^2di^3(\log[e((a + bx)/(c + dx))^n] - n\log[(a + bx)/(c + dx)] - 6a^2Ab^3B^3c^2di^3(\log[e((a + bx)/(c + dx))^n] - n\log[(a + bx)/(c + dx)])) + 2a^3ABd^3i^3(\log[e((a + bx)/(c + dx))^n] - n\log[(a + bx)/(c + dx)])) - b^3B^2c^3i^3(\log[e((a + bx)/(c + dx))^n] - n\log[(a + bx)/(c + dx)]))^2 + 3ab^2B^2c^2di^3(\log[e((a + bx)/(c + dx))^n] - n\log[(a + bx)/(c + dx)]))^2 - 3a^2bB^2c^2di^3(\log[e((a + bx)/(c + dx))^n] - n\log[(a + bx)/(c + dx)]))^2 + a^3B^2d^3i^3(\log[e((a + bx)/(c + dx))^n] - n\log[(a + bx)/(c + dx)]))^2/(b^4g^2(a + bx)) + (2B^3c^3i^3n(A + B(\log[e((a + bx)/(c + dx))^n] - n\log[(a + bx)/(c + dx)])))*(-((a/b + x)(\log[a/b + x] + \log[a/b + x]^2))/((a + bx)^2\log[a/b + x])) - ((b(c/d + x)\log[c/d + x])/((-a + (bc)/d)^2(1 - (b(c/d + x))/(-a + (bc)/d))) + \log[1 - (b(c/d + x))/(-a + (bc)/d)]/(-a + (bc)/d))/b - (-\log[a/b + x] + \log[c/d + x] + \log[a/(c + dx) + (bx)/(c + dx)])/(b(a + bx)))/g^2 + (2B^3d^3i^3n(A + B(\log[e((a + bx)/(c + dx))^n] - n\log[(a + bx)/(c + dx)])))*((-2a(a/b + x)(-1 + \log[a/b + x]))/b^3 + (3a^2\log[a/b + x]^2)/(2b^4) + (a^3(1 + \log[a/b + x]))/(b^4(a + bx)) + (2a(c/d + x)(-1 + \log[c/d + x]))/b^3 + ((ax)/(2b) - x^2/4 + (x^2\log[a/b + x])/2 - (a^2\log[a + bx])/(2b^2))/b^2 - ((cx)/(2d) - x^2/4 + (x^2\log[c/d + x])/2 - (c^2\log[c + dx])/(2d^2))/b^2 + (a^3(-(\log[c/d + x]/(b(a + bx)))) + (d(\log[a + bx]/(bc - ad) - \log[c + dx]/(bc - ad)))/b)/b^3 + ((-4abx + b^2x^2 + (2a^3)/(a + bx) + 6a^2\log[a + bx])(-\log[a/b + x] + \log[c/d + x] + \log[a/(c + dx) + (bx)/(c + dx)]))/(2b^4) - (3a^2(\log[c/d + x]\log[(a + bx)/(a - (bc)/d)])/b + \text{PolyLog}[2, (bd(c/d + x))/(bc - ad)]/b)/b^3)/g^2 + (6B^3c^2d^2i^3n(A + B(\log[e((a + bx)/(c + dx))^n] - n\log[(a + bx)/(c + dx)])))*((a/b + x)(-1 + \log[a/b + x]))/b^2 - (a\log[a/b + x]^2)/b^3 - (a^2(1 + \log[a/b + x]))/(b^3(a + bx)) - ((c/d + x)(-1 + \log[c/d + x]))/b^2 - (a^2(-(\log[c/d + x]/(b(a + bx)))) + (d(\log[a + bx]/(bc - ad) - \log[c + dx]/(bc - ad)))/b)/b^2 + ((bx -$

$$\begin{aligned}
& a^2/(a + b*x) - 2*a*\text{Log}[a + b*x]*(-\text{Log}[a/b + x] + \text{Log}[c/d + x] + \text{Log}[a/(c + d*x) + (b*x)/(c + d*x)])/b^3 + (2*a*((\text{Log}[c/d + x]*\text{Log}[(a + b*x)/(a - (b*c)/d)])/b + \text{PolyLog}[2, (b*d*(c/d + x))/(b*c - a*d)]/b)/b^2)/g^2 + (6*B*c^2*d*i^3*n*(A + B*(\text{Log}[e*((a + b*x)/(c + d*x))]^n - n*\text{Log}[(a + b*x)/(c + d*x)])))*(\text{Log}[a/b + x]^2/(2*b^2) + (a*(1 + \text{Log}[a/b + x]))/(b^2*(a + b*x)) + (a*(-(\text{Log}[c/d + x]/(b*(a + b*x)))) + (d*(\text{Log}[a + b*x]/(b*c - a*d) - \text{Log}[c + d*x]/(b*c - a*d)))/b)/b + ((a/(a + b*x) + \text{Log}[a + b*x])*(-\text{Log}[a/b + x] + \text{Log}[c/d + x] + \text{Log}[a/(c + d*x) + (b*x)/(c + d*x)]))/b^2 - ((\text{Log}[c/d + x]*\text{Log}[(a + b*x)/(a - (b*c)/d)])/b + \text{PolyLog}[2, (b*d*(c/d + x))/(b*c - a*d)]/b)/g^2 + (B^2*c^3*i^3*n^2*(-2*b*c + 2*a*d - 2*d*(a + b*x)*\text{Log}[a + b*x] - 2*(b*c - a*d)*\text{Log}[(a + b*x)/(c + d*x)] - 2*d*(a + b*x)*\text{Log}[a + b*x]*\text{Log}[(a + b*x)/(c + d*x)] - (b*c - a*d)*\text{Log}[(a + b*x)/(c + d*x)]^2 + 2*d*(a + b*x)*\text{Log}[c + d*x] - 2*d*(a + b*x)*\text{Log}[(a + b*x)/(c + d*x)]*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] + d*(a + b*x)*(\text{Log}[a + b*x]*(\text{Log}[a + b*x] - 2*\text{Log}[(b*(c + d*x))/(b*c - a*d)])) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-b*c + a*d)] + d*(a + b*x)*(\text{Log}[(b*c - a*d)/(b*c + b*d*x)]*(2*\text{Log}[(d*(a + b*x))/(-b*c + a*d)] + \text{Log}[(b*c - a*d)/(b*c + b*d*x)])) - 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]))/b*(b*c - a*d)*g^2*(a + b*x) + (B^2*d^3*i^3*n^2*((-2*b^2*c^2*(b*c - a*d)*\text{Log}[(b*c - a*d)/(c + d*x)])/d^2 + 2*a^2*(-b*c + a*d)*\text{Log}[(b*c - a*d)/(c + d*x)] - (4*a*b*c*(-b*c + a*d)*\text{Log}[(b*c - a*d)/(c + d*x)]/d + (b^3*c^3*\text{Log}[(a + b*x)/(c + d*x)]^2)/d^2 - (a*b^2*c^2*\text{Log}[(a + b*x)/(c + d*x)]^2)/d - ((b*c - a*d)^2*(b*c + 5*a*d)*\text{Log}[(a + b*x)/(c + d*x)]^2)/d^2 + (b*c - a*d)*(a + b*x)^2*\text{Log}[(a + b*x)/(c + d*x)]^2 + 2*a^2*b*c*\text{Log}[(a + b*x)/(c + d*x)]^3 - 2*a^3*d*\text{Log}[(a + b*x)/(c + d*x)]^3 + (2*(-b*c + a*d)*(a + b*x)*\text{Log}[(a + b*x)/(c + d*x)]*(b*c - a*d + 3*a*d*\text{Log}[(a + b*x)/(c + d*x)]))/d + (2*a^3*b*(c + d*x)*(2 + 2*\text{Log}[(a + b*x)/(c + d*x)] + \text{Log}[(a + b*x)/(c + d*x)]^2))/(a + b*x) - 9*a^2*b*c*(\text{Log}[(a + b*x)/(c + d*x)]*(\text{Log}[(a + b*x)/(c + d*x)] - 2*\text{Log}[(b*c - a*d)/(b*c + b*d*x)])) - 2*\text{PolyLog}[2, (d*(a + b*x))/(b*(c + d*x))] + (4*a*b^2*c^2*(\text{Log}[(a + b*x)/(c + d*x)]*(\text{Log}[(a + b*x)/(c + d*x)] - 2*\text{Log}[(b*c - a*d)/(b*c + b*d*x)])) - 2*\text{PolyLog}[2, (d*(a + b*x))/(b*(c + d*x))])/d + 5*a^3*d*(\text{Log}[(a + b*x)/(c + d*x)]*(\text{Log}[(a + b*x)/(c + d*x)] - 2*\text{Log}[(b*c - a*d)/(b*c + b*d*x)])) - 2*\text{PolyLog}[2, (d*(a + b*x))/(b*(c + d*x))] - (b^2*c^2*(b*c - a*d)*(\text{Log}[(a + b*x)/(c + d*x)]*(2*\text{Log}[(b*c - a*d)/(d*(a + b*x))] + \text{Log}[(a + b*x)/(c + d*x)])) - 2*\text{PolyLog}[2, (b*(c + d*x))/(d*(a + b*x))])/d^2 + 2*a^2*(-b*c + a*d)*(\text{Log}[(a + b*x)/(c + d*x)]^2*(3*\text{Log}[(b*c - a*d)/(d*(a + b*x))] + \text{Log}[(a + b*x)/(c + d*x)])) - 6*\text{Log}[(a + b*x)/(c + d*x)]*\text{PolyLog}[2, (b*(c + d*x))/(d*(a + b*x))] - 6*\text{PolyLog}[3, (b*(c + d*x))/(d*(a + b*x))])/((2*b^4*(b*c - a*d)*g^2) + (B^2*c^2*d*i^3*n^2*(6*b*c - 6*a*d - (6*b^2*c*x)/(a + b*x) + (6*a*b*d*x)/(a + b*x) + 6*a*d*\text{Log}[a/b + x] + 3*b*c*\text{Log}[a/b + x]^2 - 3*a*d*\text{Log}[a/b + x]^2 - 6*b*c*\text{Log}[c/d + x] + 6*b*c*\text{Log}[a + b*x] - 6*a*d*\text{Log}[a + b*x] - 6*b*c*\text{Log}[a/b + x]*\text{Log}[a + b*x] + 6*a*d*\text{Log}[a/b + x]*\text{Log}[a + b*x] + 6*b*c*\text{Log}[c/d + x]*\text{Log}[a + b*x] - 6*a*d*\text{Log}[c/d + x]*\text{Log}[a + b*x] - 6*b*c*\text{Log}[c/d + x]*\text{Log}[(d*(a + b*x))/(-b*c + a*d)] + 6*a*d*\text{Log}[c/d + x]*\text{Log}[(d*(a + b*x))/(-b*c + a*d)] - (6*b*(b*c - a*d)*x*\text{Log}[(a + b*x)/(c + d*x)]/(a + b*x) + 6*b*c*\text{Log}[a + b*x]*\text{Log}[(a + b*x)/(c + d*x)]
\end{aligned}$$

$$\begin{aligned}
& - 6*a*d*\text{Log}[a + b*x]*\text{Log}[(a + b*x)/(c + d*x)] + 3*a*d*\text{Log}[(a + b*x)/(c + d*x)]^2 \\
& + 3*b*d*x*\text{Log}[(a + b*x)/(c + d*x)]^2 - (3*b^2*x*(c + d*x)*\text{Log}[(a + b*x)/(c + d*x)]^2)/(a + b*x) \\
& - 3*b*c*\text{Log}[(-b*c) + a*d]/(d*(a + b*x))*\text{Log}[(a + b*x)/(c + d*x)]^2 - a*d*\text{Log}[(a + b*x)/(c + d*x)]^3 \\
& + 6*b*c*\text{Log}[(a + b*x)/(c + d*x)]*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] - 6*a*d*\text{Log}[(a + b*x)/(c + d*x)] \\
& *\text{Log}[(b*c - a*d)/(b*c + b*d*x)] + 3*a*d*\text{Log}[(a + b*x)/(c + d*x)]^2*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] \\
& + 6*(b*c - a*d + a*d*\text{Log}[(a + b*x)/(c + d*x)])*\text{PolyLog}[2, (d*(a + b*x))/(b*(c + d*x))] \\
& - 6*(b*c - a*d)*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)] + 6*b*c*\text{Log}[(a + b*x)/(c + d*x)]*\text{PolyLog}[2, (b*(c + d*x))/(d*(a + b*x))] \\
& - 6*a*d*\text{PolyLog}[3, (d*(a + b*x))/(b*(c + d*x))] + 6*b*c*\text{PolyLog}[3, (b*(c + d*x))/(d*(a + b*x))] \\
& )/(b^2*(b*c - a*d)*g^2) - (B^2*c*d*i^3*n^2*(6*a^2*b*c*d + 6*a^2*b*d^2*x + 6*a^2*b*c*d*\text{Log}[(a + b*x)/(c + d*x)] + 6*a^2*b*d^2*x*\text{Log}[(a + b*x)/(c + d*x)] \\
& + 12*a^2*b*c*d*\text{Log}[(-b*c) + a*d]/(d*(a + b*x)))*\text{Log}[(a + b*x)/(c + d*x)] + 12*a*b^2*c*d*x*\text{Log}[(-b*c) + a*d]/(d*(a + b*x)) \\
& )*\text{Log}[(a + b*x)/(c + d*x)] + 6*a^2*b*c*d*\text{Log}[(a + b*x)/(c + d*x)]^2 + 3*a^3*d^2*\text{Log}[(a + b*x)/(c + d*x)]^2 \\
& + 9*a^2*b*d^2*x*\text{Log}[(a + b*x)/(c + d*x)]^2 - 3*b^3*c*d*x^2*\text{Log}[(a + b*x)/(c + d*x)]^2 + 3*a*b^2*d^2*x^2*\text{Log}[(a + b*x)/(c + d*x)]^2 \\
& - 6*a^2*b*c*d*\text{Log}[(-b*c) + a*d]/(d*(a + b*x))*\text{Log}[(a + b*x)/(c + d*x)]^2 - 6*a*b^2*c*d*x*\text{Log}[(-b*c) + a*d]/(d*(a + b*x)) \\
& )*\text{Log}[(a + b*x)/(c + d*x)]^2 - 2*a^3*d^2*\text{Log}[(a + b*x)/(c + d*x)]^3 - 2*a^2*b*d^2*x*\text{Log}[(a + b*x)/(c + d*x)]^3 \\
& - 6*a*b^2*c^2*\text{Log}[(a + b*x)/(c + d*x)]*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] - 6*a^3*d^2*\text{Log}[(a + b*x)/(c + d*x)]*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] \\
& - 6*b^3*c^2*x*\text{Log}[(a + b*x)/(c + d*x)]*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] - 6*a^2*b*d^2*x*\text{Log}[(a + b*x)/(c + d*x)]*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] \\
& + 6*a^3*d^2*\text{Log}[(a + b*x)/(c + d*x)]^2*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] + 6*a^2*b*d^2*x*\text{Log}[(a + b*x)/(c + d*x)]^2*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] \\
& + 6*(a + b*x)*(-b^2*c^2 - a^2*d^2 + 2*a^2*d^2*\text{Log}[(a + b*x)/(c + d*x)])*\text{PolyLog}[2, (d*(a + b*x))/(b*(c + d*x))] \\
& + 12*a*b*c*d*(a + b*x)*(-1 + \text{Log}[(a + b*x)/(c + d*x)])*\text{PolyLog}[2, (b*(c + d*x))/(d*(a + b*x))] - 12*a^3*d^2*\text{PolyLog}[3, (d*(a + b*x))/(b*(c + d*x))] \\
& - 12*a^2*b*d^2*x*\text{PolyLog}[3, (d*(a + b*x))/(b*(c + d*x))] + 12*a^2*b*c*d*\text{PolyLog}[3, (b*(c + d*x))/(d*(a + b*x))] \\
& + 12*a*b^2*c*d*x*\text{PolyLog}[3, (b*(c + d*x))/(d*(a + b*x)))]/(b^3*(b*c - a*d)*g^2*(a + b*x))
\end{aligned}$$

**Maple [F]** time = 0.686, size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3}{(bgx + ag)^2} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*i\*x+c\*i)^3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^2,x)

[Out]  $\int ((d*i*x+c*i)^3*(A+B*\ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2, x)$

---

**Maxima [F]** time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2, x, algorithm="maxima")`

[Out] 
$$\begin{aligned} & -2*A*B*c^3*i^3*n*(1/(b^2*g^2*x + a*b*g^2) + d*\log(b*x + a)/((b^2*c - a*b*d) \\ & *g^2) - d*\log(d*x + c)/((b^2*c - a*b*d)*g^2)) - 3*A^2*(a^2/(b^4*g^2*x + a*b \\ & ^3*g^2) - x/(b^2*g^2) + 2*a*\log(b*x + a)/(b^3*g^2))*c*d^2*i^3 + 1/2*(2*a^3/ \\ & (b^5*g^2*x + a*b^4*g^2) + 6*a^2*\log(b*x + a)/(b^4*g^2) + (b*x^2 - 4*a*x)/(b \\ & ^3*g^2))*A^2*d^3*i^3 + 3*A^2*c^2*d*i^3*(a/(b^3*g^2*x + a*b^2*g^2) + \log(b*x \\ & + a)/(b^2*g^2)) - 2*A*B*c^3*i^3*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^ \\ & 2*g^2*x + a*b*g^2) - A^2*c^3*i^3/(b^2*g^2*x + a*b*g^2) + 1/2*(B^2*b^3*d^3*i \\ & ^3*x^3 + 3*(2*b^3*c*d^2*i^3 - a*b^2*d^3*i^3)*B^2*x^2 + 2*(3*a*b^2*c*d^2*i^3 \\ & - 2*a^2*b*d^3*i^3)*B^2*x - 2*(b^3*c^3*i^3 - 3*a*b^2*c^2*d*i^3 + 3*a^2*b*c* \\ & d^2*i^3 - a^3*d^3*i^3)*B^2 + 6*((b^3*c^2*d*i^3 - 2*a*b^2*c*d^2*i^3 + a^2*b* \\ & d^3*i^3)*B^2*x + (a*b^2*c^2*d*i^3 - 2*a^2*b*c*d^2*i^3 + a^3*d^3*i^3)*B^2)*\log \\ & (b*x + a))*\log((d*x + c)^n)^2/(b^5*g^2*x + a*b^4*g^2) - \text{integrate}(- (B^2*b \\ & ^4*c^4*i^3*\log(e)^2 + (B^2*b^4*d^4*i^3*\log(e)^2 + 2*A*B*b^4*d^4*i^3*\log(e)) \\ & *x^4 + 4*(B^2*b^4*c*d^3*i^3*\log(e)^2 + 2*A*B*b^4*c*d^3*i^3*\log(e))*x^3 + 6* \\ & (B^2*b^4*c^2*d^2*i^3*\log(e)^2 + 2*A*B*b^4*c^2*d^2*i^3*\log(e))*x^2 + (B^2*b^ \\ & 4*d^4*i^3*x^4 + 4*B^2*b^4*c*d^3*i^3*x^3 + 6*B^2*b^4*c^2*d^2*i^3*x^2 + 4*B^2 \\ & *b^4*c^3*d*i^3*x + B^2*b^4*c^4*i^3)*\log((b*x + a)^n)^2 + 2*(2*B^2*b^4*c^3*d \\ & i^3*\log(e)^2 + 3*A*B*b^4*c^3*d*i^3*\log(e))*x + 2*(B^2*b^4*c^4*i^3*\log(e) + \\ & (B^2*b^4*d^4*i^3*\log(e) + A*B*b^4*d^4*i^3))*x^4 + 4*(B^2*b^4*c*d^3*i^3*\log \\ & (e) + A*B*b^4*c*d^3*i^3)*x^3 + 6*(B^2*b^4*c^2*d^2*i^3*\log(e) + A*B*b^4*c^2*d \\ & ^2*i^3)*x^2 + (4*B^2*b^4*c^3*d*i^3*\log(e) + 3*A*B*b^4*c^3*d*i^3)*x*\log((b* \\ & x + a)^n) - ((2*A*B*b^4*d^4*i^3 + (i^3*n + 2*i^3*\log(e))*B^2*b^4*d^4)*x^4 + \\ & 2*(4*A*B*b^4*c*d^3*i^3 - (a*b^3*d^4*i^3*n - (3*i^3*n + 4*i^3*\log(e))*b^4*c \\ & *d^3)*B^2)*x^3 - 2*(a*b^3*c^3*d*i^3*n - 3*a^2*b^2*c^2*d^2*i^3*n + 3*a^3*b*c \\ & *d^3*i^3*n - a^4*d^4*i^3*n - b^4*c^4*i^3*\log(e))*B^2 + (12*A*B*b^4*c^2*d^2* \\ & i^3 + (12*a*b^3*c*d^3*i^3*n - 7*a^2*b^2*d^4*i^3*n + 12*b^4*c^2*d^2*i^3*\log \\ & (e))*B^2)*x^2 + 2*(3*A*B*b^4*c^3*d*i^3 + (3*a*b^3*c^2*d^2*i^3*n - a^3*b*d^4* \\ & i^3*n - (i^3*n - 4*i^3*\log(e))*b^4*c^3*d)*B^2)*x + 6*((b^4*c^2*d^2*i^3*n - \\ & 2*a*b^3*c*d^3*i^3*n + a^2*b^2*d^4*i^3*n)*B^2*x^2 + 2*(a*b^3*c^2*d^2*i^3*n - \\ & 2*a^2*b^2*c*d^3*i^3*n + a^3*b*d^4*i^3*n)*B^2*x + (a^2*b^2*c^2*d^2*i^3*n - \end{aligned}$$

$$2*a^3*b*c*d^3*i^3*n + a^4*d^4*i^3*n)*B^2)*\log(b*x + a) + 2*(B^2*b^4*d^4*i^3*x^4 + 4*B^2*b^4*c*d^3*i^3*x^3 + 6*B^2*b^4*c^2*d^2*i^3*x^2 + 4*B^2*b^4*c^3*d*i^3*x + B^2*b^4*c^4*i^3)*\log((b*x + a)^n)*\log((d*x + c)^n)/(b^6*d*g^2*x^3 + a^2*b^4*c*g^2 + (b^6*c*g^2 + 2*a*b^5*d*g^2)*x^2 + (2*a*b^5*c*g^2 + a^2*b^4*d*g^2)*x), x)$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{A^2 d^3 i^3 x^3 + 3 A^2 c d^2 i^3 x^2 + 3 A^2 c^2 d i^3 x + A^2 c^3 i^3 + (B^2 d^3 i^3 x^3 + 3 B^2 c d^2 i^3 x^2 + 3 B^2 c^2 d i^3 x + B^2 c^3 i^3) \log \left( e \left( \frac{b x + a}{d x + c} \right) \right)}{b^2 g^2 x^2 + 2 a b g^2 x + a^2 g^2} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x,
algorithm="fricas")
```

```
[Out] integral((A^2*d^3*i^3*x^3 + 3*A^2*c*d^2*i^3*x^2 + 3*A^2*c^2*d*i^3*x + A^2*c^3*i^3 + (B^2*d^3*i^3*x^3 + 3*B^2*c*d^2*i^3*x^2 + 3*B^2*c^2*d*i^3*x + B^2*c^3*i^3)*log(e*((b*x + a)/(d*x + c))^n))^2 + 2*(A*B*d^3*i^3*x^3 + 3*A*B*c*d^2*i^3*x^2 + 3*A*B*c^2*d*i^3*x + A*B*c^3*i^3)*log(e*((b*x + a)/(d*x + c))^n))/(b^2*g^2*x^2 + 2*a*b*g^2*x + a^2*g^2), x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c)**n))**2/(b*g*x+a*g)**2,x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3 \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2}{(bgx + ag)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x,
algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(b*g*x +
a*g)^2, x)
```

$$3.184 \quad \int \frac{(ci+dx)^3 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ag+bgx)^3} dx$$

**Optimal.** Leaf size=644

$$\frac{6Bd^2i^3n(bc-ad)\text{PolyLog}\left(2, \frac{b(c+dx)}{d(a+bx)}\right)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^4g^3} + \frac{2B^2d^2i^3n^2(bc-ad)\text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)}{b^4g^3} + \frac{6B^2d^2i^3n^2}{b^4g^3}$$

```
[Out] (-4*B^2*d*(b*c - a*d)*i^3*n^2*(c + d*x))/(b^3*g^3*(a + b*x)) - (B^2*(b*c - a*d)*i^3*n^2*(c + d*x)^2)/(4*b^2*g^3*(a + b*x)^2) - (4*B*d*(b*c - a*d)*i^3*n*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(b^3*g^3*(a + b*x)) - (B*(b*c - a*d)*i^3*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(2*b^2*g^3*(a + b*x)^2) + (d^3*i^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(b^4*g^3) - (2*d*(b*c - a*d)*i^3*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(b^3*g^3*(a + b*x)) - ((b*c - a*d)*i^3*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*b^2*g^3*(a + b*x)^2) + (2*B*d^2*(b*c - a*d)*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))]/(b^4*g^3) - (3*d^2*(b*c - a*d)*i^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[1 - (b*(c + d*x))/(d*(a + b*x))]/(b^4*g^3) + (2*B^2*d^2*(b*c - a*d)*i^3*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))]/(b^4*g^3) + (6*B*d^2*(b*c - a*d)*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))]/(b^4*g^3) + (6*B^2*d^2*(b*c - a*d)*i^3*n^2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))]/(b^4*g^3))
```

**Rubi [B]** time = 4.81111, antiderivative size = 1512, normalized size of antiderivative = 2.35, number of steps used = 88, number of rules used = 21, integrand size = 45,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.467$ , Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 44, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x)^3,x]
```

```
[Out] -(B^2*(b*c - a*d)^3*i^3*n^2)/(4*b^4*g^3*(a + b*x)^2) - (9*B^2*d*(b*c - a*d)^2*i^3*n^2)/(2*b^4*g^3*(a + b*x)) - (9*B^2*d^2*(b*c - a*d)*i^3*n^2*Log[a + b*x]/(2*b^4*g^3) - (3*A*B*d^2*(b*c - a*d)*i^3*n*Log[a + b*x]^2)/(b^4*g^3)
```

$$\begin{aligned}
& - (a*B^2*d^3*i^3*n^2*\text{Log}[a + b*x]^2)/(b^4*g^3) + (5*B^2*d^2*(b*c - a*d)*i^3 \\
& *n^2*\text{Log}[a + b*x]^2)/(2*b^4*g^3) - (3*B^2*d^2*(b*c - a*d)*i^3*\text{Log}[-((b*c - \\
& a*d)/(d*(a + b*x))])*\text{Log}[e*((a + b*x)/(c + d*x))^n]^2)/(b^4*g^3) - (3*B^2*d \\
& ^2*(b*c - a*d)*i^3*\text{Log}[a + b*x]*\text{Log}[e*((a + b*x)/(c + d*x))^n]^2)/(b^4*g^3) \\
& - (B*(b*c - a*d)^3*i^3*n*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]))/(2*b^4*g^ \\
& 3*(a + b*x)^2) - (5*B*d*(b*c - a*d)^2*i^3*n*(A + B*\text{Log}[e*((a + b*x)/(c + d* \\
& x))^n]))/(b^4*g^3*(a + b*x)) + (2*a*B*d^3*i^3*n*\text{Log}[a + b*x]*(A + B*\text{Log}[e*( \\
& (a + b*x)/(c + d*x))^n]))/(b^4*g^3) - (5*B*d^2*(b*c - a*d)*i^3*n*\text{Log}[a + b* \\
& x]*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]))/(b^4*g^3) + (d^3*i^3*x*(A + B*Lo \\
& g[e*((a + b*x)/(c + d*x))^n]^2)/(b^3*g^3) - ((b*c - a*d)^3*i^3*(A + B*\text{Log}[ \\
& e*((a + b*x)/(c + d*x))^n]^2)/(2*b^4*g^3*(a + b*x)^2) - (3*d*(b*c - a*d)^2 \\
& *i^3*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]^2)/(b^4*g^3*(a + b*x)) + (3*d^2 \\
& *(b*c - a*d)*i^3*\text{Log}[a + b*x]*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]^2)/(b^ \\
& 4*g^3) + (9*B^2*d^2*(b*c - a*d)*i^3*n^2*\text{Log}[c + d*x])/(2*b^4*g^3) + (2*B^2* \\
& c*d^2*i^3*n^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/(b^3*g^3) - ( \\
& 5*B^2*d^2*(b*c - a*d)*i^3*n^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x \\
& ])/(b^4*g^3) - (2*B*c*d^2*i^3*n*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])* \text{Log}[ \\
& c + d*x])/(b^3*g^3) + (5*B*d^2*(b*c - a*d)*i^3*n*(A + B*\text{Log}[e*((a + b*x)/(c \\
& + d*x))^n])* \text{Log}[c + d*x])/(b^4*g^3) - (B^2*c*d^2*i^3*n^2*\text{Log}[c + d*x]^2)/( \\
& b^3*g^3) + (5*B^2*d^2*(b*c - a*d)*i^3*n^2*\text{Log}[c + d*x]^2)/(2*b^4*g^3) + (6* \\
& A*B*d^2*(b*c - a*d)*i^3*n*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)]/(b^4 \\
& *g^3) + (2*a*B^2*d^3*i^3*n^2*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)]/( \\
& b^4*g^3) - (5*B^2*d^2*(b*c - a*d)*i^3*n^2*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b \\
& *c - a*d)]/(b^4*g^3) + (6*A*B*d^2*(b*c - a*d)*i^3*n*\text{PolyLog}[2, -((d*(a + b \\
& *x))/(b*c - a*d))]/(b^4*g^3) + (2*a*B^2*d^3*i^3*n^2*\text{PolyLog}[2, -((d*(a + b \\
& *x))/(b*c - a*d))]/(b^4*g^3) - (5*B^2*d^2*(b*c - a*d)*i^3*n^2*\text{PolyLog}[2, - \\
& ((d*(a + b*x))/(b*c - a*d))]/(b^4*g^3) + (2*B^2*c*d^2*i^3*n^2*\text{PolyLog}[2, ( \\
& b*(c + d*x))/(b*c - a*d)]/(b^3*g^3) - (5*B^2*d^2*(b*c - a*d)*i^3*n^2*\text{PolyL \\
& og}[2, (b*(c + d*x))/(b*c - a*d)]/(b^4*g^3) + (6*B^2*d^2*(b*c - a*d)*i^3*n* \\
& \text{Log}[e*((a + b*x)/(c + d*x))^n]*\text{PolyLog}[2, 1 + (b*c - a*d)/(d*(a + b*x))]/( \\
& b^4*g^3) + (6*B^2*d^2*(b*c - a*d)*i^3*n^2*\text{PolyLog}[3, 1 + (b*c - a*d)/(d*(a \\
& + b*x))]/(b^4*g^3)
\end{aligned}$$

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]
] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]

```

### Rule 2523

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] := Simp[x*(a +
b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat

```



ionalFunctionQ[RFx, x] && IGtQ[n, 0]

### Rule 12

Int[(a\_)\*(u\_), x\_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b\_)\*(v\_) /; FreeQ[b, x]]

### Rule 2524

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^n)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

### Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*(RFx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]

### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_.) + (g\_.)\*(x\_))^(q\_.), x\_Symbol] := Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] := Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*

$(e*f - d*g), 0]$

### Rule 2391

$\text{Int}[\text{Log}[(c\_.) * ((d\_.) + (e\_.) * (x\_.)^{(n\_.)})] / (x\_.), x\_Symbol] \rightarrow -\text{Simp}[\text{PolyLog}[2, -(c * e * x^n)] / n, x] /;$   $\text{FreeQ}\{c, d, e, n\}, x\} \ \&\& \ \text{EqQ}[c * d, 1]$

### Rule 2525

$\text{Int}[(a\_.) + \text{Log}[(c\_.) * (\text{RFX}\_.)^{(p\_.)}] * (b\_.)]^{(n\_.)} * ((d\_.) + (e\_.) * (x\_.)^{(m\_.)}), x\_Symbol] \rightarrow \text{Simp}[(d + e * x)^{(m + 1)} * (a + b * \text{Log}[c * \text{RFX}^p])^n / (e * (m + 1)), x] - \text{Dist}[(b * n * p) / (e * (m + 1)), \text{Int}[\text{SimplifyIntegrand}[(d + e * x)^{(m + 1)} * (a + b * \text{Log}[c * \text{RFX}^p])^{(n - 1)} * D[\text{RFX}, x]) / \text{RFX}, x], x] /;$   $\text{FreeQ}\{a, b, c, d, e, m, p\}, x\} \ \&\& \ \text{RationalFunctionQ}[\text{RFX}, x] \ \&\& \ \text{IGtQ}[n, 0] \ \&\& \ (\text{EqQ}[n, 1] \ || \ \text{IntegerQ}[m]) \ \&\& \ \text{NeQ}[m, -1]$

### Rule 44

$\text{Int}[(a\_.) + (b\_.) * (x\_.)^{(m\_.)} * ((c\_.) + (d\_.) * (x\_.)^{(n\_.)}), x\_Symbol] \rightarrow \text{Int}[\text{ExpandIntegrand}[(a + b * x)^m * (c + d * x)^n, x], x] /;$   $\text{FreeQ}\{a, b, c, d\}, x\} \ \&\& \ \text{NeQ}[b * c - a * d, 0] \ \&\& \ \text{ILtQ}[m, 0] \ \&\& \ \text{IntegerQ}[n] \ \&\& \ !(\text{IGtQ}[n, 0] \ \&\& \ \text{LtQ}[m + n + 2, 0])$

### Rule 6688

$\text{Int}[u\_., x\_Symbol] \rightarrow \text{With}\{v = \text{SimplifyIntegrand}[u, x]\}, \text{Int}[v, x] /;$   $\text{SimplerIntegrandQ}[v, u, x]$

### Rule 6742

$\text{Int}[u\_., x\_Symbol] \rightarrow \text{With}\{v = \text{ExpandIntegrand}[u, x]\}, \text{Int}[v, x] /;$   $\text{SumQ}[v]$

### Rule 2411

$\text{Int}[(a\_.) + \text{Log}[(c\_.) * ((d\_.) + (e\_.) * (x\_.)^{(n\_.)})] * (b\_.)]^{(p\_.)} * ((f\_.) + (g\_.) * (x\_.)^{(q\_.)} * ((h\_.) + (i\_.) * (x\_.)^{(r\_.)}), x\_Symbol] \rightarrow \text{Dist}[1/e, \text{Subst}[\text{Int}[(g * x) / e]^q * ((e * h - d * i) / e + (i * x) / e)^r * (a + b * \text{Log}[c * x^n])^p, x], x, d + e * x] /;$   $\text{FreeQ}\{a, b, c, d, e, f, g, h, i, n, p, q, r\}, x\} \ \&\& \ \text{EqQ}[e * f - d * g, 0] \ \&\& \ (\text{IGtQ}[p, 0] \ || \ \text{IGtQ}[r, 0]) \ \&\& \ \text{IntegerQ}[2 * r]$

### Rule 2344

$\text{Int}[(a\_.) + \text{Log}[(c\_.) * (x\_.)^{(n\_.)}] * (b\_.)]^{(p\_.)} / ((x\_.) * ((d\_.) + (e\_.) * (x\_.)^{(m\_.)})), x\_Symbol] \rightarrow \text{Dist}[1/d, \text{Int}[(a + b * \text{Log}[c * x^n])^p / x, x], x] - \text{Dist}[e/d, \text{Int}[\text{SimplifyIntegrand}[(a + b * \text{Log}[c * x^n])^p, x], x], x]$

$(a + b \cdot \text{Log}[c \cdot x^n])^p / (d + e \cdot x), x, x$  /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

### Rule 2317

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^p)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

### Rule 2507

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.)\*Log[(i\_.)\*((j\_.)\*((g\_.) + (h\_.)\*(x\_))^(t\_.))^(u\_.)]\*(v\_), x\_Symbol] := With[{k = Simplify[v\*(a + b\*x)\*(c + d\*x)]}, Simp[(k\*Log[i\*(j\*(g + h\*x)^t)^u]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s + 1))/(p\*r\*(s + 1)\*(b\*c - a\*d)), x] - Dist[(k\*h\*t\*u)/(p\*r\*(s + 1)\*(b\*c - a\*d)), Int[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s + 1)/(g + h\*x), x], x] /; FreeQ[k, x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && NeQ[s, -1]

### Rule 2488

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.)/((g\_.) + (h\_.)\*(x\_)), x\_Symbol] := -Simp[(Log[-(b\*c - a\*d)/(d\*(a + b\*x))]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/h, x] + Dist[(p\*r\*s\*(b\*c - a\*d))/h, Int[(Log[-(b\*c - a\*d)/(d\*(a + b\*x))]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1))/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && EqQ[b\*g - a\*h, 0] && IGtQ[s, 0]

### Rule 2506

Int[Log[v\_]\*Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.)\*(u\_), x\_Symbol] := With[{g = Simplify[(v - 1)\*(c + d\*x)/(a + b\*x)], h = Simplify[u\*(a + b\*x)\*(c + d\*x)]}, -Simp[(h\*PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/(b\*c - a\*d), x] + Dist[h\*p\*r\*s, Int[(PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1))/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]

### Rule 6610

Int[(u\_)\*PolyLog[n\_, v\_], x\_Symbol] := With[{w = DerivativeDivides[v, u\*v, x]}, Simp[w\*PolyLog[n + 1, v], x] /; !FalseQ[w]] /; FreeQ[n, x]

Rubi steps

$$\begin{aligned}
\int \frac{(184c + 184dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ag + bgx)^3} dx &= \int \left( \frac{6229504d^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3g^3} + \frac{6229504(bc - ad)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3g^3(a + bx)} \right) dx \\
&= \frac{(6229504d^3) \int \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx}{b^3g^3} + \frac{(18688512d^2(bc - ad)^3) \int \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx}{b^4g^3(a + bx)} \\
&= \frac{6229504d^3x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3g^3} - \frac{3114752(bc - ad)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^4g^3(a + bx)} \\
&= \frac{6229504d^3x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3g^3} - \frac{3114752(bc - ad)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^4g^3(a + bx)} \\
&= \frac{6229504d^3x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3g^3} - \frac{3114752(bc - ad)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^4g^3(a + bx)} \\
&= \frac{6229504d^3x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3g^3} - \frac{3114752(bc - ad)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^4g^3(a + bx)} \\
&= -\frac{3114752B(bc - ad)^3n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^4g^3(a + bx)^2} - \frac{31147520Bd(bc - ad)^3n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^4g^3(a + bx)^2} \\
&= -\frac{18688512B^2d^2(bc - ad) \log(a + bx) \log^2 \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^4g^3} - \frac{3114752B^2d^2(bc - ad) \log(a + bx) \log^2 \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^4g^3} \\
&= -\frac{18688512B^2d^2(bc - ad) \log \left( -\frac{bc-ad}{d(a+bx)} \right) \log^2 \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^4g^3} - \frac{18688512B^2d^2(bc - ad) \log \left( -\frac{bc-ad}{d(a+bx)} \right) \log^2 \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^4g^3} \\
&= -\frac{1557376B^2(bc - ad)^3n^2}{b^4g^3(a + bx)^2} - \frac{28032768B^2d(bc - ad)^2n^2}{b^4g^3(a + bx)} - \frac{28032768B^2d(bc - ad)^2n^2}{b^4g^3(a + bx)} \\
&= -\frac{1557376B^2(bc - ad)^3n^2}{b^4g^3(a + bx)^2} - \frac{28032768B^2d(bc - ad)^2n^2}{b^4g^3(a + bx)} - \frac{28032768B^2d(bc - ad)^2n^2}{b^4g^3(a + bx)} \\
&= -\frac{1557376B^2(bc - ad)^3n^2}{b^4g^3(a + bx)^2} - \frac{28032768B^2d(bc - ad)^2n^2}{b^4g^3(a + bx)} - \frac{28032768B^2d(bc - ad)^2n^2}{b^4g^3(a + bx)}
\end{aligned}$$

**Mathematica [B]** time = 24.699, size = 6221, normalized size = 9.66

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((c*i + d*i*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(a*g + b*g*x)^3,x]
```

```
[Out] Result too large to show
```

**Maple [F]** time = 0.727, size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3}{(bgx + ag)^3} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x)
```

```
[Out] int((d*i*x+c*i)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x)
```

**Maxima [F]** time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x,
algorithm="maxima")
```

```
[Out] -3/2*A*B*c^2*d*i^3*n*((3*a*b*c - a^2*d + 2*(2*b^2*c - a*b*d)*x)/((b^5*c - a
*b^4*d)*g^3*x^2 + 2*(a*b^4*c - a^2*b^3*d)*g^3*x + (a^2*b^3*c - a^3*b^2*d)*g
^3) + 2*(2*b*c*d - a*d^2)*log(b*x + a)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^
2)*g^3) - 2*(2*b*c*d - a*d^2)*log(d*x + c)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^
2*d^2)*g^3)) + 1/2*A*B*c^3*i^3*n*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d
)*g^3*x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + 2*
d^2*log(b*x + a)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x
```

+ c)/((b^3\*c^2 - 2\*a\*b^2\*c\*d + a^2\*b\*d^2)\*g^3)) - 1/2\*A^2\*d^3\*i^3\*((6\*a^2\*b\*x + 5\*a^3)/(b^6\*g^3\*x^2 + 2\*a\*b^5\*g^3\*x + a^2\*b^4\*g^3) - 2\*x/(b^3\*g^3) + 6\*a\*log(b\*x + a)/(b^4\*g^3)) + 3/2\*A^2\*c\*d^2\*i^3\*((4\*a\*b\*x + 3\*a^2)/(b^5\*g^3\*x^2 + 2\*a\*b^4\*g^3\*x + a^2\*b^3\*g^3) + 2\*log(b\*x + a)/(b^3\*g^3)) - 3\*(2\*b\*x + a)\*A\*B\*c^2\*d\*i^3\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n)/(b^4\*g^3\*x^2 + 2\*a\*b^3\*g^3\*x + a^2\*b^2\*g^3) - 3/2\*(2\*b\*x + a)\*A^2\*c^2\*d\*i^3/(b^4\*g^3\*x^2 + 2\*a\*b^3\*g^3\*x + a^2\*b^2\*g^3) - A\*B\*c^3\*i^3\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n)/(b^3\*g^3\*x^2 + 2\*a\*b^2\*g^3\*x + a^2\*b\*g^3) - 1/2\*A^2\*c^3\*i^3/(b^3\*g^3\*x^2 + 2\*a\*b^2\*g^3\*x + a^2\*b\*g^3) + 1/2\*(2\*B^2\*b^3\*d^3\*i^3\*x^3 + 4\*B^2\*a\*b^2\*d^3\*i^3\*x^2 - 2\*(3\*b^3\*c^2\*d\*i^3 - 6\*a\*b^2\*c\*d^2\*i^3 + 2\*a^2\*b\*d^3\*i^3)\*B^2\*x - (b^3\*c^3\*i^3 + 3\*a\*b^2\*c^2\*d\*i^3 - 9\*a^2\*b\*c\*d^2\*i^3 + 5\*a^3\*d^3\*i^3)\*B^2 + 6\*((b^3\*c\*d^2\*i^3 - a\*b^2\*d^3\*i^3)\*B^2\*x^2 + 2\*(a\*b^2\*c\*d^2\*i^3 - a^2\*b\*d^3\*i^3)\*B^2\*x + (a^2\*b\*c\*d^2\*i^3 - a^3\*d^3\*i^3)\*B^2)\*log(b\*x + a)\*log((d\*x + c)^n)^2/(b^6\*g^3\*x^2 + 2\*a\*b^5\*g^3\*x + a^2\*b^4\*g^3) - integrate(-(4\*B^2\*b^4\*c^3\*d\*i^3\*x\*log(e)^2 + B^2\*b^4\*c^4\*i^3\*log(e)^2 + (B^2\*b^4\*d^4\*i^3\*log(e)^2 + 2\*A\*B\*b^4\*d^4\*i^3\*log(e))\*x^4 + 4\*(B^2\*b^4\*c\*d^3\*i^3\*log(e)^2 + 2\*A\*B\*b^4\*c\*d^3\*i^3\*log(e))\*x^3 + 6\*(B^2\*b^4\*c^2\*d^2\*i^3\*log(e)^2 + A\*B\*b^4\*c^2\*d^2\*i^3\*log(e))\*x^2 + (B^2\*b^4\*d^4\*i^3\*x^4 + 4\*B^2\*b^4\*c\*d^3\*i^3\*x^3 + 6\*B^2\*b^4\*c^2\*d^2\*i^3\*x^2 + 4\*B^2\*b^4\*c^3\*d\*i^3\*x + B^2\*b^4\*c^4\*i^3)\*log((b\*x + a)^n)^2 + 2\*(4\*B^2\*b^4\*c^3\*d\*i^3\*x\*log(e) + B^2\*b^4\*c^4\*i^3\*log(e) + (B^2\*b^4\*d^4\*i^3\*log(e) + A\*B\*b^4\*d^4\*i^3)\*x^4 + 4\*(B^2\*b^4\*c\*d^3\*i^3\*log(e) + A\*B\*b^4\*c\*d^3\*i^3)\*x^3 + 3\*(2\*B^2\*b^4\*c^2\*d^2\*i^3\*log(e) + A\*B\*b^4\*c^2\*d^2\*i^3)\*x^2)\*log((b\*x + a)^n) - (2\*(A\*B\*b^4\*d^4\*i^3 + (i^3\*n + i^3\*log(e))\*B^2\*b^4\*d^4)\*x^4 - (9\*a\*b^3\*c^2\*d^2\*i^3\*n - 21\*a^2\*b^2\*c\*d^3\*i^3\*n + 9\*a^3\*b\*d^4\*i^3\*n + (i^3\*n - 8\*i^3\*log(e))\*b^4\*c^3\*d)\*B^2\*x + 2\*(4\*A\*B\*b^4\*c\*d^3\*i^3 + (3\*a\*b^3\*d^4\*i^3\*n + 4\*b^4\*c\*d^3\*i^3\*log(e))\*B^2)\*x^3 - (a\*b^3\*c^3\*d\*i^3\*n + 3\*a^2\*b^2\*c^2\*d^2\*i^3\*n - 9\*a^3\*b\*c\*d^3\*i^3\*n + 5\*a^4\*d^4\*i^3\*n - 2\*b^4\*c^4\*i^3\*log(e))\*B^2 + 6\*(A\*B\*b^4\*c^2\*d^2\*i^3 + (2\*a\*b^3\*c\*d^3\*i^3\*n - (i^3\*n - 2\*i^3\*log(e))\*b^4\*c^2\*d^2)\*B^2)\*x^2 + 6\*((b^4\*c\*d^3\*i^3\*n - a\*b^3\*d^4\*i^3\*n)\*B^2\*x^3 + 3\*(a\*b^3\*c\*d^3\*i^3\*n - a^2\*b^2\*d^4\*i^3\*n)\*B^2\*x^2 + 3\*(a^2\*b^2\*c\*d^3\*i^3\*n - a^3\*b\*d^4\*i^3\*n)\*B^2\*x + (a^3\*b\*c\*d^3\*i^3\*n - a^4\*d^4\*i^3\*n)\*B^2)\*log(b\*x + a) + 2\*(B^2\*b^4\*d^4\*i^3\*x^4 + 4\*B^2\*b^4\*c\*d^3\*i^3\*x^3 + 6\*B^2\*b^4\*c^2\*d^2\*i^3\*x^2 + 4\*B^2\*b^4\*c^3\*d\*i^3\*x + B^2\*b^4\*c^4\*i^3)\*log((b\*x + a)^n)\*log((d\*x + c)^n)/(b^7\*d\*g^3\*x^4 + a^3\*b^4\*c\*g^3 + (b^7\*c\*g^3 + 3\*a\*b^6\*d\*g^3)\*x^3 + 3\*(a\*b^6\*c\*g^3 + a^2\*b^5\*d\*g^3)\*x^2 + (3\*a^2\*b^5\*c\*g^3 + a^3\*b^4\*d\*g^3)\*x), x)

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{A^2 d^3 i^3 x^3 + 3 A^2 c d^2 i^3 x^2 + 3 A^2 c^2 d i^3 x + A^2 c^3 i^3 + (B^2 d^3 i^3 x^3 + 3 B^2 c d^2 i^3 x^2 + 3 B^2 c^2 d i^3 x + B^2 c^3 i^3) \log \left( e^{\left( \frac{b x + a}{d x + c} \right)} \right)}{b^3 g^3 x^3 + 3 a b^2 g^3 x^2 + 3 a^2 b g^3 x + a^3 g^3}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x,
algorithm="fricas")
```

```
[Out] integral((A^2*d^3*i^3*x^3 + 3*A^2*c*d^2*i^3*x^2 + 3*A^2*c^2*d*i^3*x + A^2*c^3*i^3 + (B^2*d^3*i^3*x^3 + 3*B^2*c*d^2*i^3*x^2 + 3*B^2*c^2*d*i^3*x + B^2*c^3*i^3)*log(e*((b*x + a)/(d*x + c))^n))^2 + 2*(A*B*d^3*i^3*x^3 + 3*A*B*c*d^2*i^3*x^2 + 3*A*B*c^2*d*i^3*x + A*B*c^3*i^3)*log(e*((b*x + a)/(d*x + c))^n)) / (b^3*g^3*x^3 + 3*a*b^2*g^3*x^2 + 3*a^2*b*g^3*x + a^3*g^3), x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**3,x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3 \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2}{(bgx + ag)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x,
algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(b*g*x + a*g)^3, x)
```



$$3.185 \quad \int \frac{(ci+dx)^3 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ag+bgx)^4} dx$$

**Optimal.** Leaf size=561

$$\frac{2Bd^3i^3n \text{PolyLog} \left( 2, \frac{b(c+dx)}{d(a+bx)} \right) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{b^4g^4} + \frac{2B^2d^3i^3n^2 \text{PolyLog} \left( 3, \frac{b(c+dx)}{d(a+bx)} \right)}{b^4g^4} - \frac{d^2i^3(c+dx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{b^3g^4(a+bx)}$$

[Out]  $(-2*B^2*d^2*i^3*n^2*(c+d*x))/(b^3*g^4*(a+b*x)) - (B^2*d*i^3*n^2*(c+d*x)^2)/(4*b^2*g^4*(a+b*x)^2) - (2*B^2*i^3*n^2*(c+d*x)^3)/(27*b*g^4*(a+b*x)^3) - (2*B*d^2*i^3*n*(c+d*x)*(A+B*\text{Log}[e*((a+b*x)/(c+d*x))^n])/(b^3*g^4*(a+b*x)) - (B*d*i^3*n*(c+d*x)^2*(A+B*\text{Log}[e*((a+b*x)/(c+d*x))^n])/(2*b^2*g^4*(a+b*x)^2) - (2*B*i^3*n*(c+d*x)^3*(A+B*\text{Log}[e*((a+b*x)/(c+d*x))^n])/(9*b*g^4*(a+b*x)^3) - (d^2*i^3*(c+d*x)*(A+B*\text{Log}[e*((a+b*x)/(c+d*x))^n])^2)/(b^3*g^4*(a+b*x)) - (d*i^3*(c+d*x)^2*(A+B*\text{Log}[e*((a+b*x)/(c+d*x))^n])^2)/(2*b^2*g^4*(a+b*x)^2) - (i^3*(c+d*x)^3*(A+B*\text{Log}[e*((a+b*x)/(c+d*x))^n])^2)/(3*b*g^4*(a+b*x)^3) - (d^3*i^3*(A+B*\text{Log}[e*((a+b*x)/(c+d*x))^n])^2*\text{Log}[1-(b*(c+d*x))/(d*(a+b*x)])/(b^4*g^4) + (2*B*d^3*i^3*n*(A+B*\text{Log}[e*((a+b*x)/(c+d*x))^n])*\text{PolyLog}[2, (b*(c+d*x))/(d*(a+b*x))])/(b^4*g^4) + (2*B^2*d^3*i^3*n^2*\text{PolyLog}[3, (b*(c+d*x))/(d*(a+b*x))])/(b^4*g^4)$

**Rubi [B]** time = 5.09333, antiderivative size = 1170, normalized size of antiderivative = 2.09, number of steps used = 100, number of rules used = 20, integrand size = 45,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.444$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610}

$$\frac{11B^2d^3n^2 \log^2(a+bx)i^3}{6b^4g^4} - \frac{ABd^3n \log^2(a+bx)i^3}{b^4g^4} - \frac{B^2d^3 \log \left( -\frac{bc-ad}{d(a+bx)} \right) \log^2 \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) i^3}{b^4g^4} - \frac{B^2d^3 \log(a+bx) \log^2 \left( e \left( \frac{a}{c} \right) \right)}{b^4g^4}$$

Antiderivative was successfully verified.

[In] Int[((c\*i + d\*i\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(a\*g + b\*g\*x)^4,x]

[Out]  $(-2*B^2*(b*c - a*d)^3*i^3*n^2)/(27*b^4*g^4*(a+b*x)^3) - (17*B^2*d*(b*c - a*d)^2*i^3*n^2)/(36*b^4*g^4*(a+b*x)^2) - (49*B^2*d^2*(b*c - a*d)*i^3*n^2)/(18*b^4*g^4*(a+b*x)) - (49*B^2*d^3*i^3*n^2*\text{Log}[a+b*x])/(18*b^4*g^4) -$

$$\begin{aligned}
& (A*B*d^3*i^3*n*Log[a + b*x]^2)/(b^4*g^4) + (11*B^2*d^3*i^3*n^2*Log[a + b*x]^2)/(6*b^4*g^4) - (B^2*d^3*i^3*Log[-((b*c - a*d)/(d*(a + b*x))])*Log[e*((a + b*x)/(c + d*x))^n]^2)/(b^4*g^4) - (B^2*d^3*i^3*Log[a + b*x]*Log[e*((a + b*x)/(c + d*x))^n]^2)/(b^4*g^4) - (2*B*(b*c - a*d)^3*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(9*b^4*g^4*(a + b*x)^3) - (7*B*d*(b*c - a*d)^2*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*b^4*g^4*(a + b*x)^2) - (11*B*d^2*(b*c - a*d)*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b^4*g^4*(a + b*x)) - (11*B*d^3*i^3*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b^4*g^4) - ((b*c - a*d)^3*i^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(3*b^4*g^4*(a + b*x)^3) - (3*d*(b*c - a*d)^2*i^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*b^4*g^4*(a + b*x)^2) - (3*d^2*(b*c - a*d)*i^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(b^4*g^4*(a + b*x)) + (d^3*i^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(b^4*g^4) + (49*B^2*d^3*i^3*n^2*Log[c + d*x])/(18*b^4*g^4) - (11*B^2*d^3*i^3*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*b^4*g^4) + (11*B*d^3*i^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(3*b^4*g^4) + (11*B^2*d^3*i^3*n^2*Log[c + d*x]^2)/(6*b^4*g^4) + (2*A*B*d^3*i^3*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^4*g^4) - (11*B^2*d^3*i^3*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(3*b^4*g^4) + (2*A*B*d^3*i^3*n*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^4*g^4) - (11*B^2*d^3*i^3*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(3*b^4*g^4) - (11*B^2*d^3*i^3*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(3*b^4*g^4) + (2*B^2*d^3*i^3*n*Log[e*((a + b*x)/(c + d*x))^n]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^4*g^4) + (2*B^2*d^3*i^3*n^2*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^4*g^4)
\end{aligned}$$

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]
] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

```

### Rule 2525

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[ ((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[ ((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

```

### Rule 12

```

Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_) /; FreeQ[b, x]]

```

Rule 44

```
Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_) + Log[(c_)*(RFx_)^(p_)])*(b_)^(n_)/((d_) + (e_)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_))^(n_)])*(b_)^(p_)*(RFx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_))^(n_)])*(b_)^(p_)*((f_) + (g_
)*(x_))^(q_), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_) + Log[(c_)*(x_)^n])*(b_)/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_))^(n_)])*(b_)/((f_) + (g_)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_))])*(b_)/((f_) + (g_)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
```

], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] := -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rule 6688

Int[u\_, x\_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifyIntegrandQ[v, u, x]]

### Rule 6742

Int[u\_, x\_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]

### Rule 2411

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]\*(b\_.))^(p\_.)\*((f\_.) + (g\_.)\*(x\_)^(q\_.))\*((h\_.) + (i\_.)\*(x\_)^(r\_.)), x\_Symbol] := Dist[1/e, Subst[Int[((g\*x)/e)^q\*((e\*h - d\*i)/e + (i\*x)/e)^r\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e\*f - d\*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2\*r]

### Rule 2344

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/((x\_) \* ((d\_) + (e\_.)\*(x\_))), x\_Symbol] := Dist[1/d, Int[(a + b\*Log[c\*x^n])^p/x, x], x] - Dist[e/d, Int[(a + b\*Log[c\*x^n])^p/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

### Rule 2317

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/((d\_) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^p)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

### Rule 2507

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_)^(p\_.))\*((c\_.) + (d\_.)\*(x\_)^(q\_.))^(r\_.))^(s\_.)\*Log[(i\_.)\*((j\_.)\*((g\_.) + (h\_.)\*(x\_)^(t\_.))^(u\_.))\*v\_], x\_Symbol] := With[{k = Simplify[v\*(a + b\*x)\*(c + d\*x)]}, Simp[(k\*Log[i\*(j\*(g +

```

h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s + 1)/(p*r*(s + 1)*(b*c
- a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
EqQ[p + q, 0] && NeQ[s, -1]

```

### Rule 2488

```

Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] := -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]

```

### Rule 2506

```

Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] := With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]

```

### Rule 6610

```

Int[(u_)*PolyLog[n_, v_], x_Symbol] := With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /; !FalseQ[w]] /; FreeQ[n, x]

```

### Rubi steps

$$\begin{aligned}
\int \frac{(185c + 185dx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ag + bgx)^4} dx &= \int \left( \frac{6331625(bc - ad)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{b^3 g^4 (a + bx)^4} + \frac{18994875d(bc - ad)}{b^3 g^4} \right) dx \\
&= \frac{(6331625d^3) \int \frac{\left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{a+bx} dx}{b^3 g^4} + \frac{(18994875d^2(bc - ad)) \int \frac{\left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{a+bx} dx}{b^3 g^4} \\
&= -\frac{6331625(bc - ad)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3b^4 g^4 (a + bx)^3} - \frac{18994875d(bc - ad)^2}{2b^4 g^4} \\
&= -\frac{6331625(bc - ad)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3b^4 g^4 (a + bx)^3} - \frac{18994875d(bc - ad)^2}{2b^4 g^4} \\
&= -\frac{6331625(bc - ad)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3b^4 g^4 (a + bx)^3} - \frac{18994875d(bc - ad)^2}{2b^4 g^4} \\
&= -\frac{6331625(bc - ad)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{3b^4 g^4 (a + bx)^3} - \frac{18994875d(bc - ad)^2}{2b^4 g^4} \\
&= -\frac{12663250B(bc - ad)^3 n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{9b^4 g^4 (a + bx)^3} - \frac{44321375Bd(bc - ad)^2}{6b^4 g^4} \\
&= -\frac{6331625B^2 d^3 \log(a + bx) \log^2 \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^4 g^4} - \frac{12663250B(bc - ad)^3 n}{9b^4 g^4 (a + bx)^3} \\
&= -\frac{6331625B^2 d^3 \log \left( -\frac{bc-ad}{d(a+bx)} \right) \log^2 \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{b^4 g^4} - \frac{6331625B^2 d^3 \log(a + bx)}{b^4 g^4} \\
&= -\frac{12663250B^2 (bc - ad)^3 n^2}{27b^4 g^4 (a + bx)^3} - \frac{107637625B^2 d (bc - ad)^2 n^2}{36b^4 g^4 (a + bx)^2} - \frac{310249625B^2 d^2 (bc - ad) n^2}{18b^4 g^4} \\
&= -\frac{12663250B^2 (bc - ad)^3 n^2}{27b^4 g^4 (a + bx)^3} - \frac{107637625B^2 d (bc - ad)^2 n^2}{36b^4 g^4 (a + bx)^2} - \frac{310249625B^2 d^2 (bc - ad) n^2}{18b^4 g^4} \\
&= -\frac{12663250B^2 (bc - ad)^3 n^2}{27b^4 g^4 (a + bx)^3} - \frac{107637625B^2 d (bc - ad)^2 n^2}{36b^4 g^4 (a + bx)^2} - \frac{310249625B^2 d^2 (bc - ad) n^2}{18b^4 g^4}
\end{aligned}$$

**Mathematica [B]** time = 8.15392, size = 8775, normalized size = 15.64

Result too large to show

Antiderivative was successfully verified.

[In] Integrate[((c\*i + d\*i\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(a\*g + b\*g\*x)^4,x]

[Out] Result too large to show

**Maple [F]** time = 0.695, size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3}{(bgx + ag)^4} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*i\*x+c\*i)^3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^4,x)

[Out] int((d\*i\*x+c\*i)^3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^4,x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^4,x, algorithm="maxima")

[Out] 
$$-1/3*A*B*c*d^2*i^3*n*((11*a^2*b^2*c^2 - 7*a^3*b*c*d + 2*a^4*d^2 + 6*(3*b^4*c^2 - 3*a*b^3*c*d + a^2*b^2*d^2))*x^2 + 3*(9*a*b^3*c^2 - 7*a^2*b^2*c*d + 2*a^3*b*d^2)*x)/((b^8*c^2 - 2*a*b^7*c*d + a^2*b^6*d^2)*g^4*x^3 + 3*(a*b^7*c^2 - 2*a^2*b^6*c*d + a^3*b^5*d^2)*g^4*x^2 + 3*(a^2*b^6*c^2 - 2*a^3*b^5*c*d + a^4*b^4*d^2)*g^4*x + (a^3*b^5*c^2 - 2*a^4*b^4*c*d + a^5*b^3*d^2)*g^4) + 6*(3*b^2*c^2*d - 3*a*b*c*d^2 + a^2*d^3)*log(b*x + a)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^4) - 6*(3*b^2*c^2*d - 3*a*b*c*d^2 + a^2*d^3)$$

$$\begin{aligned}
& d^3) \log(dx + c) / ((b^6c^3 - 3ab^5c^2d + 3a^2b^4c^2d^2 - a^3b^3d^3) \\
& )g^4)) - 1/9ABc^3i^3n*((6b^2d^2x^2 + 2b^2c^2 - 7abc^2d + 11a^2 \\
& 2d^2 - 3(b^2cd - 5abd^2)x) / ((b^6c^2 - 2ab^5cd + a^2b^4d^2)g \\
& ^4x^3 + 3(ab^5c^2 - 2a^2b^4cd + a^3b^3d^2)g^4x^2 + 3(a^2b^4c \\
& ^2 - 2a^3b^3cd + a^4b^2d^2)g^4x + (a^3b^3c^2 - 2a^4b^2cd + a^5 \\
& 5bd^2)g^4) + 6d^3 \log(bx + a) / ((b^4c^3 - 3ab^3c^2d + 3a^2b^2c \\
& d^2 - a^3bd^3)g^4) - 6d^3 \log(dx + c) / ((b^4c^3 - 3ab^3c^2d + 3a^2 \\
& 2b^2cd^2 - a^3bd^3)g^4)) - 1/6ABc^2di^3n*((5ab^2c^2 - 22a^2 \\
& *bcd + 5a^3d^2 - 6(3b^3cd - ab^2d^2)x^2 + 3(3b^3c^2 - 16ab^2 \\
& 2cd + 5a^2bd^2)x) / ((b^7c^2 - 2ab^6cd + a^2b^5d^2)g^4x^3 + 3 \\
& (ab^6c^2 - 2a^2b^5cd + a^3b^4d^2)g^4x^2 + 3(a^2b^5c^2 - 2a^3b \\
& b^4cd + a^4b^3d^2)g^4x + (a^3b^4c^2 - 2a^4b^3cd + a^5b^2d^2) \\
& g^4) - 6(3b^3cd^2 - ad^3) \log(bx + a) / ((b^5c^3 - 3ab^4c^2d + 3a^2 \\
& *b^3cd^2 - a^3b^2d^3)g^4) + 6(3b^3cd^2 - ad^3) \log(dx + c) / ((b^5c \\
& ^3 - 3ab^4c^2d + 3a^2b^3cd^2 - a^3b^2d^3)g^4)) + 1/6A^2d^3i^3 \\
& *((18ab^2x^2 + 27a^2bx + 11a^3) / (b^7g^4x^3 + 3ab^6g^4x^2 + 3a \\
& ^2b^5g^4x + a^3b^4g^4) + 6 \log(bx + a) / (b^4g^4)) - (3bx + a)ABc \\
& ^2di^3 \log(e*(bx/(dx + c) + a/(dx + c))^n) / (b^5g^4x^3 + 3ab^4g^4x \\
& x^2 + 3a^2b^3g^4x + a^3b^2g^4) - 2(3b^2x^2 + 3abx + a^2)ABc^2 \\
& d^2i^3 \log(e*(bx/(dx + c) + a/(dx + c))^n) / (b^6g^4x^3 + 3ab^5g^4x \\
& ^2 + 3a^2b^4g^4x + a^3b^3g^4) - 1/2(3bx + a)A^2c^2di^3 / (b^5g^ \\
& 4x^3 + 3ab^4g^4x^2 + 3a^2b^3g^4x + a^3b^2g^4) - (3b^2x^2 + 3a \\
& *bx + a^2)A^2cd^2i^3 / (b^6g^4x^3 + 3ab^5g^4x^2 + 3a^2b^4g^4x \\
& + a^3b^3g^4) - 2/3ABc^3i^3 \log(e*(bx/(dx + c) + a/(dx + c))^n) / (b^ \\
& 4g^4x^3 + 3ab^3g^4x^2 + 3a^2b^2g^4x + a^3bg^4) - 1/3A^2c^3i^ \\
& 3 / (b^4g^4x^3 + 3ab^3g^4x^2 + 3a^2b^2g^4x + a^3bg^4) - 1/6(18( \\
& b^3cd^2i^3 - ab^2d^3i^3)B^2x^2 + 9(b^3c^2di^3 + 2ab^2cd^2i \\
& ^3 - 3a^2bd^3i^3)B^2x + (2b^3c^3i^3 + 3ab^2c^2di^3 + 6a^2b^ \\
& cd^2i^3 - 11a^3d^3i^3)B^2 - 6(B^2b^3d^3i^3x^3 + 3B^2ab^2d^3i \\
& ^3x^2 + 3B^2a^2bd^3i^3x + B^2a^3d^3i^3) \log(bx + a)) \log((dx + \\
& c)^n)^2 / (b^7g^4x^3 + 3ab^6g^4x^2 + 3a^2b^5g^4x + a^3b^4g^4) - \\
& \text{integrate}(-1/3(18B^2b^4c^2d^2i^3x^2 \log(e)^2 + 12B^2b^4c^3di^3 \\
& x \log(e)^2 + 3B^2b^4c^4i^3 \log(e)^2 + 3(B^2b^4d^4i^3 \log(e)^2 + 2A \\
& *Bb^4d^4i^3 \log(e))x^4 + 6(2B^2b^4cd^3i^3 \log(e)^2 + ABb^4cd^ \\
& 3i^3 \log(e))x^3 + 3(B^2b^4d^4i^3x^4 + 4B^2b^4cd^3i^3x^3 + 6B^ \\
& 2b^4c^2d^2i^3x^2 + 4B^2b^4c^3di^3x + B^2b^4c^4i^3) \log((bx + \\
& a)^n)^2 + 6(6B^2b^4c^2d^2i^3x^2 \log(e) + 4B^2b^4c^3di^3x \log( \\
& e) + B^2b^4c^4i^3 \log(e) + (B^2b^4d^4i^3 \log(e) + ABb^4d^4i^3)x^ \\
& 4 + (4B^2b^4cd^3i^3 \log(e) + ABb^4cd^3i^3)x^3) \log((bx + a)^n) \\
& + (9(4ab^3cd^3i^3n - 5a^2b^2d^4i^3n + (i^3n - 4i^3 \log(e))b^ \\
& 4c^2d^2)B^2x^2 - 6(B^2b^4d^4i^3 \log(e) + ABb^4d^4i^3)x^4 + 2( \\
& 6ab^3c^2d^2i^3n + 12a^2b^2cd^3i^3n - 19a^3bd^4i^3n + (i^3n \\
& - 12i^3 \log(e))b^4c^3d)B^2x - 6(ABb^4cd^3i^3 + (3ab^3d^4i \\
& ^3n - (3i^3n - 4i^3 \log(e))b^4cd^3)B^2)x^3 + (2ab^3c^3di^3n \\
& + 3a^2b^2c^2d^2i^3n + 6a^3b^3cd^3i^3n - 11a^4d^4i^3n - 6b^4*
\end{aligned}$$



$$c^4 i^3 \log(e) B^2 - 6(B^2 b^4 d^4 i^3 n x^4 + 4B^2 a b^3 d^4 i^3 n x^3 + 6B^2 a^2 b^2 d^4 i^3 n x^2 + 4B^2 a^3 b d^4 i^3 n x + B^2 a^4 d^4 i^3 n) \log(bx + a) - 6(B^2 b^4 d^4 i^3 x^4 + 4B^2 b^4 c d^3 i^3 x^3 + 6B^2 b^4 c^2 d^2 i^3 x^2 + 4B^2 b^4 c^3 d i^3 x + B^2 b^4 c^4 i^3) \log((bx + a)^n) \log((dx + c)^n) / (b^8 d^4 g^4 x^5 + a^4 b^4 c g^4 + (b^8 c g^4 + 4a b^7 d g^4) x^4 + 2(2a b^7 c g^4 + 3a^2 b^6 d g^4) x^3 + 2(3a^2 b^6 c g^4 + 2a^3 b^5 d g^4) x^2 + (4a^3 b^5 c g^4 + a^4 b^4 d g^4) x), x$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{A^2 d^3 i^3 x^3 + 3 A^2 c d^2 i^3 x^2 + 3 A^2 c^2 d i^3 x + A^2 c^3 i^3 + (B^2 d^3 i^3 x^3 + 3 B^2 c d^2 i^3 x^2 + 3 B^2 c^2 d i^3 x + B^2 c^3 i^3) \log\left(e \left(\frac{bx+a}{dx+c}\right)\right)}{b^4 g^4 x^4 + 4 a b^3 g^4 x^3 + 6 a^2 b^2 g^4 x^2 + 4 a^3 b g^4}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^4,x,  
algorithm="fricas")

[Out] integral((A^2\*d^3\*i^3\*x^3 + 3\*A^2\*c\*d^2\*i^3\*x^2 + 3\*A^2\*c^2\*d\*i^3\*x + A^2\*c^3\*i^3 + (B^2\*d^3\*i^3\*x^3 + 3\*B^2\*c\*d^2\*i^3\*x^2 + 3\*B^2\*c^2\*d\*i^3\*x + B^2\*c^3\*i^3)\*log(e\*((b\*x + a)/(d\*x + c))^n))^2 + 2\*(A\*B\*d^3\*i^3\*x^3 + 3\*A\*B\*c\*d^2\*i^3\*x^2 + 3\*A\*B\*c^2\*d\*i^3\*x + A\*B\*c^3\*i^3)\*log(e\*((b\*x + a)/(d\*x + c))^n)) / (b^4\*g^4\*x^4 + 4\*a\*b^3\*g^4\*x^3 + 6\*a^2\*b^2\*g^4\*x^2 + 4\*a^3\*b\*g^4\*x + a^4\*g^4), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*i\*x+c\*i)\*\*3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c)\*\*n))\*\*2/(b\*g\*x+a\*g)\*\*4,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dix + ci)^3 \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2}{(bgx + ag)^4} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*i*x+c*i)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x,
algorithm="giac")
```

```
[Out] integrate((d*i*x + c*i)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(b*g*x +
a*g)^4, x)
```

$$3.186 \quad \int \frac{(ag+bgx)^3 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{ci+dx} dx$$

**Optimal.** Leaf size=768

$$\frac{2Bg^3n(bc-ad)^3 \text{PolyLog} \left( 2, \frac{d(a+bx)}{b(c+dx)} \right) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{d^4i} + \frac{6B^2g^3n^2(bc-ad)^3 \text{PolyLog} \left( 2, \frac{d(a+bx)}{b(c+dx)} \right)}{d^4i} + \frac{7B^2g^3n^2(bc-ad)^3 \text{PolyLog} \left( 3, \frac{d(a+bx)}{b(c+dx)} \right)}{d^4i}$$

```
[Out] (b*B^2*(b*c - a*d)^2*g^3*n^2*x)/(3*d^3*i) + (7*B*(b*c - a*d)^2*g^3*n*(a + b
*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(3*d^3*i) - (b^2*B*(b*c - a*d)*
g^3*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(3*d^4*i) + (3*(b
*c - a*d)^2*g^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(d^3*i)
- (3*b^2*(b*c - a*d)*g^3*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
)^2)/(2*d^4*i) + (b^3*g^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
)^2)/(3*d^4*i) + (6*B*(b*c - a*d)^3*g^3*n*(A + B*Log[e*((a + b*x)/(c + d*x)
])^n)*Log[(b*c - a*d)/(b*(c + d*x))]/(d^4*i) + ((b*c - a*d)^3*g^3*(A + B*L
og[e*((a + b*x)/(c + d*x))^n])^2*Log[(b*c - a*d)/(b*(c + d*x))]/(d^4*i) +
(B^2*(b*c - a*d)^3*g^3*n^2*Log[(a + b*x)/(c + d*x)]/(3*d^4*i) - (2*B^2*(b*c
- a*d)^3*g^3*n^2*Log[c + d*x]/(d^4*i) - (7*B*(b*c - a*d)^3*g^3*n*(A + B*
Log[e*((a + b*x)/(c + d*x))^n])*Log[1 - (b*(c + d*x))/(d*(a + b*x))]/(3*d^
4*i) + (6*B^2*(b*c - a*d)^3*g^3*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))]
)/(d^4*i) + (2*B*(b*c - a*d)^3*g^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
)*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))]/(d^4*i) + (7*B^2*(b*c - a*d)^3*g^
3*n^2*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))]/(3*d^4*i) - (2*B^2*(b*c - a*
d)^3*g^3*n^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))]/(d^4*i)
```

**Rubi [B]** time = 5.58543, antiderivative size = 1952, normalized size of antiderivative = 2.54, number of steps used = 101, number of rules used = 28, integrand size = 45,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.622$ , Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 2486, 31, 43, 6688, 6742, 2499, 2396, 2433, 2374, 6589, 2302, 30, 2500, 2375, 2317, 2440, 2434}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i + d*i*x
),x]
```

```
[Out] (5*A*b*B*(b*c - a*d)^2*g^3*n*x)/(3*d^3*i) + (b*B^2*(b*c - a*d)^2*g^3*n^2*x)
/(3*d^3*i) - (a*B^2*(b*c - a*d)^2*g^3*n^2*Log[a + b*x]^2)/(d^3*i) + (5*B^2*
```

$$\begin{aligned}
& (b*c - a*d)^2*g^3*n*(a + b*x)*\text{Log}[e*((a + b*x)/(c + d*x))^n]/(3*d^3*i) - ( \\
& B*(b*c - a*d)*g^3*n*(a + b*x)^2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]))/(3* \\
& d^2*i) + (2*a*B*(b*c - a*d)^2*g^3*n*\text{Log}[a + b*x]*(A + B*\text{Log}[e*((a + b*x)/(c \\
& + d*x))^n]))/(d^3*i) + (b*(b*c - a*d)^2*g^3*x*(A + B*\text{Log}[e*((a + b*x)/(c + \\
& d*x))^n])^2)/(d^3*i) - ((b*c - a*d)*g^3*(a + b*x)^2*(A + B*\text{Log}[e*((a + b*x) \\
& )/(c + d*x))^n])^2)/(2*d^2*i) + (g^3*(a + b*x)^3*(A + B*\text{Log}[e*((a + b*x)/(c \\
& + d*x))^n])^2)/(3*d*i) - (2*B^2*(b*c - a*d)^3*g^3*n^2*\text{Log}[c + d*x])/(d^4*i \\
& ) + (2*b*B^2*c*(b*c - a*d)^2*g^3*n^2*\text{Log}[-(d*(a + b*x))/(b*c - a*d)]*\text{Log}[ \\
& c + d*x])/(d^4*i) + (5*B^2*(b*c - a*d)^3*g^3*n^2*\text{Log}[-(d*(a + b*x))/(b*c - \\
& a*d)]*\text{Log}[c + d*x])/(3*d^4*i) - (2*b*B*c*(b*c - a*d)^2*g^3*n*(A + B*\text{Log}[e \\
& *((a + b*x)/(c + d*x))^n])*\text{Log}[c + d*x])/(d^4*i) - (5*B*(b*c - a*d)^3*g^3*n \\
& *(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])*\text{Log}[c + d*x])/(3*d^4*i) - (b*B^2*c* \\
& (b*c - a*d)^2*g^3*n^2*\text{Log}[c + d*x]^2)/(d^4*i) - (5*B^2*(b*c - a*d)^3*g^3*n^ \\
& 2*\text{Log}[c + d*x]^2)/(6*d^4*i) + (2*a*B^2*(b*c - a*d)^2*g^3*n^2*\text{Log}[a + b*x]*L \\
& og[(b*(c + d*x))/(b*c - a*d)]/(d^3*i) - (B^2*(b*c - a*d)^3*g^3*\text{Log}[(a + b* \\
& x)^n]^2*\text{Log}[(b*(c + d*x))/(b*c - a*d)]/(d^4*i) + (B^2*(b*c - a*d)^3*g^3*Lo \\
& g[(a + b*x)^n]^2*\text{Log}[i*(c + d*x)]/(d^4*i) - (A*B*(b*c - a*d)^3*g^3*n*\text{Log}[i \\
& *(c + d*x)]^2)/(d^4*i) + (B^2*(b*c - a*d)^3*g^3*n^2*\text{Log}[a + b*x]*\text{Log}[i*(c + \\
& d*x)]^2)/(d^4*i) - (B^2*(b*c - a*d)^3*g^3*n^2*\text{Log}[-(d*(a + b*x))/(b*c - a \\
& *d)]*\text{Log}[i*(c + d*x)]^2)/(d^4*i) - (B^2*(b*c - a*d)^3*g^3*n^2*\text{Log}[i*(c + d \\
& *x)]^3)/(3*d^4*i) + (2*B^2*(b*c - a*d)^3*g^3*n*\text{Log}[a + b*x]*\text{Log}[i*(c + d*x) \\
& ]*\text{Log}[(c + d*x)^(-n)]/(d^4*i) + (B^2*(b*c - a*d)^3*g^3*\text{Log}[a + b*x]*\text{Log}[(c \\
& + d*x)^(-n)]^2)/(d^4*i) - (B^2*(b*c - a*d)^3*g^3*\text{Log}[-(d*(a + b*x))/(b*c \\
& - a*d)]*\text{Log}[(c + d*x)^(-n)]^2)/(d^4*i) + (2*A*B*(b*c - a*d)^3*g^3*n*\text{Log}[-( \\
& (d*(a + b*x))/(b*c - a*d)]*\text{Log}[c*i + d*i*x])/(d^4*i) - ((b*c - a*d)^3*g^3* \\
& (A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2*\text{Log}[c*i + d*i*x])/(d^4*i) - (2*B^2 \\
& *(b*c - a*d)^3*g^3*n*\text{Log}[-(d*(a + b*x))/(b*c - a*d)]*(\text{Log}[(a + b*x)^n] - \\
& \text{Log}[e*((a + b*x)/(c + d*x))^n] + \text{Log}[(c + d*x)^(-n)])*\text{Log}[c*i + d*i*x])/(d^ \\
& 4*i) + (B^2*(b*c - a*d)^3*g^3*n^2*\text{Log}[-(d*(a + b*x))/(b*c - a*d)]*\text{Log}[c*i \\
& + d*i*x]^2)/(d^4*i) - (B^2*(b*c - a*d)^3*g^3*n*\text{Log}[e*((a + b*x)/(c + d*x)) \\
& ^n]*\text{Log}[c*i + d*i*x]^2)/(d^4*i) + (2*a*B^2*(b*c - a*d)^2*g^3*n^2*\text{PolyLog}[2, \\
& -(d*(a + b*x))/(b*c - a*d)]/(d^3*i) - (2*B^2*(b*c - a*d)^3*g^3*n*\text{Log}[(a \\
& + b*x)^n]*\text{PolyLog}[2, -(d*(a + b*x))/(b*c - a*d)]/(d^4*i) + (2*A*B*(b*c \\
& - a*d)^3*g^3*n*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]/(d^4*i) + (2*b*B^2*c* \\
& (b*c - a*d)^2*g^3*n^2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]/(d^4*i) + (5*B \\
& ^2*(b*c - a*d)^3*g^3*n^2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]/(3*d^4*i) + \\
& (2*B^2*(b*c - a*d)^3*g^3*n*\text{Log}[(c + d*x)^(-n)]*\text{PolyLog}[2, (b*(c + d*x))/(b \\
& *c - a*d)]/(d^4*i) - (2*B^2*(b*c - a*d)^3*g^3*n*(\text{Log}[(a + b*x)^n] - \text{Log}[e* \\
& ((a + b*x)/(c + d*x))^n] + \text{Log}[(c + d*x)^(-n)])*\text{PolyLog}[2, (b*(c + d*x))/(b \\
& *c - a*d)]/(d^4*i) + (2*B^2*(b*c - a*d)^3*g^3*n^2*\text{PolyLog}[3, -(d*(a + b*x) \\
& )/(b*c - a*d)]/(d^4*i) + (2*B^2*(b*c - a*d)^3*g^3*n^2*\text{PolyLog}[3, (b*(c + \\
& d*x))/(b*c - a*d)]/(d^4*i)
\end{aligned}$$

Rule 2528

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2523

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.), x_Symbol] := Simp[x*(a +
b*Log[c*Rfx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(Rfx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, Rfx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
Rfx, x] && IntegerQ[p]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]/(x\_), x\_Symbol] := -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rule 2525

Int[((a\_.) + Log[(c\_.)\*(RFX\_)^(p\_.)]\*(b\_.))^(n\_.)\*((d\_.) + (e\_.)\*(x\_))^(m\_.), x\_Symbol] := Simp[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFX^p])^n)/(e\*(m + 1)), x] - Dist[(b\*n\*p)/(e\*(m + 1)), Int[SimplifyIntegrand[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFX^p])^(n - 1)\*D[RFX, x])/RFX, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

### Rule 2486

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.)]^(r\_.)]^(s\_.), x\_Symbol] := Simp[((a + b\*x)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/b, x] + Dist[(q\*r\*s\*(b\*c - a\*d))/b, Int[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s - 1)/(c + d\*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]

### Rule 31

Int[((a\_) + (b\_.)\*(x\_))^(n\_), x\_Symbol] := Simp[Log[RemoveContent[a + b\*x, x]]/b, x] /; FreeQ[{a, b}, x]

### Rule 43

Int[((a\_.) + (b\_.)\*(x\_))^(m\_.)\*((c\_.) + (d\_.)\*(x\_))^(n\_.), x\_Symbol] := Int[ExpandIntegrand[(a + b\*x)^m\*(c + d\*x)^n, x], x] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b\*c - a\*d, 0] && IGtQ[m, 0] && (!IntegerQ[n] || (EqQ[c, 0] && Le

$Q[7*m + 4*n + 4, 0] \parallel LtQ[9*m + 5*(n + 1), 0] \parallel GtQ[m + n + 2, 0]$

### Rule 6688

`Int[u_, x_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifyIntegrandQ[v, u, x]]`

### Rule 6742

`Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]`

### Rule 2499

`Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.)]^(r_.))*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.) + (k_.)*(x_)), x_Symbol] := Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r)/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dist[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]`

### Rule 2396

`Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]`

### Rule 2433

`Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.))*((f_.) + Log[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Symbol] := Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(e*i - d*j)/e + (j*x)/e]^m), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]`

### Rule 2374

`Int[(Log[(d_.)*((e_) + (f_.)*(x_))^(m_.))]*((a_.) + Log[(c_.)*(x_))^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] := -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]`

&& EqQ[d\*e, 1]

### Rule 6589

Int[PolyLog[n\_, (c\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)]/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] :> Simp[PolyLog[n + 1, c\*(a + b\*x)^p]/(e\*p), x] /; FreeQ[{a, b, c, d, e, n, p}, x] && EqQ[b\*d, a\*e]

### Rule 2302

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/(x\_), x\_Symbol] :> Dist[1/(b\*n), Subst[Int[x^p, x], x, a + b\*Log[c\*x^n]], x] /; FreeQ[{a, b, c, n, p}, x]

### Rule 30

Int[(x\_)^(m\_.), x\_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && NeQ[m, -1]

### Rule 2500

Int[(Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.)]^(r\_.)]\*((s\_.) + Log[(i\_.)\*((g\_.) + (h\_.)\*(x\_))^(n\_.)]\*(t\_.)))/((j\_.) + (k\_.)\*(x\_)), x\_Symbol] :> Dist[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q)^r] - Log[(a + b\*x)^(p\*r)] - Log[(c + d\*x)^(q\*r)], Int[(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x], x] + (Int[(Log[(a + b\*x)^(p\*r)]\*(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x] + Int[(Log[(c + d\*x)^(q\*r)]\*(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0]

### Rule 2375

Int[(Log[(d\_.)\*((e\_.) + (f\_.)\*(x\_)^(m\_.))^(r\_.)]\*((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.))/(x\_), x\_Symbol] :> Simp[(Log[d\*(e + f\*x^m)^r]\*(a + b\*Log[c\*x^n])^(p + 1))/(b\*n\*(p + 1)), x] - Dist[(f\*m\*r)/(b\*n\*(p + 1)), Int[(x^(m - 1)\*(a + b\*Log[c\*x^n])^(p + 1))/(e + f\*x^m), x], x] /; FreeQ[{a, b, c, d, e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d\*e, 1]

### Rule 2317

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] :> Simp[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^p)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]



Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n)]*(f +
g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n)]*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n))]/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m))]/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{(ag + bgx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{186c + 186dx} dx &= \int \left( \frac{b(bc - ad)^2 g^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{186d^3} + \frac{(-bc + ad)^3 g^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{d^3(186c + 186dx)} \right) dx \\
&= \frac{(bg) \int (ag + bgx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx}{186d} - \frac{(b(bc - ad)g^2) \int (ag + bgx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx}{372d^2} \\
&= \frac{b(bc - ad)^2 g^3 x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{186d^3} - \frac{(bc - ad)g^3 (a + bx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{372d^2} \\
&= \frac{b(bc - ad)^2 g^3 x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{186d^3} - \frac{(bc - ad)g^3 (a + bx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{372d^2} \\
&= \frac{b(bc - ad)^2 g^3 x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{186d^3} - \frac{(bc - ad)g^3 (a + bx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{372d^2} \\
&= \frac{b(bc - ad)^2 g^3 x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{186d^3} - \frac{(bc - ad)g^3 (a + bx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{372d^2} \\
&= \frac{5AbB(bc - ad)^2 g^3 nx}{558d^3} - \frac{B(bc - ad)g^3 n(a + bx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{558d^2} + \dots \\
&= \frac{5AbB(bc - ad)^2 g^3 nx}{558d^3} + \frac{5B^2(bc - ad)^2 g^3 n(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{558d^3} - \frac{B(bc - ad)g^3 n(a + bx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{558d^2} \\
&= \frac{5AbB(bc - ad)^2 g^3 nx}{558d^3} + \frac{5B^2(bc - ad)^2 g^3 n(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{558d^3} - \frac{B(bc - ad)g^3 n(a + bx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{558d^2} \\
&= \frac{5AbB(bc - ad)^2 g^3 nx}{558d^3} + \frac{bB^2(bc - ad)^2 g^3 n^2 x}{558d^3} + \frac{5B^2(bc - ad)^2 g^3 n(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{558d^3} \\
&= \frac{5AbB(bc - ad)^2 g^3 nx}{558d^3} + \frac{bB^2(bc - ad)^2 g^3 n^2 x}{558d^3} - \frac{aB^2(bc - ad)^2 g^3 n^2 \log^2(a + bx)}{186d^3} \\
&= \frac{5AbB(bc - ad)^2 g^3 nx}{558d^3} + \frac{bB^2(bc - ad)^2 g^3 n^2 x}{558d^3} - \frac{aB^2(bc - ad)^2 g^3 n^2 \log^2(a + bx)}{186d^3}
\end{aligned}$$

**Mathematica [B]** time = 4.22203, size = 3265, normalized size = 4.25

Result too large to show

Antiderivative was successfully verified.

[In] Integrate[((a\*g + b\*g\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(c\*i + d\*i\*x), x]

[Out]  $(g^3*(6*b*d*(b^2*c^2 - 3*a*b*c*d + 3*a^2*d^2)*x*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n] - B*n*\text{Log}[(a + b*x)/(c + d*x)])^2 - 3*b^2*d^2*(b*c - 3*a*d)*x^2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n] - B*n*\text{Log}[(a + b*x)/(c + d*x)])^2 + 2*b^3*d^3*x^3*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n] - B*n*\text{Log}[(a + b*x)/(c + d*x)])^2 - 6*(b*c - a*d)^3*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n] - B*n*\text{Log}[(a + b*x)/(c + d*x)])^2*\text{Log}[c + d*x] + 18*a*B*d*n*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n] - B*n*\text{Log}[(a + b*x)/(c + d*x)])*(-2*b^2*c^2 + 2*a*b*c*d - b^2*c*d*x + a*b*d^2*x + 2*b^2*c^2*\text{Log}[c/d + x] - b^2*c^2*\text{Log}[c/d + x]^2 - a^2*d^2*\text{Log}[a + b*x] - 2*b^2*c*d*x*\text{Log}[(a + b*x)/(c + d*x)] + b^2*d^2*x^2*\text{Log}[(a + b*x)/(c + d*x)] + b^2*c^2*\text{Log}[c + d*x] + 2*b^2*c^2*\text{Log}[c/d + x]*\text{Log}[c + d*x] + 2*b^2*c^2*\text{Log}[(a + b*x)/(c + d*x)]*\text{Log}[c + d*x] - 2*b*c*\text{Log}[a/b + x]*(a*d + b*c*\text{Log}[c + d*x] - b*c*\text{Log}[(b*(c + d*x))/(b*c - a*d)]) + 2*b^2*c^2*\text{PolyLog}[2, (d*(a + b*x))/(-b*c + a*d)] - 2*B*n*(-A - B*\text{Log}[e*((a + b*x)/(c + d*x))^n] + B*n*\text{Log}[(a + b*x)/(c + d*x)])*(6*b^3*c^3 - 6*a*b^2*c^2*d + 5*b^3*c^2*d*x - 3*a*b^2*c*d^2*x - 2*a^2*b*d^3*x - b^3*c*d^2*x^2 + a*b^2*d^3*x^2 - 6*b^3*c^3*\text{Log}[c/d + x] + 3*b^3*c^3*\text{Log}[c/d + x]^2 + 3*a^2*b*c*d^2*\text{Log}[a + b*x] + 2*a^3*d^3*\text{Log}[a + b*x] + 6*b^3*c^2*d*x*\text{Log}[(a + b*x)/(c + d*x)] - 3*b^3*c*d^2*x^2*\text{Log}[(a + b*x)/(c + d*x)] + 2*b^3*d^3*x^3*\text{Log}[(a + b*x)/(c + d*x)] - 5*b^3*c^3*\text{Log}[c + d*x] - 6*b^3*c^3*\text{Log}[c/d + x]*\text{Log}[c + d*x] - 6*b^3*c^3*\text{Log}[(a + b*x)/(c + d*x)]*\text{Log}[c + d*x] + 6*b^2*c^2*\text{Log}[a/b + x]*(a*d + b*c*\text{Log}[c + d*x] - b*c*\text{Log}[(b*(c + d*x))/(b*c - a*d)]) - 6*b^3*c^3*\text{PolyLog}[2, (d*(a + b*x))/(-b*c + a*d)] - 6*a^3*B*d^3*n*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n] - B*n*\text{Log}[(a + b*x)/(c + d*x)])*(\text{Log}[c/d + x]^2 + 2*(\text{Log}[a/b + x] - \text{Log}[c/d + x] - \text{Log}[(a + b*x)/(c + d*x)])*\text{Log}[c + d*x] - 2*(\text{Log}[a/b + x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)] + \text{PolyLog}[2, (d*(a + b*x))/(-b*c + a*d)])) - 18*a^2*B*d^2*n*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n] - B*n*\text{Log}[(a + b*x)/(c + d*x)])*(-2*d*(a + b*x)*(-1 + \text{Log}[a/b + x]) + 2*b*(c + d*x)*(-1 + \text{Log}[c/d + x]) - b*c*\text{Log}[c/d + x]^2 + 2*b*(\text{Log}[a/b + x] - \text{Log}[c/d + x] - \text{Log}[(a + b*x)/(c + d*x)])*(d*x - c*\text{Log}[c + d*x]) + 2*b*c*(\text{Log}[a/b + x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)] + \text{PolyLog}[2, (d*(a + b*x))/(-b*c + a*d)])) + 18*a^2*B^2*d^2*n^2*(d*(a + b*x)*\text{Log}[(a + b*x)/(c + d*x)]^2 + b*c*\text{Log}[(a + b*x)/(c + d*x)]^2*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] - (b*c - a*d)*(\text{Log}[(b*c - a*d)/(b*c + b*d*x)]*(2*\text{Log}[(d*(a + b*x))/(-b*c + a*d)] - 2*\text{Log}[(a + b*x)/(c + d*x)] + \text{Log}[(b*c - a*d)/(b*c + b*d*x)]) - 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)] + 2*b*c*(\text{Log}[(a + b*x)/(c + d*x)]*\text{PolyLog}[2, (d*(a + b*x))/(b$

$$\begin{aligned}
& *(c + d*x))] - \text{PolyLog}[3, (d*(a + b*x))/(b*(c + d*x))]) + 9*a*B^2*d*n^2*(2 \\
& *d*(-(b*c) + a*d)*(a + b*x)*\text{Log}[(a + b*x)/(c + d*x)] - 2*a^2*d^2*\text{Log}[a + b* \\
& x]*\text{Log}[(a + b*x)/(c + d*x)] + b^2*d^2*x^2*\text{Log}[(a + b*x)/(c + d*x)]^2 - 2*b* \\
& c*d*(a + b*x)*\text{Log}[(a + b*x)/(c + d*x)]^2 + 2*(b*c - a*d)^2*\text{Log}[c + d*x] - 2 \\
& *b^2*c^2*\text{Log}[(a + b*x)/(c + d*x)]*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] - 2*b^2*c^2 \\
& *2*\text{Log}[(a + b*x)/(c + d*x)]^2*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] + a^2*d^2*(\text{Log}[ \\
& a + b*x]*(\text{Log}[a + b*x] - 2*\text{Log}[(b*(c + d*x))/(b*c - a*d)]) - 2*\text{PolyLog}[2, ( \\
& d*(a + b*x))/(-(b*c) + a*d)]) + b^2*c^2*(\text{Log}[(b*c - a*d)/(b*c + b*d*x)]*(2* \\
& \text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] + \text{Log}[(b*c - a*d)/(b*c + b*d*x)]) - 2*\text{Poly} \\
& \text{Log}[2, (b*(c + d*x))/(b*c - a*d)]) + 2*b*c*(b*c - a*d)*(\text{Log}[(b*c - a*d)/(b \\
& *c + b*d*x)]*(2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] - 2*\text{Log}[(a + b*x)/(c + d* \\
& x)] + \text{Log}[(b*c - a*d)/(b*c + b*d*x)]) - 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a \\
& *d)]) - 4*b^2*c^2*(\text{Log}[(a + b*x)/(c + d*x)]*\text{PolyLog}[2, (d*(a + b*x))/(b*(c \\
& + d*x))]) - \text{PolyLog}[3, (d*(a + b*x))/(b*(c + d*x))]) - 6*a^3*B^2*d^3*n^2*(L \\
& \text{og}[(a + b*x)/(c + d*x)]^2*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] + 2*\text{Log}[(a + b*x)/ \\
& (c + d*x)]*\text{PolyLog}[2, (d*(a + b*x))/(b*(c + d*x))] - 2*\text{PolyLog}[3, (d*(a + b \\
& *x))/(b*(c + d*x))] + B^2*n^2*(2*b^3*c^2*d*x - 4*a*b^2*c*d^2*x + 2*a^2*b*d \\
& ^3*x + 2*a^2*b*c*d^2*\text{Log}[a + b*x] - 2*a^3*d^3*\text{Log}[a + b*x] - 3*a^2*b*c*d^2* \\
& \text{Log}[a + b*x]^2 - 2*a^3*d^3*\text{Log}[a + b*x]^2 + 10*a*b^2*c^2*d*\text{Log}[(a + b*x)/(c \\
& + d*x)] - 6*a^2*b*c*d^2*\text{Log}[(a + b*x)/(c + d*x)] - 4*a^3*d^3*\text{Log}[(a + b*x) \\
& /(c + d*x)] + 10*b^3*c^2*d*x*\text{Log}[(a + b*x)/(c + d*x)] - 6*a*b^2*c*d^2*x*\text{Log} \\
& [(a + b*x)/(c + d*x)] - 4*a^2*b*d^3*x*\text{Log}[(a + b*x)/(c + d*x)] - 2*b^3*c*d^ \\
& 2*x^2*\text{Log}[(a + b*x)/(c + d*x)] + 2*a*b^2*d^3*x^2*\text{Log}[(a + b*x)/(c + d*x)] + \\
& 6*a^2*b*c*d^2*\text{Log}[a + b*x]*\text{Log}[(a + b*x)/(c + d*x)] + 4*a^3*d^3*\text{Log}[a + b* \\
& x]*\text{Log}[(a + b*x)/(c + d*x)] + 6*a*b^2*c^2*d*\text{Log}[(a + b*x)/(c + d*x)]^2 + 6* \\
& b^3*c^2*d*x*\text{Log}[(a + b*x)/(c + d*x)]^2 - 3*b^3*c*d^2*x^2*\text{Log}[(a + b*x)/(c + \\
& d*x)]^2 + 2*b^3*d^3*x^3*\text{Log}[(a + b*x)/(c + d*x)]^2 - 12*b^3*c^3*\text{Log}[c + d* \\
& x] + 18*a*b^2*c^2*d*\text{Log}[c + d*x] - 2*a^2*b*c*d^2*\text{Log}[c + d*x] - 4*a^3*d^3*L \\
& \text{og}[c + d*x] + 6*a^2*b*c*d^2*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)] + 4 \\
& *a^3*d^3*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)] - 22*b^3*c^3*\text{Log}[(d*(a \\
& + b*x))/(-(b*c) + a*d)]*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] + 12*a*b^2*c^2*d*L \\
& \text{og}[(d*(a + b*x))/(-(b*c) + a*d)]*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] + 22*b^3*c^3 \\
& *\text{Log}[(a + b*x)/(c + d*x)]*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] - 12*a*b^2*c^2*d*L \\
& \text{og}[(a + b*x)/(c + d*x)]*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] + 6*b^3*c^3*\text{Log}[(a + \\
& b*x)/(c + d*x)]^2*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] - 11*b^3*c^3*\text{Log}[(b*c - a \\
& *d)/(b*c + b*d*x)]^2 + 6*a*b^2*c^2*d*\text{Log}[(b*c - a*d)/(b*c + b*d*x)]^2 + 2*a \\
& ^2*d^2*(3*b*c + 2*a*d)*\text{PolyLog}[2, (d*(a + b*x))/(-(b*c) + a*d)] + 12*b^3*c^ \\
& 3*\text{Log}[(a + b*x)/(c + d*x)]*\text{PolyLog}[2, (d*(a + b*x))/(b*(c + d*x))] + 22*b^3 \\
& *c^3*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)] - 12*a*b^2*c^2*d*\text{PolyLog}[2, (b*( \\
& c + d*x))/(b*c - a*d)] - 12*b^3*c^3*\text{PolyLog}[3, (d*(a + b*x))/(b*(c + d*x))] \\
& )))/(6*d^4*i)
\end{aligned}$$

**Maple [F]** time = 0.676, size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^3}{dix + ci} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i),x)

[Out] int((b\*g\*x+a\*g)^3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i),x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i),x, algorithm="maxima")

[Out]  $3A^2a^2b^3g^3(x/(d^2i) - c \log(dx + c)/(d^2i)) - 1/6A^2b^3g^3(6c^3 \log(dx + c)/(d^4i) - (2d^2x^3 - 3cdx^2 + 6c^2x)/(d^3i)) + 3/2A^2ab^2g^3(2c^2 \log(dx + c)/(d^3i) + (dx^2 - 2cx)/(d^2i)) + A^2a^3g^3 \log(dix + ci)/(d^2i) + 1/6(2B^2b^3d^3g^3x^3 - 3(b^3cd^2g^3x^3 - 3ab^2d^3g^3)B^2x^2 + 6(b^3c^2d^2g^3 - 3ab^2cd^2g^3 + 3a^2bd^3g^3)B^2x - 6(b^3c^3g^3 - 3ab^2c^2d^2g^3 + 3a^2b^2cd^2g^3 - a^3d^3g^3)B^2 \log(dx + c)) \log((dx + c)^n)/(d^4i) - \text{integrate}(-1/3(3B^2a^3d^3g^3 \log(e)^2 + 6ABa^3d^3g^3 \log(e) + 3(B^2b^3d^3g^3 \log(e)^2 + 2ABb^3d^3g^3 \log(e)))x^3 + 9(B^2ab^2d^3g^3 \log(e)^2 + 2ABab^2d^3g^3 \log(e))x^2 + 3(B^2b^3d^3g^3x^3 + 3B^2ab^2d^3g^3x^2 + 3B^2a^2bd^3g^3x + B^2a^3d^3g^3) \log((bx + a)^n)^2 + 9(B^2a^2bd^3g^3 \log(e)^2 + 2ABa^2bd^3g^3 \log(e))x + 6(B^2a^3d^3g^3 \log(e) + ABa^3d^3g^3 + (B^2b^3d^3g^3 \log(e) + ABb^3d^3g^3)x^3 + 3(B^2ab^2d^3g^3 \log(e) + ABab^2d^3g^3)x^2 + 3(B^2a^2bd^3g^3 \log(e) + ABa^2bd^3g^3)x) \log((bx + a)^n) - (6B^2a^3d^3g^3 \log(e) + 6ABa^3d^3g^3 + 2(3ABb^3d^3g^3 + (g^3n + 3g^3 \log(e)))B^2b^3d^3) x^3 - 6(b^3c^3g^3n - 3ab^2c^2d^2g^3n + 3a^2b^2cd^2g^3n - a^3d^3g^3n)B^2 \log(dx + c) + 3(6ABab^2d^3g^3 - (b^3cd^2g^3n - 3(g^3n + 2g^3 \log(e))ab^2d^3)B^2)x^2 + 6(3ABa^2bd^3g^3 + (b^3c^2d^2g^3n - 3ab^2cd^2g^3n + 3(g^3n + g^3 \log(e)))a^2bd^3)B^2)x + 6(B^2b^3d^3g^3x^3 + 3B^2ab^2d^3g^3x^2 + 3B^2$

$2*a^2*b*d^3*g^3*x + B^2*a^3*d^3*g^3)*\log((b*x + a)^n)*\log((d*x + c)^n)/(d^4*i*x + c*d^3*i), x)$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{A^2 b^3 g^3 x^3 + 3 A^2 a b^2 g^3 x^2 + 3 A^2 a^2 b g^3 x + A^2 a^3 g^3 + (B^2 b^3 g^3 x^3 + 3 B^2 a b^2 g^3 x^2 + 3 B^2 a^2 b g^3 x + B^2 a^3 g^3) \log\left(e\left(\frac{b}{d}\right)\right)}{dix + ci} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i),x, algorithm="fricas")

[Out] integral((A^2\*b^3\*g^3\*x^3 + 3\*A^2\*a\*b^2\*g^3\*x^2 + 3\*A^2\*a^2\*b\*g^3\*x + A^2\*a^3\*g^3 + (B^2\*b^3\*g^3\*x^3 + 3\*B^2\*a\*b^2\*g^3\*x^2 + 3\*B^2\*a^2\*b\*g^3\*x + B^2\*a^3\*g^3)\*log(e\*((b\*x + a)/(d\*x + c))^n))^2 + 2\*(A\*B\*b^3\*g^3\*x^3 + 3\*A\*B\*a\*b^2\*g^3\*x^2 + 3\*A\*B\*a^2\*b\*g^3\*x + A\*B\*a^3\*g^3)\*log(e\*((b\*x + a)/(d\*x + c))^n))/(d\*i\*x + c\*i), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*\*3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c)\*\*n))\*\*2/(d\*i\*x+c\*i),x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^3 \left( B \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A \right)^2}{dix + ci} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(d*i*x + c*i), x)
```

$$3.187 \quad \int \frac{(ag+bgx)^2 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{ci+dix} dx$$

**Optimal.** Leaf size=573

$$\frac{2Bg^2n(bc-ad)^2 \text{PolyLog} \left( 2, \frac{d(a+bx)}{b(c+dx)} \right) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{d^3i} - \frac{4B^2g^2n^2(bc-ad)^2 \text{PolyLog} \left( 2, \frac{d(a+bx)}{b(c+dx)} \right)}{d^3i} - \frac{B^2g^2n^2(bc-ad)^2 \text{PolyLog} \left( 3, \frac{d(a+bx)}{b(c+dx)} \right)}{d^3i}$$

```
[Out] -((B*(b*c - a*d)*g^2*n*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(d^2*i) - (2*(b*c - a*d)*g^2*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(d^2*i) + (b^2*g^2*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*d^3*i) - (4*B*(b*c - a*d)^2*g^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(d^3*i) - ((b*c - a*d)^2*g^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[(b*c - a*d)/(b*(c + d*x))])/(d^3*i) + (B^2*(b*c - a*d)^2*g^2*n^2*Log[c + d*x])/(d^3*i) + (B*(b*c - a*d)^2*g^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(d^3*i) - (4*B^2*(b*c - a*d)^2*g^2*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i) - (2*B*(b*c - a*d)^2*g^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i) - (B^2*(b*c - a*d)^2*g^2*n^2*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(d^3*i) + (2*B^2*(b*c - a*d)^2*g^2*n^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i)
```

**Rubi [B]** time = 4.74552, antiderivative size = 1780, normalized size of antiderivative = 3.11, number of steps used = 82, number of rules used = 27, integrand size = 45,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.6$ , Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 2486, 31, 6688, 6742, 2499, 2396, 2433, 2374, 6589, 2302, 30, 2500, 2375, 2317, 2440, 2434}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i + d*i*x), x]
```

```
[Out] -((A*b*B*(b*c - a*d)*g^2*n*x)/(d^2*i) + (a*B^2*(b*c - a*d)*g^2*n^2*Log[a + b*x]^2)/(d^2*i) - (B^2*(b*c - a*d)*g^2*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(d^2*i) - (2*a*B*(b*c - a*d)*g^2*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(d^2*i) - (b*(b*c - a*d)*g^2*x*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(d^2*i) + (g^2*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*d*i) + (B^2*(b*c - a*d)^2*g^2*n^2*Log[c + d*x])/(d^3*i) -
```



$$\begin{aligned}
& (2*b*B^2*c*(b*c - a*d)*g^2*n^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/(d^3*i) - (B^2*(b*c - a*d)^2*g^2*n^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]* \\
& \text{Log}[c + d*x])/(d^3*i) + (2*b*B*c*(b*c - a*d)*g^2*n*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])* \\
& \text{Log}[c + d*x])/(d^3*i) + (B*(b*c - a*d)^2*g^2*n*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])* \\
& \text{Log}[c + d*x])/(d^3*i) + (b*B^2*c*(b*c - a*d)*g^2*n^2*\text{Log}[c + d*x]^2)/(d^3*i) + (B^2*(b*c - a*d)^2*g^2*n^2*\text{Log}[c + d*x]^2)/(2 \\
& *d^3*i) - (2*a*B^2*(b*c - a*d)*g^2*n^2*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)])/(d^2*i) + (B^2*(b*c - a*d)^2*g^2*\text{Log}[(a + b*x)^n]^2*\text{Log}[(b*(c + d*x))/(b*c - a*d)])/(d^3*i) - (B^2*(b*c - a*d)^2*g^2*\text{Log}[(a + b*x)^n]^2*\text{Log}[i*(c + d*x)])/(d^3*i) + (A*B*(b*c - a*d)^2*g^2*n*\text{Log}[i*(c + d*x)]^2)/(d^3*i) - (B^2*(b*c - a*d)^2*g^2*n^2*\text{Log}[a + b*x]*\text{Log}[i*(c + d*x)]^2)/(d^3*i) + (B^2*(b*c - a*d)^2*g^2*n^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[i*(c + d*x)]^2)/(d^3*i) + (B^2*(b*c - a*d)^2*g^2*n^2*\text{Log}[i*(c + d*x)]^3)/(3*d^3*i) - (2*B^2*(b*c - a*d)^2*g^2*n*\text{Log}[a + b*x]*\text{Log}[i*(c + d*x)]*\text{Log}[(c + d*x)^(-n)])/(d^3*i) - (B^2*(b*c - a*d)^2*g^2*\text{Log}[a + b*x]*\text{Log}[(c + d*x)^(-n)]^2)/(d^3*i) + (B^2*(b*c - a*d)^2*g^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[(c + d*x)^(-n)]^2)/(d^3*i) - (2*A*B*(b*c - a*d)^2*g^2*n*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c*i + d*i*x])/(d^3*i) + ((b*c - a*d)^2*g^2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2*\text{Log}[c*i + d*i*x])/(d^3*i) + (2*B^2*(b*c - a*d)^2*g^2*n*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*(\text{Log}[(a + b*x)^n] - \text{Log}[e*((a + b*x)/(c + d*x))^n] + \text{Log}[(c + d*x)^(-n)])*\text{Log}[c*i + d*i*x])/(d^3*i) - (B^2*(b*c - a*d)^2*g^2*n^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c*i + d*i*x]^2)/(d^3*i) + (B^2*(b*c - a*d)^2*g^2*n*\text{Log}[e*((a + b*x)/(c + d*x))^n]*\text{Log}[c*i + d*i*x]^2)/(d^3*i) - (2*a*B^2*(b*c - a*d)*g^2*n^2*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))])/(d^2*i) + (2*B^2*(b*c - a*d)^2*g^2*n*\text{Log}[(a + b*x)^n]*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))])/(d^3*i) - (2*A*B*(b*c - a*d)^2*g^2*n*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])/(d^3*i) - (2*b*B^2*c*(b*c - a*d)*g^2*n^2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])/(d^3*i) - (B^2*(b*c - a*d)^2*g^2*n^2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])/(d^3*i) - (2*B^2*(b*c - a*d)^2*g^2*n*\text{Log}[(c + d*x)^(-n)]*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])/(d^3*i) + (2*B^2*(b*c - a*d)^2*g^2*n*(\text{Log}[(a + b*x)^n] - \text{Log}[e*((a + b*x)/(c + d*x))^n] + \text{Log}[(c + d*x)^(-n)])*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])/(d^3*i) - (2*B^2*(b*c - a*d)^2*g^2*n^2*\text{PolyLog}[3, -((d*(a + b*x))/(b*c - a*d))])/(d^3*i) - (2*B^2*(b*c - a*d)^2*g^2*n^2*\text{PolyLog}[3, (b*(c + d*x))/(b*c - a*d)])/(d^3*i)
\end{aligned}$$

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x] }, Int[u, x] /; SumQ[u]
] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

```

### Rule 2523

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] := Simp[x*(a +

```

$b \cdot \text{Log}[c \cdot \text{RFx}^p]^n, x] - \text{Dist}[b \cdot n \cdot p, \text{Int}[\text{SimplifyIntegrand}[(x \cdot (a + b \cdot \text{Log}[c \cdot \text{RFx}^p])^{n-1} \cdot D[\text{RFx}, x]) / \text{RFx}, x], x] /; \text{FreeQ}\{a, b, c, p\}, x] \&\& \text{RationalFunctionQ}[\text{RFx}, x] \&\& \text{IGtQ}[n, 0]$

### Rule 12

$\text{Int}[(a \cdot u), x\_Symbol] := \text{Dist}[a, \text{Int}[u, x], x] /; \text{FreeQ}[a, x] \&\& \text{!MatchQ}[u, (b \cdot v) /; \text{FreeQ}[b, x]]$

### Rule 2524

$\text{Int}[(a + \text{Log}[c \cdot (\text{RFx})^p] \cdot (b))^{n-1} / ((d + e \cdot x)), x\_Symbol] := \text{Simp}[(\text{Log}[d + e \cdot x] \cdot (a + b \cdot \text{Log}[c \cdot \text{RFx}^p])^n) / e, x] - \text{Dist}[(b \cdot n \cdot p) / e, \text{Int}[(\text{Log}[d + e \cdot x] \cdot (a + b \cdot \text{Log}[c \cdot \text{RFx}^p])^{n-1} \cdot D[\text{RFx}, x]) / \text{RFx}, x], x] /; \text{FreeQ}\{a, b, c, d, e, p\}, x] \&\& \text{RationalFunctionQ}[\text{RFx}, x] \&\& \text{IGtQ}[n, 0]$

### Rule 2418

$\text{Int}[(a + \text{Log}[c \cdot (d + e \cdot x)^n] \cdot (b))^{p-1} \cdot (\text{RFx}), x\_Symbol] := \text{With}\{u = \text{ExpandIntegrand}[(a + b \cdot \text{Log}[c \cdot (d + e \cdot x)^n])^p, \text{RFx}, x]\}, \text{Int}[u, x] /; \text{SumQ}[u] /; \text{FreeQ}\{a, b, c, d, e, n\}, x] \&\& \text{RationalFunctionQ}[\text{RFx}, x] \&\& \text{IntegerQ}[p]$

### Rule 2390

$\text{Int}[(a + \text{Log}[c \cdot (d + e \cdot x)^n] \cdot (b))^{p-1} \cdot ((f + g \cdot x)^q), x\_Symbol] := \text{Dist}[1/e, \text{Subst}[\text{Int}[(f \cdot x)/d]^q \cdot (a + b \cdot \text{Log}[c \cdot x^n])^p, x], x, d + e \cdot x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, n, p, q\}, x] \&\& \text{EqQ}[e \cdot f - d \cdot g, 0]$

### Rule 2301

$\text{Int}[(a + \text{Log}[c \cdot x^n] \cdot (b)) / (x), x\_Symbol] := \text{Simp}[(a + b \cdot \text{Log}[c \cdot x^n])^2 / (2 \cdot b \cdot n), x] /; \text{FreeQ}\{a, b, c, n\}, x]$

### Rule 2394

$\text{Int}[(a + \text{Log}[c \cdot (d + e \cdot x)^n] \cdot (b)) / ((f + g \cdot x)), x\_Symbol] := \text{Simp}[(\text{Log}[(e \cdot (f + g \cdot x)) / (e \cdot f - d \cdot g)] \cdot (a + b \cdot \text{Log}[c \cdot (d + e \cdot x)^n]) / g, x] - \text{Dist}[(b \cdot e \cdot n) / g, \text{Int}[\text{Log}[(e \cdot (f + g \cdot x)) / (e \cdot f - d \cdot g)] / (d + e \cdot x), x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, n\}, x] \&\& \text{NeQ}[e \cdot f - d \cdot g, 0]$

### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))])*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_)^(m_.
)), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

### Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_)^(p_.))*((c_.) + (d_.)*(x_)^(q_.))
^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q]^r]^s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

### Rule 31

```
Int[((a_) + (b_.)*(x_)^(-1)), x_Symbol] := Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

### Rule 6688

```
Int[u_, x_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

### Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

### Rule 2499

```

Int[(Log[(e_.)*((f_.)*(a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^^(r_.)]*((s_.) + Log[(i_.)*(g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] := Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q]^r)/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]

```

### Rule 2396

```

Int[((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.))/((f_.) + (g_.
)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]

```

### Rule 2433

```

Int[((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] := Dist[1/e, Subst[Int[(k*x)/d]^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
e*i - d*j)/e + (j*x)/e]^m), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]

```

### Rule 2374

```

Int[(Log[(d_.)*((e_.) + (f_.)*(x_))^(m_.))]*((a_.) + Log[(c_.)*(x_))^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] := -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]

```

### Rule 6589

```

Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]

```

### Rule 2302

```

Int[((a_.) + Log[(c_.)*(x_))^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] := Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
x]

```

Rule 30

Int[(x\_)^(m\_), x\_Symbol] := Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && NeQ[m, -1]

Rule 2500

Int[(Log[(e\_)\*((f\_)\*(a\_) + (b\_)\*(x\_))^(p\_)\*((c\_) + (d\_)\*(x\_))^(q\_)]^(r\_))\*((s\_) + Log[(i\_)\*((g\_) + (h\_)\*(x\_))^(n\_)]\*(t\_)))/((j\_) + (k\_)\*(x\_)), x\_Symbol] := Dist[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q)^r] - Log[(a + b\*x)^(p\*r)] - Log[(c + d\*x)^(q\*r)], Int[(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x], x] + (Int[(Log[(a + b\*x)^(p\*r)]\*(s + t\*Log[i\*(g + h\*x)^n]))/(j + k\*x), x] + Int[(Log[(c + d\*x)^(q\*r)]\*(s + t\*Log[i\*(g + h\*x)^n]))/(j + k\*x), x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0]

Rule 2375

Int[(Log[(d\_)\*((e\_) + (f\_)\*(x\_)^(m\_))^(r\_)]\*(a\_) + Log[(c\_)\*(x\_)^(n\_)])\*(b\_)^(p\_))/(x\_), x\_Symbol] := Simp[(Log[d\*(e + f\*x^m)^r]\*(a + b\*Log[c\*x^n])^(p + 1))/(b\*n\*(p + 1)), x] - Dist[(f\*m\*r)/(b\*n\*(p + 1)), Int[(x^(m - 1)\*(a + b\*Log[c\*x^n])^(p + 1))/(e + f\*x^m), x], x] /; FreeQ[{a, b, c, d, e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d\*e, 1]

Rule 2317

Int[((a\_) + Log[(c\_)\*(x\_)^(n\_)])\*(b\_)^(p\_)/((d\_) + (e\_)\*(x\_)), x\_Symbol] := Simp[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^p)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

Rule 2440

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_))^(n\_)]\*(b\_))\*((f\_) + Log[(h\_)\*((i\_) + (j\_)\*(x\_))^(m\_)]\*(g\_))\*((k\_) + (l\_)\*(x\_))^(r\_), x\_Symbol] := Dist[1/l, Subst[Int[x^r\*(a + b\*Log[c\*(-((e\*k - d\*1)/1) + (e\*x)/1)^n])\*(f + g\*Log[h\*(-((j\*k - i\*1)/1) + (j\*x)/1)^m]), x], x, k + l\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]

Rule 2434

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_))^(n\_)]\*(b\_))\*((f\_) + Log[(h\_)\*((i\_) + (j\_)\*(x\_))^(m\_)]\*(g\_)))/((k\_) + (l\_)\*(x\_)), x\_Symbol] := Simp[Log[x]\*(a + b\*Log[c\*(d + e\*x)^n])\*(f + g\*Log[h\*(i + j\*x)^m]), x] + (-Dist[e\*g\*m, Int[(Log[x]\*(a + b\*Log[c\*(d + e\*x)^n])]/(d + e\*x), x], x] - Dist[b\*j\*n, Int[(Log[x

`]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]`

Rubi steps

$$\begin{aligned}
\int \frac{(ag + bgx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{187c + 187dx} dx &= \int \left[ -\frac{b(bc - ad)g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{187d^2} + \frac{(bc - ad)^2 g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{d^2(187c + 187dx)} \right] dx \\
&= \frac{(bg) \int (ag + bgx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx}{187d} - \frac{(b(bc - ad)g^2) \int \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx}{187d} \\
&= -\frac{b(bc - ad)g^2 x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{187d^2} + \frac{g^2(a + bx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{374d} \\
&= -\frac{b(bc - ad)g^2 x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{187d^2} + \frac{g^2(a + bx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{374d} \\
&= -\frac{b(bc - ad)g^2 x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{187d^2} + \frac{g^2(a + bx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{374d} \\
&= -\frac{b(bc - ad)g^2 x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{187d^2} + \frac{g^2(a + bx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{374d} \\
&= -\frac{AbB(bc - ad)g^2 nx}{187d^2} - \frac{2aB(bc - ad)g^2 n \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{187d^2} \\
&= -\frac{AbB(bc - ad)g^2 nx}{187d^2} - \frac{B^2(bc - ad)g^2 n(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{187d^2} - \frac{2aB(bc - ad)g^2 n \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{187d^2} \\
&= -\frac{AbB(bc - ad)g^2 nx}{187d^2} - \frac{B^2(bc - ad)g^2 n(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{187d^2} - \frac{2aB(bc - ad)g^2 n \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{187d^2} \\
&= -\frac{AbB(bc - ad)g^2 nx}{187d^2} - \frac{B^2(bc - ad)g^2 n(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{187d^2} - \frac{2aB(bc - ad)g^2 n \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{187d^2} \\
&= -\frac{AbB(bc - ad)g^2 nx}{187d^2} + \frac{aB^2(bc - ad)g^2 n^2 \log^2(a + bx)}{187d^2} - \frac{B^2(bc - ad)g^2 n(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{187d^2} \\
&= -\frac{AbB(bc - ad)g^2 nx}{187d^2} + \frac{aB^2(bc - ad)g^2 n^2 \log^2(a + bx)}{187d^2} - \frac{B^2(bc - ad)g^2 n(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{187d^2}
\end{aligned}$$

**Mathematica [B]** time = 1.59149, size = 1741, normalized size = 3.04

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i + d*i*x), x]
```

```
[Out] (g^2*(-2*b*d*(b*c - 2*a*d)*x*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2 + b^2*d^2*x^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2 + 2*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2*Log[c + d*x] + 2*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(-2*b^2*c^2 + 2*a*b*c*d - b^2*c*d*x + a*b*d^2*x + 2*b^2*c^2*Log[c/d + x] - b^2*c^2*Log[c/d + x]^2 - a^2*d^2*Log[a + b*x] - 2*b^2*c*d*x*Log[(a + b*x)/(c + d*x)] + b^2*d^2*x^2*Log[(a + b*x)/(c + d*x)] + b^2*c^2*Log[c + d*x] + 2*b^2*c^2*Log[c/d + x]*Log[c + d*x] + 2*b^2*c^2*Log[(a + b*x)/(c + d*x)]*Log[c + d*x] - 2*b*c*Log[a/b + x]*(a*d + b*c*Log[c + d*x] - b*c*Log[(b*(c + d*x))/(b*c - a*d)]) + 2*b^2*c^2*PolyLog[2, (d*(a + b*x))/(-b*c + a*d)] - 2*a^2*B*d^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(Log[c/d + x]^2 + 2*(Log[a/b + x] - Log[c/d + x] - Log[(a + b*x)/(c + d*x)])*Log[c + d*x] - 2*(Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] + PolyLog[2, (d*(a + b*x))/(-b*c + a*d)]) - 4*a*B*d*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])*(-2*d*(a + b*x)*(-1 + Log[a/b + x]) + 2*b*(c + d*x)*(-1 + Log[c/d + x]) - b*c*Log[c/d + x]^2 + 2*b*(Log[a/b + x] - Log[c/d + x] - Log[(a + b*x)/(c + d*x)])*(d*x - c*Log[c + d*x]) + 2*b*c*(Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)] + PolyLog[2, (d*(a + b*x))/(-b*c + a*d)]) + 4*a*B^2*d*n^2*(d*(a + b*x)*Log[(a + b*x)/(c + d*x)]^2 + b*c*Log[(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] - (b*c - a*d)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-b*c + a*d)] - 2*Log[(a + b*x)/(c + d*x)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] + 2*b*c*(Log[(a + b*x)/(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - PolyLog[3, (d*(a + b*x))/(b*(c + d*x))]) + B^2*n^2*(2*d*(-b*c + a*d)*(a + b*x)*Log[(a + b*x)/(c + d*x)] - 2*a^2*d^2*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] + b^2*d^2*x^2*Log[(a + b*x)/(c + d*x)]^2 - 2*b*c*d*(a + b*x)*Log[(a + b*x)/(c + d*x)]^2 + 2*(b*c - a*d)^2*Log[c + d*x] - 2*b^2*c^2*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] - 2*b^2*c^2*Log[(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] + a^2*d^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-b*c + a*d)] + b^2*c^2*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-b*c + a*d)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] + 2*b*c*(b*c - a*d)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-b*c + a*d)] - 2*Log[(a + b*x)
```



/(c + d\*x)] + Log[(b\*c - a\*d)/(b\*c + b\*d\*x))] - 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)] - 4\*b^2\*c^2\*(Log[(a + b\*x)/(c + d\*x)]\*PolyLog[2, (d\*(a + b\*x))/(b\*(c + d\*x))] - PolyLog[3, (d\*(a + b\*x))/(b\*(c + d\*x))]) - 2\*a^2\*B^2\*d^2\*n^2\*(Log[(a + b\*x)/(c + d\*x)]^2\*Log[(b\*c - a\*d)/(b\*c + b\*d\*x)] + 2\*Log[(a + b\*x)/(c + d\*x)]\*PolyLog[2, (d\*(a + b\*x))/(b\*(c + d\*x))] - 2\*PolyLog[3, (d\*(a + b\*x))/(b\*(c + d\*x))])/(2\*d^3\*i)

**Maple [F]** time = 0.694, size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^2}{dix + ci} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i),x)

[Out] int((b\*g\*x+a\*g)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i),x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i),x, algorithm="maxima")

[Out] 2\*A^2\*a\*b\*g^2\*(x/(d\*i) - c\*log(d\*x + c)/(d^2\*i)) + 1/2\*A^2\*b^2\*g^2\*(2\*c^2\*log(d\*x + c)/(d^3\*i) + (d\*x^2 - 2\*c\*x)/(d^2\*i)) + A^2\*a^2\*g^2\*log(d\*i\*x + c\*i)/(d\*i) + 1/2\*(B^2\*b^2\*d^2\*g^2\*x^2 - 2\*(b^2\*c\*d\*g^2 - 2\*a\*b\*d^2\*g^2)\*B^2\*x + 2\*(b^2\*c^2\*g^2 - 2\*a\*b\*c\*d\*g^2 + a^2\*d^2\*g^2)\*B^2\*log(d\*x + c))\*log((d\*x + c)^n)^2/(d^3\*i) - integrate(-(B^2\*a^2\*d^2\*g^2\*log(e)^2 + 2\*A\*B\*a^2\*d^2\*g^2\*log(e) + (B^2\*b^2\*d^2\*g^2\*log(e)^2 + 2\*A\*B\*b^2\*d^2\*g^2\*log(e))\*x^2 + (B^2\*b^2\*d^2\*g^2\*x^2 + 2\*B^2\*a\*b\*d^2\*g^2\*x + B^2\*a^2\*d^2\*g^2)\*log((b\*x + a)^n)^2 + 2\*(B^2\*a\*b\*d^2\*g^2\*log(e)^2 + 2\*A\*B\*a\*b\*d^2\*g^2\*log(e))\*x + 2\*(B^2\*a^2\*d^2\*g^2\*log(e) + A\*B\*a^2\*d^2\*g^2 + (B^2\*b^2\*d^2\*g^2\*log(e) + A\*B\*b^2\*d^2\*g^2)\*x^2 + 2\*(B^2\*a\*b\*d^2\*g^2\*log(e) + A\*B\*a\*b\*d^2\*g^2)\*x)\*log((b\*x + a)^n) - (2\*B^2\*a^2\*d^2\*g^2\*log(e) + 2\*A\*B\*a^2\*d^2\*g^2 + 2\*(b^2\*c^2\*g^2\*n - 2\*a\*b\*c\*d\*g^2\*n + a^2\*d^2\*g^2\*n)\*B^2\*log(d\*x + c) + (2\*A\*B\*b^2\*d^2\*g^2 + (g^2\*n +

$$2*g^2*\log(e))*B^2*b^2*d^2)*x^2 + 2*(2*A*B*a*b*d^2*g^2 - (b^2*c*d*g^2*n - 2*(g^2*n + g^2*\log(e))*a*b*d^2)*B^2)*x + 2*(B^2*b^2*d^2*g^2*x^2 + 2*B^2*a*b*d^2*g^2*x + B^2*a^2*d^2*g^2)*\log((b*x + a)^n)*\log((d*x + c)^n)/(d^3*i*x + c*d^2*i), x)$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{A^2 b^2 g^2 x^2 + 2 A^2 a b g^2 x + A^2 a^2 g^2 + (B^2 b^2 g^2 x^2 + 2 B^2 a b g^2 x + B^2 a^2 g^2) \log \left( e \left( \frac{b x + a}{d x + c} \right)^n \right)^2 + 2 (A B b^2 g^2 x^2 + 2 A B a b g^2 x + A^2 a^2 g^2) \log \left( e \left( \frac{b x + a}{d x + c} \right)^n \right)}{d i x + c i}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i),x, algorithm="fricas")

[Out] integral((A^2\*b^2\*g^2\*x^2 + 2\*A^2\*a\*b\*g^2\*x + A^2\*a^2\*g^2 + (B^2\*b^2\*g^2\*x^2 + 2\*B^2\*a\*b\*g^2\*x + B^2\*a^2\*g^2)\*log(e\*((b\*x + a)/(d\*x + c))^n))^2 + 2\*(A\*B\*b^2\*g^2\*x^2 + 2\*A\*B\*a\*b\*g^2\*x + A\*B\*a^2\*g^2)\*log(e\*((b\*x + a)/(d\*x + c))^n))/(d\*i\*x + c\*i), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*\*2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n))\*\*2/(d\*i\*x+c\*i),x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(b g x + a g)^2 \left( B \log \left( e \left( \frac{b x + a}{d x + c} \right)^n \right) + A \right)^2}{d i x + c i} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(d*i*x + c*i), x)
```

$$3.188 \quad \int \frac{(ag+bgx) \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{ci+dx} dx$$

**Optimal.** Leaf size=303

$$\frac{2Bgn(bc-ad)\text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{d^2i} + \frac{2B^2gn^2(bc-ad)\text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)}{d^2i} - \frac{2B^2gn^2(bc-ad)\text{PolyLog}\left(3, \frac{d(a+bx)}{b(c+dx)}\right)}{d^2i}$$

[Out] (g\*(a + b\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(d\*i) + (2\*B\*(b\*c - a\*d)\*g\*n\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[(b\*c - a\*d)/(b\*(c + d\*x))])/(d^2\*i) + ((b\*c - a\*d)\*g\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2\*Log[(b\*c - a\*d)/(b\*(c + d\*x))])/(d^2\*i) + (2\*B^2\*(b\*c - a\*d)\*g\*n^2\*PolyLog[2, (d\*(a + b\*x))/(b\*(c + d\*x))])/(d^2\*i) + (2\*B\*(b\*c - a\*d)\*g\*n\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*PolyLog[2, (d\*(a + b\*x))/(b\*(c + d\*x))])/(d^2\*i) - (2\*B^2\*(b\*c - a\*d)\*g\*n^2\*PolyLog[3, (d\*(a + b\*x))/(b\*(c + d\*x))])/(d^2\*i)

**Rubi [B]** time = 4.03193, antiderivative size = 1156, normalized size of antiderivative = 3.82, number of steps used = 65, number of rules used = 24, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.558$ , Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2500, 2433, 2375, 2317, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

$$\frac{B^2(bc-ad)gn^2 \log^3(c+dx)}{3d^2i} - \frac{bB^2cgn^2 \log^2(c+dx)}{d^2i} - \frac{AB(bc-ad)gn \log^2(c+dx)}{d^2i} + \frac{B^2(bc-ad)gn^2 \log(a+bx) \log^2(c+dx)}{d^2i}$$

Antiderivative was successfully verified.

[In] Int[((a\*g + b\*g\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(c\*i + d\*i\*x), x]

[Out] -((a\*B^2\*g\*n^2\*Log[a + b\*x]^2)/(d\*i)) + (2\*a\*B\*g\*n\*Log[a + b\*x]\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])/(d\*i) + (b\*g\*x\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(d\*i) + (2\*A\*B\*(b\*c - a\*d)\*g\*n\*Log[-((d\*(a + b\*x))/(b\*c - a\*d))]\*Log[c + d\*x])/(d^2\*i) + (2\*b\*B^2\*c\*g\*n^2\*Log[-((d\*(a + b\*x))/(b\*c - a\*d))]\*Log[c + d\*x])/(d^2\*i) + (B^2\*(b\*c - a\*d)\*g\*Log[(a + b\*x)^n]^2\*Log[c + d\*x])/(d^2\*i) - (2\*b\*B\*c\*g\*n\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[c + d\*x])/(d^2\*i) - ((b\*c - a\*d)\*g\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2\*Log[c + d\*x])/(d^2\*i) - (A\*B\*(b\*c - a\*d)\*g\*n\*Log[c + d\*x]^2)/(d^2\*i) - (b\*B^2\*c\*g\*n^2\*Log[c + d\*x]^2)/(d^2\*i) + (B^2\*(b\*c - a\*d)\*g\*n^2\*Log[a + b\*x]\*Log[c + d\*x]^2)/(d^2\*i) - (B^2\*(b\*c - a\*d)\*g\*n\*Log[e\*((a + b\*x)/(c + d\*x))^n]\*Log[c

$$\begin{aligned}
& + d*x]^2)/(d^2*i) - (B^2*(b*c - a*d)*g*n^2*Log[c + d*x]^3)/(3*d^2*i) + (2* \\
& a*B^2*g*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)]/(d*i) - (B^2*(b*c \\
& - a*d)*g*Log[(a + b*x)^n]^2*Log[(b*(c + d*x))/(b*c - a*d)]/(d^2*i) + (2*B^ \\
& 2*(b*c - a*d)*g*n*Log[a + b*x]*Log[c + d*x]*Log[(c + d*x)^(-n)]/(d^2*i) + \\
& (B^2*(b*c - a*d)*g*Log[a + b*x]*Log[(c + d*x)^(-n)]^2)/(d^2*i) - (B^2*(b*c \\
& - a*d)*g*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^(-n)]^2)/(d^2*i) - \\
& (2*B^2*(b*c - a*d)*g*n*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x]*(Log \\
& [(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)]))/(d^2 \\
& *i) + (2*a*B^2*g*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))]/(d*i) - (2*B \\
& ^2*(b*c - a*d)*g*n*Log[(a + b*x)^n]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d)) \\
& ])/(d^2*i) + (2*A*B*(b*c - a*d)*g*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]/ \\
& (d^2*i) + (2*b*B^2*c*g*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]/(d^2*i) + \\
& (2*B^2*(b*c - a*d)*g*n*Log[(c + d*x)^(-n)]*PolyLog[2, (b*(c + d*x))/(b*c - \\
& a*d)]/(d^2*i) - (2*B^2*(b*c - a*d)*g*n*(Log[(a + b*x)^n] - Log[e*((a + b* \\
& x)/(c + d*x))^n] + Log[(c + d*x)^(-n)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d \\
& )]/(d^2*i) + (2*B^2*(b*c - a*d)*g*n^2*PolyLog[3, -((d*(a + b*x))/(b*c - a* \\
& d))]/(d^2*i) + (2*B^2*(b*c - a*d)*g*n^2*PolyLog[3, (b*(c + d*x))/(b*c - a* \\
& d)]/(d^2*i)
\end{aligned}$$

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]

```

### Rule 2523

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] := Simp[x*(a +
b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]

```

### Rule 12

```

Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]

```

### Rule 2524

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol]
:= With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n]]^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)
*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)
^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

### Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] := Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

### Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_.) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] := Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
e*i - d*j)/e + (j*x)/e]^m)], x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*1, 0]
```

### Rule 2375

```
Int[(Log[(d_.)*((e_.) + (f_.)*(x_))^(m_.))]^(r_.)]*((a_.) + Log[(c_.)*(x_))^(n
_.)]*(b_.))^(p_.))/(x_), x_Symbol] := Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

### Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_))^(n_.)]*(b_.))^(p_.)/((d_.) + (e_.)*(x_)), x_Symb
ol] := Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

### Rule 2374

```
Int[(Log[(d_.)*((e_.) + (f_.)*(x_))^(m_.))]^(r_.)]*((a_.) + Log[(c_.)*(x_))^(n
_.)]*(b_.))^(p_.))/(x_), x_Symbol] := -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_Symbol]
:> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d, e, n, p}, x]
&& EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol]
:> Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*1)/l) + (e*x)/l)^n])*(f +
g*Log[h*(-((j*k - i*1)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, m, n}, x]
&& IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol]
:> Simp[Log[x]*(a + b*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Log[x]
*(a + b*Log[c*(d + e*x)^n])]/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x]
*(f + g*Log[h*(i + j*x)^m])]/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, m, n}, x]
&& EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.)
+ (k_.)*(x_)), x_Symbol]
:> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r)/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dist[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x]
&& NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.)
*(x_)), x_Symbol]
:> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p}, x]
&& NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)]^(n_.)]*(b_.))^(p_)/(x_), x_Symbol]
:> Dist[1/(
```



$b \cdot n$ ), Subst[Int[x<sup>p</sup>, x], x, a + b\*Log[c\*x<sup>n</sup>], x] /; FreeQ[{a, b, c, n, p}, x]

### Rule 30

Int[(x\_)^(m\_.), x\_Symbol] := Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && NeQ[m, -1]

### Rubi steps

$$\begin{aligned}
\int \frac{(ag + bgx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{188c + 188dx} dx &= \int \left( \frac{bg \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{188d} + \frac{(-bc + ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{188d(c + dx)} \right) dx \\
&= \frac{(bg) \int \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx}{188d} - \frac{((bc - ad)g) \int \frac{\left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx}{c+dx}}{188d} \\
&= \frac{bgx \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{188d} - \frac{(bc - ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 \log(c + dx)}{188d^2} \\
&= \frac{bgx \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{188d} - \frac{(bc - ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 \log(c + dx)}{188d^2} \\
&= \frac{bgx \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{188d} - \frac{(bc - ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 \log(c + dx)}{188d^2} \\
&= \frac{bgx \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{188d} - \frac{(bc - ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 \log(c + dx)}{188d^2} \\
&= \frac{aBgn \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{94d} + \frac{bgx \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{188d} \\
&= \frac{aBgn \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{94d} + \frac{bgx \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{188d} \\
&= \frac{aBgn \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{94d} + \frac{bgx \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{188d} \\
&= -\frac{aB^2gn^2 \log^2(a + bx)}{188d} + \frac{aBgn \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{94d} + \frac{bgx \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{188d} \\
&= -\frac{aB^2gn^2 \log^2(a + bx)}{188d} + \frac{aBgn \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{94d} + \frac{bgx \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{188d}
\end{aligned}$$

**Mathematica [B]** time = 0.667736, size = 802, normalized size = 2.65

$$g \left( -B^2 \left( d(a+bx) \log^2 \left( \frac{a+bx}{c+dx} \right) + bc \log \left( \frac{bc-ad}{bc+bdx} \right) \log^2 \left( \frac{a+bx}{c+dx} \right) - (bc-ad) \left( \log \left( \frac{bc-ad}{bc+bdx} \right) \left( 2 \log \left( \frac{d(a+bx)}{ad-bc} \right) - 2 \log \left( \frac{a+bx}{c+dx} \right) + \log \left( \frac{bc-ad}{bc+bdx} \right) \right) \right) \right)$$

Antiderivative was successfully verified.

[In] Integrate[((a\*g + b\*g\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(c\*i + d\*i\*x),x]

[Out] -((g\*(-(b\*d\*x\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n] - B\*n\*Log[(a + b\*x)/(c + d\*x)])^2) + (b\*c - a\*d)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n] - B\*n\*Log[(a + b\*x)/(c + d\*x)])^2\*Log[c + d\*x] + a\*B\*d\*n\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n] - B\*n\*Log[(a + b\*x)/(c + d\*x)])\*(Log[c/d + x]^2 + 2\*(Log[a/b + x] - Log[c/d + x] - Log[(a + b\*x)/(c + d\*x)])\*Log[c + d\*x] - 2\*(Log[a/b + x]\*Log[(b\*(c + d\*x))/(b\*c - a\*d)] + PolyLog[2, (d\*(a + b\*x))/(-(b\*c) + a\*d)])) + B\*n\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n] - B\*n\*Log[(a + b\*x)/(c + d\*x)])\*(-2\*d\*(a + b\*x)\*(-1 + Log[a/b + x]) + 2\*b\*(c + d\*x)\*(-1 + Log[c/d + x]) - b\*c\*Log[c/d + x]^2 + 2\*b\*(Log[a/b + x] - Log[c/d + x] - Log[(a + b\*x)/(c + d\*x)])\*(d\*x - c\*Log[c + d\*x]) + 2\*b\*c\*(Log[a/b + x]\*Log[(b\*(c + d\*x))/(b\*c - a\*d)] + PolyLog[2, (d\*(a + b\*x))/(-(b\*c) + a\*d)])) - B^2\*n^2\*(d\*(a + b\*x)\*Log[(a + b\*x)/(c + d\*x)]^2 + b\*c\*Log[(a + b\*x)/(c + d\*x)]^2\*Log[(b\*c - a\*d)/(b\*c + b\*d\*x]) - (b\*c - a\*d)\*(Log[(b\*c - a\*d)/(b\*c + b\*d\*x)]\*(2\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)] - 2\*Log[(a + b\*x)/(c + d\*x)] + Log[(b\*c - a\*d)/(b\*c + b\*d\*x])) - 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)] + 2\*b\*c\*(Log[(a + b\*x)/(c + d\*x)]\*PolyLog[2, (d\*(a + b\*x))/(b\*(c + d\*x))] - PolyLog[3, (d\*(a + b\*x))/(b\*(c + d\*x))]) + a\*B^2\*d\*n^2\*(Log[(a + b\*x)/(c + d\*x)]^2\*Log[(b\*c - a\*d)/(b\*c + b\*d\*x]) + 2\*Log[(a + b\*x)/(c + d\*x)]\*PolyLog[2, (d\*(a + b\*x))/(b\*(c + d\*x))] - 2\*PolyLog[3, (d\*(a + b\*x))/(b\*(c + d\*x))]))/(d^2\*i)

**Maple [F]** time = 0.52, size = 0, normalized size = 0.

$$\int \frac{bgx + ag}{dix + ci} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i),x)

[Out] int((b\*g\*x+a\*g)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i),x)

---

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$A^2bg\left(\frac{x}{di} - \frac{c \log(dx+c)}{d^2i}\right) + \frac{A^2ag \log(dix+ci)}{di} + \frac{(B^2bdgx - (bcg - adg)B^2 \log(dx+c)) \log((dx+c)^n)^2}{d^2i} - \int -\frac{B^2adg}{d^2i}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i),x, algorithm="maxima")

[Out]  $A^2*b*g*(x/(d*i) - c*\log(d*x + c)/(d^2*i)) + A^2*a*g*\log(d*i*x + c*i)/(d*i) + (B^2*b*d*g*x - (b*c*g - a*d*g)*B^2*\log(d*x + c))*\log((d*x + c)^n)^2/(d^2*i) - \text{integrate}(- (B^2*a*d*g*\log(e)^2 + 2*A*B*a*d*g*\log(e) + (B^2*b*d*g*x + B^2*a*d*g)*\log((b*x + a)^n)^2 + (B^2*b*d*g*\log(e)^2 + 2*A*B*b*d*g*\log(e))*x + 2*(B^2*a*d*g*\log(e) + A*B*a*d*g + (B^2*b*d*g*\log(e) + A*B*b*d*g)*x)*\log((b*x + a)^n) - 2*(B^2*a*d*g*\log(e) + A*B*a*d*g - (b*c*g*n - a*d*g*n)*B^2*\log(d*x + c) + ((g*n + g*\log(e))*B^2*b*d + A*B*b*d*g)*x + (B^2*b*d*g*x + B^2*a*d*g)*\log((b*x + a)^n))*\log((d*x + c)^n)/(d^2*i*x + c*d*i), x)$

---

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{A^2bgx + A^2ag + (B^2bgx + B^2ag) \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2(ABbgx + ABag) \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}{dix + ci}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i),x, algorithm="fricas")

[Out] integral((A^2\*b\*g\*x + A^2\*a\*g + (B^2\*b\*g\*x + B^2\*a\*g)\*log(e\*((b\*x + a)/(d\*x + c))^n))^2 + 2\*(A\*B\*b\*g\*x + A\*B\*a\*g)\*log(e\*((b\*x + a)/(d\*x + c))^n))/(d\*i\*x + c\*i), x)

---

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag) \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2}{dix + ci} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x, alg
orithm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(d*i*x + c
*i), x)
```

$$3.189 \quad \int \frac{\left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{ci+dx} dx$$

**Optimal.** Leaf size=137

$$\frac{2Bn \text{PolyLog} \left( 2, \frac{d(a+bx)}{b(c+dx)} \right) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{di} + \frac{2B^2 n^2 \text{PolyLog} \left( 3, \frac{d(a+bx)}{b(c+dx)} \right)}{di} - \frac{\log \left( \frac{bc-ad}{b(c+dx)} \right) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)^2}{di}$$

[Out] -(((A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2\*Log[(b\*c - a\*d)/(b\*(c + d\*x))])/(d\*i)) - (2\*B\*n\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*PolyLog[2, (d\*(a + b\*x))/(b\*(c + d\*x))])/(d\*i) + (2\*B^2\*n^2\*PolyLog[3, (d\*(a + b\*x))/(b\*(c + d\*x))])/(d\*i)

**Rubi [B]** time = 3.17201, antiderivative size = 782, normalized size of antiderivative = 5.71, number of steps used = 45, number of rules used = 23, integrand size = 35,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.657$ , Rules used = {2524, 2528, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 12, 6742, 2499, 2396, 2433, 2374, 6589, 2302, 30, 2500, 2375, 2317, 2440, 2434}

$$\frac{2ABn \text{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right)}{di} + \frac{2B^2 n \text{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right) \left( -\log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + \log((a+bx)^n) + \log((c+dx)^{-n}) \right)}{di} - \frac{2B^2 n^2 \text{PolyLog} \left( 3, \frac{b(c+dx)}{bc-ad} \right)}{di}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2/(c\*i + d\*i\*x),x]

[Out] (B^2\*Log[(a + b\*x)^n]^2\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]/(d\*i) - (B^2\*Log[(a + b\*x)^n]^2\*Log[i\*(c + d\*x)]/(d\*i) + (A\*B\*n\*Log[i\*(c + d\*x)]^2)/(d\*i) - (B^2\*n^2\*Log[a + b\*x]\*Log[i\*(c + d\*x)]^2)/(d\*i) + (B^2\*n^2\*Log[-((d\*(a + b\*x))/(b\*c - a\*d))]\*Log[i\*(c + d\*x)]^2)/(d\*i) + (B^2\*n^2\*Log[i\*(c + d\*x)]^3)/(3\*d\*i) - (2\*B^2\*n\*Log[a + b\*x]\*Log[i\*(c + d\*x)]\*Log[(c + d\*x)^(-n)]/(d\*i) - (B^2\*Log[a + b\*x]\*Log[(c + d\*x)^(-n)]^2)/(d\*i) + (B^2\*Log[-((d\*(a + b\*x))/(b\*c - a\*d))]\*Log[(c + d\*x)^(-n)]^2)/(d\*i) - (2\*A\*B\*n\*Log[-((d\*(a + b\*x))/(b\*c - a\*d))]\*Log[c\*i + d\*i\*x])/(d\*i) + ((A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2\*Log[c\*i + d\*i\*x])/(d\*i) + (2\*B^2\*n\*Log[-((d\*(a + b\*x))/(b\*c - a\*d))]\*(Log[(a + b\*x)^n] - Log[e\*((a + b\*x)/(c + d\*x))^n] + Log[(c + d\*x)^(-n)])\*Log[c\*i + d\*i\*x])/(d\*i) - (B^2\*n^2\*Log[-((d\*(a + b\*x))/(b\*c - a\*d))]\*Log[c\*i + d\*i\*x]^2)/(d\*i) + (B^2\*n\*Log[e\*((a + b\*x)/(c + d\*x))^n]\*Log[c\*i + d\*i\*x]^2)/(d\*i) + (2\*B^2\*n\*Log[(a + b\*x)^n]\*PolyLog[2, -((d\*(a + b\*x))/(b\*c - a\*d))])/(d\*i) - (2\*A\*B\*n\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)]/(d\*i) - (2\*B^2

$$2^n \text{Log}[(c + dx)^{-n}] \text{PolyLog}[2, (b(c + dx))/(bc - ad)]/(d^n) + (2B)^{2n} (\text{Log}[(a + bx)^n] - \text{Log}[e((a + bx)/(c + dx))^n] + \text{Log}[(c + dx)^{-n}]) \text{PolyLog}[2, (b(c + dx))/(bc - ad)]/(d^n) - (2B)^{2n} \text{PolyLog}[3, -(d(a + bx))/(bc - ad)]/(d^n) - (2B)^{2n} \text{PolyLog}[3, (b(c + dx))/(bc - ad)]/(d^n)$$

#### Rule 2524

$$\text{Int}[(a + \text{Log}[(c + dx)^p] (b + ex)^n) / (d + e x), x_{\text{Symbol}}] \rightarrow \text{Simp}[(\text{Log}[d + ex] (a + b \text{Log}[c + dx]^p))^n / e, x] - \text{Dist}[(b^n p) / e, \text{Int}[(\text{Log}[d + ex] (a + b \text{Log}[c + dx]^p))^{n-1} D[\text{Log}[c + dx], x] / \text{Log}[c + dx], x] /; \text{FreeQ}\{a, b, c, d, e, p\}, x] \&\& \text{RationalFunctionQ}[\text{Log}[c + dx], x] \&\& \text{IGtQ}[n, 0]$$

#### Rule 2528

$$\text{Int}[(a + \text{Log}[(c + dx)^p] (b + ex)^n) (R + Gx), x_{\text{Symbol}}] \rightarrow \text{With}[\{u = \text{ExpandIntegrand}[(a + b \text{Log}[c + dx]^p)^n, R + Gx, x]\}, \text{Int}[u, x] /; \text{SumQ}[u] /; \text{FreeQ}\{a, b, c, p\}, x] \&\& \text{RationalFunctionQ}[\text{Log}[c + dx], x] \&\& \text{RationalFunctionQ}[R + Gx, x] \&\& \text{IGtQ}[n, 0]$$

#### Rule 2418

$$\text{Int}[(a + \text{Log}[(c + dx)^p] (b + ex)^n) (d + e x)^p, x_{\text{Symbol}}] \rightarrow \text{With}[\{u = \text{ExpandIntegrand}[(a + b \text{Log}[c + dx]^p)^n, d + e x, x]\}, \text{Int}[u, x] /; \text{SumQ}[u] /; \text{FreeQ}\{a, b, c, d, e, n\}, x] \&\& \text{RationalFunctionQ}[\text{Log}[c + dx], x] \&\& \text{IntegerQ}[p]$$

#### Rule 2390

$$\text{Int}[(a + \text{Log}[(c + dx)^p] (b + ex)^n) ((f + g x)^q), x_{\text{Symbol}}] \rightarrow \text{Dist}[1/e, \text{Subst}[\text{Int}[(f + g x)^q (a + b \text{Log}[c + dx]^p)^n, x], x, d + e x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, n, p, q\}, x] \&\& \text{EQ}[e f - d g, 0]$$

#### Rule 2301

$$\text{Int}[(a + \text{Log}[(c + dx)^p] (b + ex)^n) / (x), x_{\text{Symbol}}] \rightarrow \text{Simp}[(a + b \text{Log}[c + dx]^p)^{2n} / (2b^n), x] /; \text{FreeQ}\{a, b, c, n\}, x]$$

#### Rule 2394

$$\text{Int}[(a + \text{Log}[(c + dx)^p] (b + ex)^n) / ((f + g x)(d + e x)), x_{\text{Symbol}}] \rightarrow \text{Simp}[(\text{Log}[(e(f + g x)) / (e f - d g)] (a + b \text{Log}[c + dx]^p))^n] / g, x] - \text{Dist}[(b e^n) / g, \text{Int}[\text{Log}[(e(f + g x)) / (e f - d g)] / (d + e x), x]]$$

, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))])\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] := -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rule 6688

Int[u\_, x\_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifierIntegrandQ[v, u, x]]

### Rule 12

Int[(a\_)\*(u\_), x\_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b\_)\*(v\_) /; FreeQ[b, x]]

### Rule 6742

Int[u\_, x\_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]

### Rule 2499

Int[(Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_)^(p\_.))\*((c\_.) + (d\_.)\*(x\_)^(q\_.))^(r\_.)))\*((s\_.) + Log[(i\_.)\*((g\_.) + (h\_.)\*(x\_)^(n\_.))]\*(t\_.)^(m\_.)))/((j\_.) + (k\_.)\*(x\_)), x\_Symbol] := Simp[((s + t\*Log[i\*(g + h\*x)^n])^(m + 1)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r)/(k\*n\*t\*(m + 1)), x] + (-Dist[(b\*p\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(a + b\*x), x], x] - Dist[(d\*q\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(c + d\*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0] && EqQ[h\*j - g\*k, 0] && IGtQ[m, 0]

### Rule 2396

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))])\*(b\_.)^(p\_)/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])^p)/g, x] - Dist[(b\*e\*n\*p)/g, Int[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]



$(a + b \log[c(d + ex)^n])^{p-1} / (d + ex), x, x$  /; FreeQ[{a, b, c, d, e, f, g, n, p}, x] && NeQ[e\*f - d\*g, 0] && IGtQ[p, 1]

### Rule 2433

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_.) + Log[(h\_.)\*((i\_.) + (j\_.)\*(x\_))^(m\_.)]\*(g\_.))\*((k\_.) + (l\_.)\*(x\_))^(r\_.), x\_Symbol] := Dist[1/e, Subst[Int[((k\*x)/d)^r\*(a + b\*Log[c\*x^n])^p\*(f + g\*Log[h\*(e\*i - d\*j)/e + (j\*x)/e]^m)], x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e\*k - d\*l, 0]

### Rule 2374

Int[(Log[(d\_.)\*((e\_) + (f\_.)\*(x\_)^(m\_.))]\*((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.))/(x\_), x\_Symbol] := -Simp[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^p)/m, x] + Dist[(b\*n\*p)/m, Int[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^(p-1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0] && EqQ[d\*e, 1]

### Rule 6589

Int[PolyLog[n\_, (c\_.)\*((a\_.) + (b\_.)\*(x\_)^(p\_.))]/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] := Simp[PolyLog[n + 1, c\*(a + b\*x)^p]/(e\*p), x] /; FreeQ[{a, b, c, d, e, n, p}, x] && EqQ[b\*d, a\*e]

### Rule 2302

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/(x\_), x\_Symbol] := Dist[1/(b\*n), Subst[Int[x^p, x], x, a + b\*Log[c\*x^n]], x] /; FreeQ[{a, b, c, n, p}, x]

### Rule 30

Int[(x\_)^(m\_.), x\_Symbol] := Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && NeQ[m, -1]

### Rule 2500

Int[(Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_)^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]\*((s\_.) + Log[(i\_.)\*((g\_.) + (h\_.)\*(x\_))^(n\_.)]\*(t\_.)))/((j\_.) + (k\_.)\*(x\_)), x\_Symbol] := Dist[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q)^r] - Log[(a + b\*x)^(p\*r)] - Log[(c + d\*x)^(q\*r)], Int[(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x], x] + (Int[(Log[(a + b\*x)^(p\*r)]\*(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x] + Int[(Log[(c + d\*x)^(q\*r)]\*(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ

$[b*c - a*d, 0]$

### Rule 2375

$\text{Int}[(\text{Log}[(d_.) * ((e_.) + (f_.) * (x_)^{(m_.)})^{(r_.)}] * ((a_.) + \text{Log}[(c_.) * (x_)^{(n_.)}]) * (b_.))^{(p_.)}] / (x_), x\_Symbol] \rightarrow \text{Simp}[(\text{Log}[d * (e + f * x^m)^r] * (a + b * \text{Log}[c * x^n])^{(p + 1)}) / (b * n * (p + 1)), x] - \text{Dist}[(f * m * r) / (b * n * (p + 1)), \text{Int}[(x^{(m - 1)} * (a + b * \text{Log}[c * x^n])^{(p + 1)}) / (e + f * x^m), x], x] /; \text{FreeQ}\{a, b, c, d, e, f, r, m, n\}, x] \&\& \text{IGtQ}[p, 0] \&\& \text{NeQ}[d * e, 1]$

### Rule 2317

$\text{Int}[(a_.) + \text{Log}[(c_.) * (x_)^{(n_.)}] * (b_.)]^{(p_.)} / ((d_.) + (e_.) * (x_)), x\_Symbol] \rightarrow \text{Simp}[(\text{Log}[1 + (e * x) / d] * (a + b * \text{Log}[c * x^n])^p) / e, x] - \text{Dist}[(b * n * p) / e, \text{Int}[(\text{Log}[1 + (e * x) / d] * (a + b * \text{Log}[c * x^n])^{(p - 1)}) / x, x], x] /; \text{FreeQ}\{a, b, c, d, e, n\}, x] \&\& \text{IGtQ}[p, 0]$

### Rule 2440

$\text{Int}[(a_.) + \text{Log}[(c_.) * ((d_.) + (e_.) * (x_))^{(n_.)}] * (b_.)] * ((f_.) + \text{Log}[(h_.) * ((i_.) + (j_.) * (x_))^{(m_.)}] * (g_.)) * ((k_.) + (l_.) * (x_))^{(r_.)}, x\_Symbol] \rightarrow \text{Dist}[1/l, \text{Subst}[\text{Int}[x^r * (a + b * \text{Log}[c * ((e * k - d * l) / l) + (e * x) / l]^n] * (f + g * \text{Log}[h * ((j * k - i * l) / l) + (j * x) / l]^m]), x], x, k + l * x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h, i, j, k, l, m, n\}, x] \&\& \text{IntegerQ}[r]$

### Rule 2434

$\text{Int}[(a_.) + \text{Log}[(c_.) * ((d_.) + (e_.) * (x_))^{(n_.)}] * (b_.)] * ((f_.) + \text{Log}[(h_.) * ((i_.) + (j_.) * (x_))^{(m_.)}] * (g_.)) / (x_), x\_Symbol] \rightarrow \text{Simp}[\text{Log}[x] * (a + b * \text{Log}[c * (d + e * x)^n]) * (f + g * \text{Log}[h * (i + j * x)^m]), x] + (-\text{Dist}[e * g * m, \text{Int}[(\text{Log}[x] * (a + b * \text{Log}[c * (d + e * x)^n]) / (d + e * x), x], x] - \text{Dist}[b * j * n, \text{Int}[(\text{Log}[x] * (f + g * \text{Log}[h * (i + j * x)^m]) / (i + j * x), x], x]) /; \text{FreeQ}\{a, b, c, d, e, f, g, h, i, j, m, n\}, x] \&\& \text{EqQ}[e * i - d * j, 0]$

### Rubi steps

$$\begin{aligned}
\int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{189c + 189dx} dx &= \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 \log(189c + 189dx)}{189d} - \frac{(2Bn) \int \frac{(c+dx)\left(-\frac{d(a+bx)}{(c+dx)^2} + \frac{b}{c+dx}\right)\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{189d}}{189d} \\
&= \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 \log(189c + 189dx)}{189d} - \frac{(2Bn) \int \frac{(bc-ad)\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) \log(189c + 189dx)}{(a+bx)(c+dx)}}{189d} \\
&= \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 \log(189c + 189dx)}{189d} - \frac{(2B(bc - ad)n) \int \frac{\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) \log(189c + 189dx)}{(a+bx)(c+dx)}}{189d} \\
&= \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 \log(189c + 189dx)}{189d} - \frac{(2B(bc - ad)n) \int \left(\frac{d\left(-A - B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)(c+dx)}\right) \log(189c + 189dx)}{189d} \\
&= \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 \log(189c + 189dx)}{189d} - \frac{1}{189}(2Bn) \int \frac{\left(-A - B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) \log(189c + 189dx)}{c + dx} \\
&= \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 \log(189c + 189dx)}{189d} - \frac{1}{189}(2Bn) \int \left(\frac{A \log(189c + 189dx)}{-c - dx} + \frac{B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) \log(189c + 189dx)}{-c - dx}\right) dx \\
&= \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 \log(189c + 189dx)}{189d} - \frac{1}{189}(2ABn) \int \frac{\log(189c + 189dx)}{-c - dx} dx \\
&= -\frac{2ABn \log\left(-\frac{d(a+bx)}{bc-ad}\right) \log(189c + 189dx)}{189d} + \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 \log(189c + 189dx)}{189d} \\
&= -\frac{2ABn \log\left(-\frac{d(a+bx)}{bc-ad}\right) \log(189c + 189dx)}{189d} + \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 \log(189c + 189dx)}{189d} \\
&= -\frac{B^2 \log^2\left((a + bx)^n\right) \log(189(c + dx))}{189d} + \frac{ABn \log^2(189(c + dx))}{189d} - \frac{2B^2n \log(a + bx) \log(189(c + dx))}{189d} \\
&= -\frac{B^2 \log^2\left((a + bx)^n\right) \log(189(c + dx))}{189d} + \frac{ABn \log^2(189(c + dx))}{189d} + \frac{B^2 \log^2\left((a + bx)^n\right)}{189d} \\
&= -\frac{B^2 \log^2\left((a + bx)^n\right) \log(189(c + dx))}{189d} + \frac{ABn \log^2(189(c + dx))}{189d} - \frac{B^2n^2 \log(a + bx) \log(189(c + dx))}{189d}
\end{aligned}$$

**Mathematica [B]** time = 0.278505, size = 306, normalized size = 2.23

$$-Bn \left( -2 \left( \text{PolyLog} \left( 2, \frac{d(a+bx)}{ad-bc} \right) + \log \left( \frac{a}{b} + x \right) \log \left( \frac{b(c+dx)}{bc-ad} \right) \right) + 2 \log(c+dx) \left( -\log \left( \frac{a+bx}{c+dx} \right) + \log \left( \frac{a}{b} + x \right) - \log \left( \frac{c}{d} + x \right) \right) + \dots \right)$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2/(c\*i + d\*i\*x),x]

[Out] ((A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n] - B\*n\*Log[(a + b\*x)/(c + d\*x)])^2\*Log[c + d\*x] - B\*n\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n] - B\*n\*Log[(a + b\*x)/(c + d\*x)])\*(Log[c/d + x]^2 + 2\*(Log[a/b + x] - Log[c/d + x] - Log[(a + b\*x)/(c + d\*x)])\*Log[c + d\*x] - 2\*(Log[a/b + x]\*Log[(b\*(c + d\*x))/(b\*c - a\*d)] + PolyLog[2, (d\*(a + b\*x))/(-b\*c + a\*d)])) - B^2\*n^2\*(Log[(a + b\*x)/(c + d\*x)]^2\*Log[(b\*c - a\*d)/(b\*c + b\*d\*x)] + 2\*Log[(a + b\*x)/(c + d\*x)]\*PolyLog[2, (d\*(a + b\*x))/(b\*(c + d\*x))] - 2\*PolyLog[3, (d\*(a + b\*x))/(b\*(c + d\*x))]))/(d\*i)

**Maple [F]** time = 0.519, size = 0, normalized size = 0.

$$\int \frac{1}{dix + ci} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i),x)

[Out] int((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i),x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$\frac{B^2 \log(dx + c) \log((dx + c)^n)^2}{di} + \frac{A^2 \log(dix + ci)}{di} - \int -\frac{B^2 \log((bx + a)^n)^2 + B^2 \log(e)^2 + 2AB \log(e) + 2(B^2 \log(e) \cdot \dots)}{di}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i),x, algorithm="maxima")

[Out]  $B^2 \log(dx + c) \log((dx + c)^n)^2 / (d^2i) + A^2 \log(d^2ix + c^2i) / (d^2i) - \text{integrate}(- (B^2 \log((bx + a)^n)^2 + B^2 \log(e)^2 + 2AB \log(e) + 2(B^2 \log(e) + AB) \log((bx + a)^n) - 2(B^2 n \log(dx + c) + B^2 \log((bx + a)^n) + B^2 \log(e) + AB) \log((dx + c)^n)) / (d^2ix + c^2i), x)$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{B^2 \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right)^2 + 2AB \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A^2}{dix + ci}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x, algorithm="fricas")`

[Out] `integral((B^2*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*A*B*log(e*((b*x + a)/(d*x + c))^n) + A^2)/(d*i*x + c*i), x)`

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x)`

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2}{dix + ci} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i),x, algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(d*i*x + c*i), x)
```

$$3.190 \quad \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)(ci+dix)} dx$$

Optimal. Leaf size=50

$$\frac{\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)^3}{3Bgin(bc - ad)}$$

[Out] (A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^3/(3\*B\*(b\*c - a\*d)\*g\*i\*n)

**Rubi [C]** time = 5.32237, antiderivative size = 1237, normalized size of antiderivative = 24.74, number of steps used = 59, number of rules used = 29, integrand size = 45,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.644$ , Rules used = {2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 12, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

$$\frac{B^2 n^2 \log^3(c + dx)}{3(bc - ad)gi} - \frac{ABn \log^2(c + dx)}{(bc - ad)gi} + \frac{B^2 n^2 \log(a + bx) \log^2(c + dx)}{(bc - ad)gi} - \frac{B^2 n \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) \log^2(c + dx)}{(bc - ad)gi} + \frac{B^2 \log^2}{(bc - ad)gi}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2/((a\*g + b\*g\*x)\*(c\*i + d\*i\*x)), x]

[Out] -((A\*B\*n\*Log[a + b\*x]^2)/((b\*c - a\*d)\*g\*i)) - (B^2\*Log[-((b\*c - a\*d)/(d\*(a + b\*x))])\*Log[e\*((a + b\*x)/(c + d\*x))^n]^2)/((b\*c - a\*d)\*g\*i) - (B^2\*Log[a + b\*x]\*Log[e\*((a + b\*x)/(c + d\*x))^n]^2)/((b\*c - a\*d)\*g\*i) + (Log[a + b\*x]\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/((b\*c - a\*d)\*g\*i) + (2\*A\*B\*n\*Log[-((d\*(a + b\*x))/(b\*c - a\*d))]\*Log[c + d\*x])/((b\*c - a\*d)\*g\*i) + (B^2\*Log[(a + b\*x)^n]^2\*Log[c + d\*x])/((b\*c - a\*d)\*g\*i) - ((A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2\*Log[c + d\*x])/((b\*c - a\*d)\*g\*i) - (A\*B\*n\*Log[c + d\*x]^2)/((b\*c - a\*d)\*g\*i) + (B^2\*n^2\*Log[a + b\*x]\*Log[c + d\*x]^2)/((b\*c - a\*d)\*g\*i) - (B^2\*n\*Log[e\*((a + b\*x)/(c + d\*x))^n]\*Log[c + d\*x]^2)/((b\*c - a\*d)\*g\*i) - (B^2\*n^2\*Log[c + d\*x]^3)/(3\*(b\*c - a\*d)\*g\*i) + (2\*A\*B\*n\*Log[a + b\*x]\*Log[(b\*(c + d\*x))/(b\*c - a\*d)])/((b\*c - a\*d)\*g\*i) - (B^2\*Log[(a + b\*x)^n]^2\*Log[(b\*(c + d\*x))/(b\*c - a\*d)])/((b\*c - a\*d)\*g\*i) + (2\*B^2\*n\*Log[a + b\*x]\*Log[c + d\*x]\*Log[(c + d\*x)^(-n)])/((b\*c - a\*d)\*g\*i) + (B^2\*Log[a + b\*x]\*Log[(c + d\*x)^(-n)]^2)/((b\*c - a\*d)\*g\*i) - (B^2\*Log[-((d\*(a + b\*x))/(b\*c - a\*d))]\*Log[

$$\begin{aligned} & (c + dx)^{-n} / ((bc - a*d)*g^i) - (2*B^2*n*\text{Log}[-((d*(a + b*x))/(bc - a*d))]*\text{Log}[c + d*x]*(\text{Log}[(a + b*x)^n] - \text{Log}[e*((a + b*x)/(c + d*x))^n] + \text{Log}[(c + d*x)^{-n}])) / ((bc - a*d)*g^i) + (2*A*B*n*\text{PolyLog}[2, -((d*(a + b*x))/(bc - a*d))]) / ((bc - a*d)*g^i) - (2*B^2*n*\text{Log}[(a + b*x)^n]*\text{PolyLog}[2, -((d*(a + b*x))/(bc - a*d))]) / ((bc - a*d)*g^i) + (2*A*B*n*\text{PolyLog}[2, (b*(c + d*x))/(bc - a*d)]) / ((bc - a*d)*g^i) + (2*B^2*n*\text{Log}[(c + d*x)^{-n}]*\text{PolyLog}[2, (b*(c + d*x))/(bc - a*d)]) / ((bc - a*d)*g^i) - (2*B^2*n*(\text{Log}[(a + b*x)^n] - \text{Log}[e*((a + b*x)/(c + d*x))^n] + \text{Log}[(c + d*x)^{-n}])* \text{PolyLog}[2, (b*(c + d*x))/(bc - a*d)]) / ((bc - a*d)*g^i) + (2*B^2*n*\text{Log}[e*((a + b*x)/(c + d*x))^n]*\text{PolyLog}[2, 1 + (bc - a*d)/(d*(a + b*x))]) / ((bc - a*d)*g^i) + (2*B^2*n^2*\text{PolyLog}[3, -((d*(a + b*x))/(bc - a*d))]) / ((bc - a*d)*g^i) + (2*B^2*n^2*\text{PolyLog}[3, (b*(c + d*x))/(bc - a*d)]) / ((bc - a*d)*g^i) + (2*B^2*n^2*\text{PolyLog}[3, 1 + (bc - a*d)/(d*(a + b*x))]) / ((bc - a*d)*g^i) \end{aligned}$$
Rule 2528

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x] }, Int[u, x] /; SumQ[u]
] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(Rfx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, Rfx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[Rfx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
```



$g[c*x^n]^2/(2*b*n), x] /; \text{FreeQ}\{a, b, c, n\}, x]$

#### Rule 2394

$\text{Int}[(a_.) + \text{Log}[(c_.)*((d_.) + (e_.)*(x_))^{(n_.)}]* (b_.)]/((f_.) + (g_.)*(x_)), x\_Symbol] :> \text{Simp}[(\text{Log}[(e*(f + g*x))/(e*f - d*g)]*(a + b*\text{Log}[c*(d + e*x)^n]))/g, x] - \text{Dist}[(b*e^n)/g, \text{Int}[\text{Log}[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, n\}, x] \&\& \text{NeQ}[e*f - d*g, 0]$

#### Rule 2393

$\text{Int}[(a_.) + \text{Log}[(c_.)*((d_.) + (e_.)*(x_))]* (b_.)]/((f_.) + (g_.)*(x_)), x\_Symbol] :> \text{Dist}[1/g, \text{Subst}[\text{Int}[(a + b*\text{Log}[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g\}, x] \&\& \text{NeQ}[e*f - d*g, 0] \&\& \text{EqQ}[g + c*(e*f - d*g), 0]$

#### Rule 2391

$\text{Int}[\text{Log}[(c_.)*((d_.) + (e_.)*(x_))^{(n_.)})]/(x_), x\_Symbol] :> -\text{Simp}[\text{PolyLog}[2, -(c*e*x^n)]/n, x] /; \text{FreeQ}\{c, d, e, n\}, x] \&\& \text{EqQ}[c*d, 1]$

#### Rule 6688

$\text{Int}[u_, x\_Symbol] :> \text{With}\{v = \text{SimplifyIntegrand}[u, x]\}, \text{Int}[v, x] /; \text{SimplerIntegrandQ}[v, u, x]$

#### Rule 12

$\text{Int}[(a_)*(u_), x\_Symbol] :> \text{Dist}[a, \text{Int}[u, x], x] /; \text{FreeQ}[a, x] \&\& \text{!MatchQ}[u, (b_)*(v_)] /; \text{FreeQ}[b, x]$

#### Rule 6742

$\text{Int}[u_, x\_Symbol] :> \text{With}\{v = \text{ExpandIntegrand}[u, x]\}, \text{Int}[v, x] /; \text{SumQ}[v]$

#### Rule 2411

$\text{Int}[(a_.) + \text{Log}[(c_.)*((d_.) + (e_.)*(x_))^{(n_.)}]* (b_.)^{(p_.)}]/((f_.) + (g_.)*(x_))^{(q_.)}*((h_.) + (i_.)*(x_))^{(r_.)}, x\_Symbol] :> \text{Dist}[1/e, \text{Subst}[\text{Int}[(g*x)/e]^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*\text{Log}[c*x^n])^p, x], x, d + e*x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h, i, n, p, q, r\}, x] \&\& \text{EqQ}[e*f - d*g, 0] \&\& (\text{IGtQ}[p, 0] || \text{IGtQ}[r, 0]) \&\& \text{IntegerQ}[2*r]$

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
  x_Symbol] := Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] := Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
  Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] := With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
h*x)^t]^u)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s + 1))/(p*r*(s + 1)*(b*c
- a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q]^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
EqQ[p + q, 0] && NeQ[s, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] := -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q]^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] := With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

Int[(u\_)\*PolyLog[n\_, v\_], x\_Symbol] := With[{w = DerivativeDivides[v, u\*v, x]}, Simp[w\*PolyLog[n + 1, v], x] /; !FalseQ[w]] /; FreeQ[n, x]

Rule 2500

Int[(Log[(e\_)\*((f\_)\*(a\_) + (b\_)\*(x\_))^(p\_)\*((c\_) + (d\_)\*(x\_))^(q\_)]^(r\_))\*((s\_) + Log[(i\_)\*(g\_) + (h\_)\*(x\_)]^(n\_))\*((t\_)))/((j\_) + (k\_)\*(x\_)), x\_Symbol] := Dist[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q)^r] - Log[(a + b\*x)^(p\*r)] - Log[(c + d\*x)^(q\*r)], Int[(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x], x] + (Int[(Log[(a + b\*x)^(p\*r)]\*(s + t\*Log[i\*(g + h\*x)^n]))/(j + k\*x), x] + Int[(Log[(c + d\*x)^(q\*r)]\*(s + t\*Log[i\*(g + h\*x)^n]))/(j + k\*x), x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0]

Rule 2433

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_))^(n\_)]\*(b\_))^(p\_)\*((f\_) + Log[(h\_)\*((i\_) + (j\_)\*(x\_))^(m\_)]\*(g\_))\*((k\_) + (l\_)\*(x\_))^(r\_), x\_Symbol] := Dist[1/e, Subst[Int[((k\*x)/d)^r\*(a + b\*Log[c\*x^n])^p\*(f + g\*Log[h\*(e\*i - d\*j)/e + (j\*x)/e]^m)], x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e\*k - d\*1, 0]

Rule 2375

Int[(Log[(d\_)\*((e\_) + (f\_)\*(x\_))^(m\_)]^(r\_))\*((a\_) + Log[(c\_)\*(x\_))^(n\_)]\*(b\_))^(p\_)/(x\_), x\_Symbol] := Simp[(Log[d\*(e + f\*x^m)^r]\*(a + b\*Log[c\*x^n])^(p + 1))/(b\*n\*(p + 1)), x] - Dist[(f\*m\*r)/(b\*n\*(p + 1)), Int[(x^(m - 1)\*(a + b\*Log[c\*x^n])^(p + 1))/(e + f\*x^m), x], x] /; FreeQ[{a, b, c, d, e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d\*e, 1]

Rule 2374

Int[(Log[(d\_)\*((e\_) + (f\_)\*(x\_))^(m\_))]\*((a\_) + Log[(c\_)\*(x\_))^(n\_)]\*(b\_))^(p\_)/(x\_), x\_Symbol] := -Simp[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^p)/m, x] + Dist[(b\*n\*p)/m, Int[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0] && EqQ[d\*e, 1]

Rule 6589

Int[PolyLog[n\_, (c\_)\*((a\_) + (b\_)\*(x\_))^(p\_)]/((d\_) + (e\_)\*(x\_)), x\_Symbol] := Simp[PolyLog[n + 1, c\*(a + b\*x)^p]/(e\*p), x] /; FreeQ[{a, b, c, d

, e, n, p}, x] && EqQ[b\*d, a\*e]

### Rule 2440

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))\*((f\_.) + Log[(h\_.) \*((i\_.) + (j\_.)\*(x\_))^(m\_.)]\*(g\_.))\*((k\_) + (l\_.)\*(x\_))^(r\_.), x\_Symbol] :> Dist[1/l, Subst[Int[x^r\*(a + b\*Log[c\*(-((e\*k - d\*l)/l) + (e\*x)/l)^n])\*(f + g\*Log[h\*(-((j\*k - i\*l)/l) + (j\*x)/l)^m]), x], x, k + l\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]

### Rule 2434

Int[(((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))\*((f\_.) + Log[(h\_.) \*((i\_.) + (j\_.)\*(x\_))^(m\_.)]\*(g\_.)))/(x\_), x\_Symbol] :> Simp[Log[x]\*(a + b\*Log[c\*(d + e\*x)^n])\*(f + g\*Log[h\*(i + j\*x)^m]), x] + (-Dist[e\*g\*m, Int[(Log[x]\*g\*(a + b\*Log[c\*(d + e\*x)^n])]/(d + e\*x), x], x] - Dist[b\*j\*n, Int[(Log[x]\*f + g\*Log[h\*(i + j\*x)^m])]/(i + j\*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, m, n}, x] && EqQ[e\*i - d\*j, 0]

### Rule 2499

Int[(Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.) )^(r\_.)]\*(((s\_.) + Log[(i\_.)\*((g\_.) + (h\_.)\*(x\_))^(n\_.)]\*(t\_.))^(m\_.))/((j\_.) + (k\_.)\*(x\_)), x\_Symbol] :> Simp[((s + t\*Log[i\*(g + h\*x)^n])^(m + 1)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r)/(k\*n\*t\*(m + 1)), x] + (-Dist[(b\*p\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(a + b\*x), x], x] - Dist[(d\*q\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(c + d\*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0] && EqQ[h\*j - g\*k, 0] && IGtQ[m, 0]

### Rule 2396

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_)/((f\_.) + (g\_.) \* (x\_)), x\_Symbol] :> Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])^p)/g, x] - Dist[(b\*e\*n\*p)/g, Int[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])^(p - 1))/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p}, x] && NeQ[e\*f - d\*g, 0] && IGtQ[p, 1]

### Rule 2302

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_)/(x\_), x\_Symbol] :> Dist[1/(b\*n), Subst[Int[x^p, x], x, a + b\*Log[c\*x^n]], x] /; FreeQ[{a, b, c, n, p}, x]

Rule 30

`Int[(x_)^(m_.), x_Symbol] := Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && NeQ[m, -1]`

Rubi steps

$$\begin{aligned}
\int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(190c + 190dx)(ag + bgx)} dx &= \int \left( \frac{b\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{190(bc - ad)g(a + bx)} - \frac{d\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{190(bc - ad)g(c + dx)} \right) dx \\
&= \frac{b \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx} dx}{190(bc - ad)g} - \frac{d \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx} dx}{190(bc - ad)g} \\
&= \frac{\log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{190(bc - ad)g} - \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 \log(c + dx)}{190(bc - ad)g} - \frac{(Bn) \int}{190(bc - ad)g} \\
&= \frac{\log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{190(bc - ad)g} - \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 \log(c + dx)}{190(bc - ad)g} - \frac{(Bn) \int}{190(bc - ad)g} \\
&= \frac{\log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{190(bc - ad)g} - \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 \log(c + dx)}{190(bc - ad)g} - \frac{(Bn) \int}{190(bc - ad)g} \\
&= \frac{\log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{190(bc - ad)g} - \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 \log(c + dx)}{190(bc - ad)g} - \frac{(Bn) \int}{190(bc - ad)g} \\
&= \frac{\log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{190(bc - ad)g} - \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 \log(c + dx)}{190(bc - ad)g} - \frac{(ABn) \int}{190(bc - ad)g} \\
&= -\frac{B^2 \log(a + bx) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{190(bc - ad)g} + \frac{\log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{190(bc - ad)g} - \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{190(bc - ad)g} \\
&= -\frac{B^2 \log\left(-\frac{bc-ad}{d(a+bx)}\right) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{190(bc - ad)g} - \frac{B^2 \log(a + bx) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{190(bc - ad)g} + \frac{\log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{190(bc - ad)g} \\
&= -\frac{ABn \log^2(a + bx)}{190(bc - ad)g} - \frac{B^2 \log\left(-\frac{bc-ad}{d(a+bx)}\right) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{190(bc - ad)g} - \frac{B^2 \log(a + bx) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{190(bc - ad)g} \\
&= -\frac{ABn \log^2(a + bx)}{190(bc - ad)g} - \frac{B^2 \log\left(-\frac{bc-ad}{d(a+bx)}\right) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{190(bc - ad)g} - \frac{B^2 \log(a + bx) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{190(bc - ad)g} \\
&= -\frac{ABn \log^2(a + bx)}{190(bc - ad)g} - \frac{B^2 \log\left(-\frac{bc-ad}{d(a+bx)}\right) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{190(bc - ad)g} - \frac{B^2 \log(a + bx) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{190(bc - ad)g}
\end{aligned}$$

**Mathematica [A]** time = 0.379888, size = 90, normalized size = 1.8

$$\frac{3A^2 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + 3AB \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + B^2 \log^3\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{3bcgin - 3adgin}$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2/((a\*g + b\*g\*x)\*(c\*i + d\*i\*x)), x]

[Out] (3\*A^2\*Log[e\*((a + b\*x)/(c + d\*x))^n] + 3\*A\*B\*Log[e\*((a + b\*x)/(c + d\*x))^n]^2 + B^2\*Log[e\*((a + b\*x)/(c + d\*x))^n]^3)/(3\*b\*c\*g\*i\*n - 3\*a\*d\*g\*i\*n)

**Maple [F]** time = 0.755, size = 0, normalized size = 0.

$$\int \frac{1}{(bgx + ag)(dix + ci)} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)/(d\*i\*x+c\*i), x)

[Out] int((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)/(d\*i\*x+c\*i), x)

**Maxima [B]** time = 1.3074, size = 549, normalized size = 10.98

$$B^2 \left( \frac{\log(bx + a)}{(bc - ad)gi} - \frac{\log(dx + c)}{(bc - ad)gi} \right) \log \left( e \left( \frac{bx}{dx + c} + \frac{a}{dx + c} \right)^n \right)^2 + 2AB \left( \frac{\log(bx + a)}{(bc - ad)gi} - \frac{\log(dx + c)}{(bc - ad)gi} \right) \log \left( e \left( \frac{bx}{dx + c} + \frac{a}{dx + c} \right)^n \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)/(d\*i\*x+c\*i), x, algorithm="maxima")

[Out] B^2\*(log(b\*x + a)/((b\*c - a\*d)\*g\*i) - log(d\*x + c)/((b\*c - a\*d)\*g\*i))\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n)^2 + 2\*A\*B\*(log(b\*x + a)/((b\*c - a\*d)\*g\*i)

$$\begin{aligned}
& - \log(dx + c) / ((bc - ad) * gi) * \log(e * (bx / (dx + c) + a / (dx + c))^n) + \\
& 1/3 * ((\log(bx + a)^3 - 3 * \log(bx + a)^2 * \log(dx + c) + 3 * \log(bx + a) * \log(dx + c)^2 - \log(dx + c)^3) * n^2 / (bc * gi - ad * gi) - 3 * (\log(bx + a)^2 - 2 * \log(bx + a) * \log(dx + c) + \log(dx + c)^2) * n * \log(e * (bx / (dx + c) + a / (dx + c))^n) / (bc * gi - ad * gi)) * B^2 - (\log(bx + a)^2 - 2 * \log(bx + a) * \log(dx + c) + \log(dx + c)^2) * A * B * n / (bc * gi - ad * gi) + A^2 * (\log(bx + a) / ((bc - ad) * gi) - \log(dx + c) / ((bc - ad) * gi))
\end{aligned}$$

**Fricas [B]** time = 0.482501, size = 339, normalized size = 6.78

$$\frac{B^2 n^2 \log\left(\frac{bx+a}{dx+c}\right)^3 + 3 B^2 \log(e)^2 \log\left(\frac{bx+a}{dx+c}\right) + 3 ABn \log\left(\frac{bx+a}{dx+c}\right)^2 + 3 A^2 \log\left(\frac{bx+a}{dx+c}\right) + 3 \left( B^2 n \log\left(\frac{bx+a}{dx+c}\right)^2 + 2 AB \log\left(\frac{bx+a}{dx+c}\right) \right)}{3(bc - ad)gi}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((bx+a)/(dx+c))^n))^2/(b\*gx+a\*g)/(d\*i\*x+c\*i),x, alg orithm="fricas")

[Out] 1/3\*(B^2\*n^2\*log((bx + a)/(dx + c))^3 + 3\*B^2\*log(e)^2\*log((bx + a)/(dx + c)) + 3\*A\*B\*n\*log((bx + a)/(dx + c))^2 + 3\*A^2\*log((bx + a)/(dx + c)) + 3\*(B^2\*n\*log((bx + a)/(dx + c))^2 + 2\*A\*B\*log((bx + a)/(dx + c)))\*log(e))/((bc - ad)\*gi)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*((bx+a)/(dx+c))^n))^2/(b\*gx+a\*g)/(d\*i\*x+c\*i),x)

[Out] Timed out

**Giac [B]** time = 1.34138, size = 217, normalized size = 4.34

$$-\frac{B^2 i n^2 \log\left(\frac{bx+a}{dx+c}\right)^3}{3(bc g - ad g)} - \frac{(ABin + B^2in) \log\left(\frac{bx+a}{dx+c}\right)^2}{bc g - ad g} - \frac{(A^2i + 2ABi + B^2i) \log\left(\left|\frac{2bdx+bc+ad-|bc+ad|}{2bdx+bc+ad+|bc+ad|}\right|\right)}{g|-bc + ad|}$$



Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i),x, algorithm="giac")
```

```
[Out] -1/3*B^2*i*n^2*log((b*x + a)/(d*x + c))^3/(b*c*g - a*d*g) - (A*B*i*n + B^2*i*n)*log((b*x + a)/(d*x + c))^2/(b*c*g - a*d*g) - (A^2*i + 2*A*B*i + B^2*i)*log(abs((2*b*d*x + b*c + a*d - abs(-b*c + a*d))/(2*b*d*x + b*c + a*d + abs(-b*c + a*d))))/(g*abs(-b*c + a*d))
```

$$3.191 \quad \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^2(ci+dix)} dx$$

**Optimal.** Leaf size=199

$$\frac{d\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)^3}{3Bg^2in(bc-ad)^2} - \frac{b(c+dx)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)^2}{g^2i(a+bx)(bc-ad)^2} - \frac{2bBn(c+dx)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{g^2i(a+bx)(bc-ad)^2} - \frac{2bB^2n^2(c+dx)}{g^2i(a+bx)}$$

[Out]  $(-2*b*B^2*n^2*(c+d*x))/((b*c-a*d)^2*g^2*i*(a+b*x)) - (2*b*B*n*(c+d*x)*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/((b*c-a*d)^2*g^2*i*(a+b*x)) - (b*(c+d*x)*(A+B*Log[e*((a+b*x)/(c+d*x))^n])^2)/((b*c-a*d)^2*g^2*i*(a+b*x)) - (d*(A+B*Log[e*((a+b*x)/(c+d*x))^n])^3)/(3*B*(b*c-a*d)^2*g^2*i*n)$

**Rubi [C]** time = 6.08801, antiderivative size = 1800, normalized size of antiderivative = 9.05, number of steps used = 83, number of rules used = 31, integrand size = 45,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.689$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

[In]  $\text{Int}[(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^2*(c*i + d*i*x)), x]$

[Out]  $(-2*B^2*n^2)/((b*c-a*d)*g^2*i*(a+b*x)) - (2*B^2*d*n^2*\text{Log}[a+b*x])/((b*c-a*d)^2*g^2*i) + (A*B*d*n*\text{Log}[a+b*x]^2)/((b*c-a*d)^2*g^2*i) + (B^2*d*n^2*\text{Log}[a+b*x]^2)/((b*c-a*d)^2*g^2*i) + (B^2*d*\text{Log}[-((b*c-a*d)/(d*(a+b*x))])* \text{Log}[e*((a+b*x)/(c+d*x))^n]^2)/((b*c-a*d)^2*g^2*i) + (B^2*d*\text{Log}[a+b*x]* \text{Log}[e*((a+b*x)/(c+d*x))^n]^2)/((b*c-a*d)^2*g^2*i) - (2*B*n*(A+B*\text{Log}[e*((a+b*x)/(c+d*x))^n]))/((b*c-a*d)*g^2*i*(a+b*x)) - (2*B*d*n*\text{Log}[a+b*x]*(A+B*\text{Log}[e*((a+b*x)/(c+d*x))^n]))/((b*c-a*d)^2*g^2*i) - (A+B*\text{Log}[e*((a+b*x)/(c+d*x))^n])^2/((b*c-a*d)*g^2*i*(a+b*x)) - (d*\text{Log}[a+b*x]*(A+B*\text{Log}[e*((a+b*x)/(c+d*x))^n])^2)/((b*c-a*d)^2*g^2*i) + (2*B^2*d*n^2*\text{Log}[c+d*x])/((b*c-a*d)^2*g^2*i) - (2*A*B*d*n*\text{Log}[-((d*(a+b*x))/(b*c-a*d))]* \text{Log}[c+d*x])/((b*c-a*d)^2*g^2*i) - (2*B^2*d*n^2*\text{Log}[-((d*(a+b*x))/(b*c-a*d))]* \text{Log}[c+d*x])/((b*c-a*d)$

$$\begin{aligned}
& ^2g^{2i}) - (B^2d \operatorname{Log}[(a + bx)^n]^2 \operatorname{Log}[c + dx]) / ((b^2c - a^2d)g^{2i}) + \\
& (2B^2dn(A + B \operatorname{Log}[e((a + bx)/(c + dx))^n]) \operatorname{Log}[c + dx]) / ((b^2c - a^2d) \\
& ^2g^{2i}) + (d(A + B \operatorname{Log}[e((a + bx)/(c + dx))^n])^2 \operatorname{Log}[c + dx]) / ((b^2c - \\
& - a^2d)g^{2i}) + (A^2B^2dn \operatorname{Log}[c + dx]^2) / ((b^2c - a^2d)g^{2i}) + (B^2d^2n \\
& ^2 \operatorname{Log}[c + dx]^2) / ((b^2c - a^2d)g^{2i}) - (B^2d^2n^2 \operatorname{Log}[a + bx] \operatorname{Log}[c + \\
& dx]) / ((b^2c - a^2d)g^{2i}) + (B^2d^2n \operatorname{Log}[e((a + bx)/(c + dx))^n] \operatorname{Log} \\
& [c + dx]^2) / ((b^2c - a^2d)g^{2i}) + (B^2d^2n^2 \operatorname{Log}[c + dx]^3) / (3(b^2c - \\
& a^2d)g^{2i}) - (2AB^2dn \operatorname{Log}[a + bx] \operatorname{Log}[(b(c + dx))/(b^2c - a^2d)]) / ((b \\
& ^2c - a^2d)g^{2i}) - (2B^2d^2n^2 \operatorname{Log}[a + bx] \operatorname{Log}[(b(c + dx))/(b^2c - a^2d \\
& )]) / ((b^2c - a^2d)g^{2i}) + (B^2d^2 \operatorname{Log}[(a + bx)^n]^2 \operatorname{Log}[(b(c + dx))/(b^2c \\
& - a^2d)]) / ((b^2c - a^2d)g^{2i}) - (2B^2d^2n \operatorname{Log}[a + bx] \operatorname{Log}[c + dx] \operatorname{Log} \\
& [(c + dx)^{-n}]) / ((b^2c - a^2d)g^{2i}) - (B^2d^2 \operatorname{Log}[a + bx] \operatorname{Log}[(c + dx) \\
& ^{-n}]^2) / ((b^2c - a^2d)g^{2i}) + (B^2d^2 \operatorname{Log}[-((d(a + bx))/(b^2c - a^2d))] * \\
& \operatorname{Log}[(c + dx)^{-n}]^2) / ((b^2c - a^2d)g^{2i}) + (2B^2d^2n \operatorname{Log}[-((d(a + bx) \\
& ))/(b^2c - a^2d)]) \operatorname{Log}[c + dx] * (\operatorname{Log}[(a + bx)^n] - \operatorname{Log}[e((a + bx)/(c + dx) \\
& )]^n + \operatorname{Log}[(c + dx)^{-n}])) / ((b^2c - a^2d)g^{2i}) - (2AB^2dn \operatorname{PolyLog}[2, \\
& -((d(a + bx))/(b^2c - a^2d))]) / ((b^2c - a^2d)g^{2i}) - (2B^2d^2n^2 \operatorname{PolyLo \\
& g}[2, -((d(a + bx))/(b^2c - a^2d))]) / ((b^2c - a^2d)g^{2i}) + (2B^2d^2n \operatorname{Log} \\
& [(a + bx)^n] \operatorname{PolyLog}[2, -((d(a + bx))/(b^2c - a^2d))]) / ((b^2c - a^2d)g^{2i} \\
& ) - (2AB^2dn \operatorname{PolyLog}[2, (b(c + dx))/(b^2c - a^2d)]) / ((b^2c - a^2d)g^{2i}) \\
& - (2B^2d^2n^2 \operatorname{PolyLog}[2, (b(c + dx))/(b^2c - a^2d)]) / ((b^2c - a^2d)g^{2i} \\
& ) - (2B^2d^2n \operatorname{Log}[(c + dx)^{-n}] \operatorname{PolyLog}[2, (b(c + dx))/(b^2c - a^2d)]) / ( \\
& (b^2c - a^2d)g^{2i}) + (2B^2d^2n (\operatorname{Log}[(a + bx)^n] - \operatorname{Log}[e((a + bx)/(c + \\
& dx))^n] + \operatorname{Log}[(c + dx)^{-n}]) \operatorname{PolyLog}[2, (b(c + dx))/(b^2c - a^2d)]) / ((b \\
& ^2c - a^2d)g^{2i}) - (2B^2d^2n \operatorname{Log}[e((a + bx)/(c + dx))^n] \operatorname{PolyLog}[2, 1 \\
& + (b^2c - a^2d)/(d(a + bx))]) / ((b^2c - a^2d)g^{2i}) - (2B^2d^2n^2 \operatorname{PolyLog} \\
& [3, -((d(a + bx))/(b^2c - a^2d))]) / ((b^2c - a^2d)g^{2i}) - (2B^2d^2n^2 \operatorname{Pol \\
& yLog}[3, (b(c + dx))/(b^2c - a^2d)]) / ((b^2c - a^2d)g^{2i}) - (2B^2d^2n^2 \operatorname{Pol \\
& yLog}[3, 1 + (b^2c - a^2d)/(d(a + bx))]) / ((b^2c - a^2d)g^{2i})
\end{aligned}$$

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x] }, Int[u, x] /; SumQ[u
] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]

```

### Rule 2525

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.
), x_Symbol] := Simp[ ((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n) / (e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[ ((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x]) / RFx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]

```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :=> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :=> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :=> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :=> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :=> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :=> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :=> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
```

, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))])\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] := -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rule 6688

Int[u\_, x\_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifyIntegrandQ[v, u, x]]

### Rule 6742

Int[u\_, x\_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]

### Rule 2411

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))])\*(b\_.)^(p\_.)\*((f\_.) + (g\_.)\*(x\_)^(q\_.)\*((h\_.) + (i\_.)\*(x\_)^(r\_.)), x\_Symbol] := Dist[1/e, Subst[Int[((g\*x)/e)^q\*((e\*h - d\*i)/e + (i\*x)/e)^r\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e\*f - d\*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2\*r]

### Rule 2344

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)])\*(b\_.)^(p\_.)/((d\_) + (e\_.)\*(x\_)), x\_Symbol] := Dist[1/d, Int[(a + b\*Log[c\*x^n])^p/x, x], x] - Dist[e/d, Int[(a + b\*Log[c\*x^n])^p/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

### Rule 2317

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)])\*(b\_.)^(p\_.)/((d\_) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^p)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b

, c, d, e, n}, x] && IGtQ[p, 0]

### Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s + 1))/(p*r*(s + 1)*(b*c
- a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q]^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
EqQ[p + q, 0] && NeQ[s, -1]
```

### Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q]^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

### Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))
^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

### Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /; !FalseQ[w] /; FreeQ[n, x]
```

### Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n])/(j + k
```

$*x), x] + \text{Int}[(\text{Log}[(c + d*x)^{(q*r)}]*(s + t*\text{Log}[i*(g + h*x)^n]))/(j + k*x), x] /;$  FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0]

### Rule 2433

$\text{Int}[(a + \text{Log}[(c + (d + (e*x)^n)]*(b))^p * ((f + \text{Log}[(h + (i + (j*x)^m)]*(g + (k + (l*x)^r)]), x\_Symbol] := \text{Dist}[1/e, \text{Subst}[\text{Int}[(k*x)/d]^r * (a + b*\text{Log}[c*x^n])^p * (f + g*\text{Log}[h*(e*i - d*j)/e + (j*x)/e]^m)], x], x, d + e*x], x] /;$  FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e\*k - d\*1, 0]

### Rule 2375

$\text{Int}[(\text{Log}[(d + (e + (f*x)^m)]^r)]*(a + \text{Log}[(c + (x)^n)]*(b))^p / (x), x\_Symbol] := \text{Simp}[(\text{Log}[d*(e + f*x^m)^r] * (a + b*\text{Log}[c*x^n])^{p+1}) / (b*n*(p+1)), x] - \text{Dist}[(f*m*r) / (b*n*(p+1)), \text{Int}[(x^{m-1} * (a + b*\text{Log}[c*x^n])^{p+1}) / (e + f*x^m), x], x] /;$  FreeQ[{a, b, c, d, e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d\*e, 1]

### Rule 2374

$\text{Int}[(\text{Log}[(d + (e + (f*x)^m)])]*(a + \text{Log}[(c + (x)^n)]*(b))^p / (x), x\_Symbol] := -\text{Simp}[(\text{PolyLog}[2, -(d*f*x^m)] * (a + b*\text{Log}[c*x^n])^p) / m, x] + \text{Dist}[(b*n*p) / m, \text{Int}[(\text{PolyLog}[2, -(d*f*x^m)] * (a + b*\text{Log}[c*x^n])^{p-1}) / x, x], x] /;$  FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0] && EqQ[d\*e, 1]

### Rule 6589

$\text{Int}[\text{PolyLog}[n, (c + (a + (b*x)^p)] / ((d + (e*x))), x\_Symbol] := \text{Simp}[\text{PolyLog}[n + 1, c*(a + b*x)^p] / (e*p), x] /;$  FreeQ[{a, b, c, d, e, n, p}, x] && EqQ[b\*d, a\*e]

### Rule 2440

$\text{Int}[(a + \text{Log}[(c + (d + (e*x)^n)]*(b)) * ((f + \text{Log}[(h + (i + (j*x)^m)]*(g + (k + (l*x)^r)]), x\_Symbol] := \text{Dist}[1/l, \text{Subst}[\text{Int}[x^r * (a + b*\text{Log}[c*(-((e*k - d*1)/l) + (e*x)/l)^n]) * (f + g*\text{Log}[h*(-((j*k - i*1)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /;$  FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]

### Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
]*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] := Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n]*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n])]/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m])]/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

### Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.)
]^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.)
) + (k_.)*(x_)), x_Symbol] := Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q]^r)/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

### Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.)
*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

### Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)]^(n_.)]*(b_.))^(p_)/(x_), x_Symbol] := Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
x]
```

### Rule 30

```
Int[(x_)^(m_.), x_Symbol] := Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

### Rubi steps



$$\begin{aligned}
\int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(191c + 191dx)(ag + bgx)^2} dx &= \int \left[ \frac{b\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc - ad)g^2(a + bx)^2} - \frac{bd\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc - ad)^2g^2(a + bx)} + \frac{d^2\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc - ad)^2g^2} \right] dx \\
&= -\frac{(bd) \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx} dx}{191(bc - ad)^2g^2} + \frac{d^2 \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx} dx}{191(bc - ad)^2g^2} + \frac{b \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(a+bx)^2} dx}{191(bc - ad)g^2} \\
&= -\frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc - ad)g^2(a + bx)} - \frac{d \log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc - ad)^2g^2} + \frac{d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc - ad)g^2} \\
&= -\frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc - ad)g^2(a + bx)} - \frac{d \log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc - ad)^2g^2} + \frac{d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc - ad)g^2} \\
&= -\frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc - ad)g^2(a + bx)} - \frac{d \log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc - ad)^2g^2} + \frac{d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc - ad)g^2} \\
&= -\frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc - ad)g^2(a + bx)} - \frac{d \log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc - ad)^2g^2} + \frac{d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc - ad)g^2} \\
&= -\frac{2Bn \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{191(bc - ad)g^2(a + bx)} - \frac{2Bdn \log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{191(bc - ad)^2g^2} - \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{191(bc - ad)g^2} \\
&= \frac{B^2d \log(a + bx) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{191(bc - ad)^2g^2} - \frac{2Bn \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{191(bc - ad)g^2(a + bx)} - \frac{2Bdn \log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{191(bc - ad)^2g^2} \\
&= \frac{B^2d \log\left(-\frac{bc-ad}{d(a+bx)}\right) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{191(bc - ad)^2g^2} + \frac{B^2d \log(a + bx) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{191(bc - ad)^2g^2} - \frac{2Bn \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{191(bc - ad)g^2(a + bx)} \\
&= -\frac{2B^2n^2}{191(bc - ad)g^2(a + bx)} - \frac{2B^2dn^2 \log(a + bx)}{191(bc - ad)^2g^2} + \frac{ABdn \log^2(a + bx)}{191(bc - ad)^2g^2} + \frac{B^2d \log\left(-\frac{bc-ad}{d(a+bx)}\right) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{191(bc - ad)^2g^2} \\
&= -\frac{2B^2n^2}{191(bc - ad)g^2(a + bx)} - \frac{2B^2dn^2 \log(a + bx)}{191(bc - ad)^2g^2} + \frac{ABdn \log^2(a + bx)}{191(bc - ad)^2g^2} + \frac{B^2dn^2 \log^2\left(-\frac{bc-ad}{d(a+bx)}\right)}{191(bc - ad)^2g^2}
\end{aligned}$$

**Mathematica [B]** time = 0.791503, size = 793, normalized size = 3.98

$$\frac{-2AB \left( \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) - n \log \left( \frac{a+bx}{c+dx} \right) \right) - B^2 \left( \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) - n \log \left( \frac{a+bx}{c+dx} \right) \right)^2 - 2B^2 n \left( \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) - n \log \left( \frac{a+bx}{c+dx} \right) \right) - A}{g^2 i(a+bx)(bc-ad)}$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2/((a\*g + b\*g\*x)^2\*(c\*i + d\*i\*x)),x]

[Out] 
$$\begin{aligned} & -(B^2 d^n \log^2 \left[ \frac{a+bx}{c+dx} \right] / (3(b^2 c - a^2 d) g^{2i} + (2B^n \log \left[ \frac{a+bx}{c+dx} \right] (A + B^n + B(\log \left[ \frac{a+bx}{c+dx} \right]^n - n \log \left[ \frac{a+bx}{c+dx} \right])) / ((-b^2 c) + a^2 d) g^{2i} (a+bx) + (\log \left[ \frac{a+bx}{c+dx} \right] / (c+dx))^2 ((-a^2 B d^n) - b^2 B^2 c^n - A b^2 B d^n x - b^2 B^2 d^n x - a^2 B^2 d^n (\log \left[ \frac{a+bx}{c+dx} \right]^n - n \log \left[ \frac{a+bx}{c+dx} \right]) - b^2 B^2 d^n x (\log \left[ \frac{a+bx}{c+dx} \right]^n - n \log \left[ \frac{a+bx}{c+dx} \right])))) / ((-b^2 c) + a^2 d)^2 g^{2i} (a+bx) + (-A^2 - 2A^2 B^n - 2B^2 n^2 - 2A^2 B (\log \left[ \frac{a+bx}{c+dx} \right]^n - n \log \left[ \frac{a+bx}{c+dx} \right]) - 2B^2 n (\log \left[ \frac{a+bx}{c+dx} \right]^n - n \log \left[ \frac{a+bx}{c+dx} \right]) - B^2 (\log \left[ \frac{a+bx}{c+dx} \right]^n - n \log \left[ \frac{a+bx}{c+dx} \right])^2) / ((b^2 c - a^2 d) g^{2i} (a+bx) - (d \log \left[ \frac{a+bx}{c+dx} \right] (A^2 + 2A^2 B^n + 2B^2 n^2 + 2A^2 B (\log \left[ \frac{a+bx}{c+dx} \right]^n - n \log \left[ \frac{a+bx}{c+dx} \right])) / (c+dx))^n - n \log \left[ \frac{a+bx}{c+dx} \right] + 2B^2 n (\log \left[ \frac{a+bx}{c+dx} \right]^n - n \log \left[ \frac{a+bx}{c+dx} \right])^2) / ((b^2 c - a^2 d) g^{2i} + (d(A^2 + 2A^2 B^n + 2B^2 n^2 + 2A^2 B (\log \left[ \frac{a+bx}{c+dx} \right]^n - n \log \left[ \frac{a+bx}{c+dx} \right])) / (c+dx)) + 2B^2 n (\log \left[ \frac{a+bx}{c+dx} \right]^n - n \log \left[ \frac{a+bx}{c+dx} \right]) / (c+dx)) + B^2 (\log \left[ \frac{a+bx}{c+dx} \right]^n - n \log \left[ \frac{a+bx}{c+dx} \right])^2) \log \left[ \frac{a+bx}{c+dx} \right] / ((b^2 c - a^2 d) g^{2i} \end{aligned}$$

**Maple [F]** time = 0.701, size = 0, normalized size = 0.

$$\int \frac{1}{(bgx + ag)^2 (dix + ci)} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^2/(d\*i\*x+c\*i),x)

[Out] int((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^2/(d\*i\*x+c\*i),x)

**Maxima [B]** time = 1.54812, size = 1374, normalized size = 6.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^2/(d\*i\*x+c\*i),x, algorithm="maxima")

[Out] 
$$-B^2*(1/((b^2*c - a*b*d)*g^{2*i}*x + (a*b*c - a^2*d)*g^{2*i}) + d*\log(b*x + a)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g^{2*i}) - d*\log(d*x + c)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g^{2*i}))*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n)^2 - 2*A*B*(1/((b^2*c - a*b*d)*g^{2*i}*x + (a*b*c - a^2*d)*g^{2*i}) + d*\log(b*x + a)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g^{2*i}) - d*\log(d*x + c)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g^{2*i}))*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) - 1/3*((b*d*x + a*d)*\log(b*x + a)^3 - (b*d*x + a*d)*\log(d*x + c)^3 - 3*(b*d*x + a*d)*\log(b*x + a)^2 - 3*(b*d*x + a*d - (b*d*x + a*d)*\log(b*x + a))*\log(d*x + c)^2 + 6*b*c - 6*a*d + 6*(b*d*x + a*d)*\log(b*x + a) - 3*(2*b*d*x + (b*d*x + a*d)*\log(b*x + a))^2 + 2*a*d - 2*(b*d*x + a*d)*\log(b*x + a))*\log(d*x + c))*n^2/(a*b^2*c^2*g^{2*i} - 2*a^2*b*c*d*g^{2*i} + a^3*d^2*g^{2*i} + (b^3*c^2*g^{2*i} - 2*a*b^2*c*d*g^{2*i} + a^2*b*d^2*g^{2*i})*x) - 3*((b*d*x + a*d)*\log(b*x + a)^2 + (b*d*x + a*d)*\log(d*x + c)^2 - 2*b*c + 2*a*d - 2*(b*d*x + a*d)*\log(b*x + a) + 2*(b*d*x + a*d - (b*d*x + a*d)*\log(b*x + a))*\log(d*x + c))*n*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(a*b^2*c^2*g^{2*i} - 2*a^2*b*c*d*g^{2*i} + a^3*d^2*g^{2*i} + (b^3*c^2*g^{2*i} - 2*a*b^2*c*d*g^{2*i} + a^2*b*d^2*g^{2*i})*x))*B^2 + ((b*d*x + a*d)*\log(b*x + a)^2 + (b*d*x + a*d)*\log(d*x + c)^2 - 2*b*c + 2*a*d - 2*(b*d*x + a*d)*\log(b*x + a) + 2*(b*d*x + a*d - (b*d*x + a*d)*\log(b*x + a))*\log(d*x + c))*A*B*n/(a*b^2*c^2*g^{2*i} - 2*a^2*b*c*d*g^{2*i} + a^3*d^2*g^{2*i} + (b^3*c^2*g^{2*i} - 2*a*b^2*c*d*g^{2*i} + a^2*b*d^2*g^{2*i})*x) - A^2*(1/((b^2*c - a*b*d)*g^{2*i}*x + (a*b*c - a^2*d)*g^{2*i}) + d*\log(b*x + a)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g^{2*i}) - d*\log(d*x + c)/((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*g^{2*i}))$$

**Fricas [B]** time = 0.540508, size = 956, normalized size = 4.8

$$3 A^2 b c - 3 A^2 a d + (B^2 b d n^2 x + B^2 a d n^2) \log\left(\frac{b x + a}{d x + c}\right)^3 + 6 (B^2 b c - B^2 a d) n^2 + 3 (B^2 b c - B^2 a d + (B^2 b d x + B^2 a d) \log\left(\frac{b x + a}{d x + c}\right))$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i),x, a
lgorithm="fricas")
```

```
[Out] -1/3*(3*A^2*b*c - 3*A^2*a*d + (B^2*b*d*n^2*x + B^2*a*d*n^2)*log((b*x + a)/(
d*x + c)))^3 + 6*(B^2*b*c - B^2*a*d)*n^2 + 3*(B^2*b*c - B^2*a*d + (B^2*b*d*x
+ B^2*a*d)*log((b*x + a)/(d*x + c)))*log(e)^2 + 3*(B^2*b*c*n^2 + A*B*a*d*n
+ (B^2*b*d*n^2 + A*B*b*d*n)*x)*log((b*x + a)/(d*x + c))^2 + 6*(A*B*b*c - A
*B*a*d)*n + 3*(2*A*B*b*c - 2*A*B*a*d + (B^2*b*d*n*x + B^2*a*d*n)*log((b*x +
a)/(d*x + c))^2 + 2*(B^2*b*c - B^2*a*d)*n + 2*(B^2*b*c*n + A*B*a*d + (B^2*
b*d*n + A*B*b*d)*x)*log((b*x + a)/(d*x + c)))*log(e) + 3*(2*B^2*b*c*n^2 + 2
*A*B*b*c*n + A^2*a*d + (2*B^2*b*d*n^2 + 2*A*B*b*d*n + A^2*b*d)*x)*log((b*x
+ a)/(d*x + c)))/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^2*i*x + (a*b^2*c^2
- 2*a^2*b*c*d + a^3*d^2)*g^2*i)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}{(bgx + ag)^2(dx + ci)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i),x, a
lgorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/((b*g*x + a*g)^2*(d*i*x
+ c*i)), x)
```

$$3.192 \quad \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^3(ci+dix)} dx$$

**Optimal.** Leaf size=369

$$\frac{b^2(c+dx)^2 \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)^2}{2g^3i(a+bx)^2(bc-ad)^3} - \frac{b^2Bn(c+dx)^2 \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{2g^3i(a+bx)^2(bc-ad)^3} + \frac{d^2 \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)^3}{3Bg^3in(bc-ad)^3} + \frac{2bd(c+dx)^2 \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{2g^3i(a+bx)^2(bc-ad)^3}$$

[Out]  $(4*b*B^2*d*n^2*(c+dx))/((b*c-a*d)^3*g^3*i*(a+bx)) - (b^2*B^2*n^2*(c+dx)^2)/(4*(b*c-a*d)^3*g^3*i*(a+bx)^2) + (4*b*B*d*n*(c+dx)*(A+B*\text{Log}[e*((a+bx)/(c+dx))^n]))/((b*c-a*d)^3*g^3*i*(a+bx)) - (b^2*B*n*(c+dx)^2*(A+B*\text{Log}[e*((a+bx)/(c+dx))^n]))/(2*(b*c-a*d)^3*g^3*i*(a+bx)^2) + (2*b*d*(c+dx)*(A+B*\text{Log}[e*((a+bx)/(c+dx))^n]))^2/((b*c-a*d)^3*g^3*i*(a+bx)) - (b^2*(c+dx)^2*(A+B*\text{Log}[e*((a+bx)/(c+dx))^n]))^2/(2*(b*c-a*d)^3*g^3*i*(a+bx)^2) + (d^2*(A+B*\text{Log}[e*((a+bx)/(c+dx))^n]))^3/(3*B*(b*c-a*d)^3*g^3*i*n)$

**Rubi [C]** time = 7.19728, antiderivative size = 2025, normalized size of antiderivative = 5.49, number of steps used = 111, number of rules used = 31, integrand size = 45,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.689$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

[In]  $\text{Int}[(A + B*\text{Log}[e*((a+bx)/(c+dx))^n])^2/((a*g + b*g*x)^3*(c*i + d*i*x)), x]$

[Out]  $-(B^2*n^2)/(4*(b*c-a*d)*g^3*i*(a+bx)^2) + (7*B^2*d*n^2)/(2*(b*c-a*d)^2*g^3*i*(a+bx)) + (7*B^2*d^2*n^2*\text{Log}[a+bx])/((b*c-a*d)^3*g^3*i) - (A*B*d^2*n*\text{Log}[a+bx]^2)/((b*c-a*d)^3*g^3*i) - (3*B^2*d^2*n^2*\text{Log}[a+bx]^2)/(2*(b*c-a*d)^3*g^3*i) - (B^2*d^2*\text{Log}[-((b*c-a*d)/(d*(a+bx))])* \text{Log}[e*((a+bx)/(c+dx))^n]^2)/((b*c-a*d)^3*g^3*i) - (B^2*d^2*\text{Log}[a+bx]* \text{Log}[e*((a+bx)/(c+dx))^n]^2)/((b*c-a*d)^3*g^3*i) - (B*n*(A+B*\text{Log}[e*((a+bx)/(c+dx))^n]))/(2*(b*c-a*d)*g^3*i*(a+bx)^2) + (3*B*d*n*(A+B*\text{Log}[e*((a+bx)/(c+dx))^n]))/((b*c-a*d)^2*g^3*i*(a+bx)) + (3*B*d^2*n*\text{Log}[a+bx]*(A+B*\text{Log}[e*((a+bx)/(c+dx))^n]))/((b*c-a*d)^3*g^3*i)$

$$\begin{aligned}
& - a*d)^3*g^3*i) - (A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2/(2*(b*c - a*d)*g^3*i*(a + b*x)^2) + (d*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^2*g^3*i*(a + b*x)) + (d^2*\text{Log}[a + b*x]*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^3*g^3*i) - (7*B^2*d^2*n^2*\text{Log}[c + d*x])/(2*(b*c - a*d)^3*g^3*i) + (2*A*B*d^2*n*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/((b*c - a*d)^3*g^3*i) + (3*B^2*d^2*n^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/((b*c - a*d)^3*g^3*i) + (B^2*d^2*\text{Log}[(a + b*x)^n]^2*\text{Log}[c + d*x])/((b*c - a*d)^3*g^3*i) - (3*B*d^2*n*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])*\text{Log}[c + d*x])/((b*c - a*d)^3*g^3*i) - (d^2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2*\text{Log}[c + d*x])/((b*c - a*d)^3*g^3*i) - (A*B*d^2*n*\text{Log}[c + d*x]^2)/((b*c - a*d)^3*g^3*i) - (3*B^2*d^2*n^2*\text{Log}[c + d*x]^2)/(2*(b*c - a*d)^3*g^3*i) + (B^2*d^2*n^2*\text{Log}[a + b*x]*\text{Log}[c + d*x]^2)/((b*c - a*d)^3*g^3*i) - (B^2*d^2*n*\text{Log}[e*((a + b*x)/(c + d*x))^n]*\text{Log}[c + d*x]^2)/((b*c - a*d)^3*g^3*i) - (B^2*d^2*n^2*\text{Log}[c + d*x]^3)/(3*(b*c - a*d)^3*g^3*i) + (2*A*B*d^2*n*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)]/((b*c - a*d)^3*g^3*i) + (3*B^2*d^2*n^2*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)]/((b*c - a*d)^3*g^3*i) - (B^2*d^2*\text{Log}[(a + b*x)^n]^2*\text{Log}[(b*(c + d*x))/(b*c - a*d)]/((b*c - a*d)^3*g^3*i) + (2*B^2*d^2*n*\text{Log}[a + b*x]*\text{Log}[c + d*x]*\text{Log}[(c + d*x)^(-n)]/((b*c - a*d)^3*g^3*i) + (B^2*d^2*\text{Log}[a + b*x]*\text{Log}[(c + d*x)^(-n)]^2)/((b*c - a*d)^3*g^3*i) - (B^2*d^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[(c + d*x)^(-n)]^2)/((b*c - a*d)^3*g^3*i) - (2*B^2*d^2*n*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x]*(\text{Log}[(a + b*x)^n] - \text{Log}[e*((a + b*x)/(c + d*x))^n] + \text{Log}[(c + d*x)^(-n)]))/((b*c - a*d)^3*g^3*i) + (2*A*B*d^2*n*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]/((b*c - a*d)^3*g^3*i) + (3*B^2*d^2*n^2*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]/((b*c - a*d)^3*g^3*i) - (2*B^2*d^2*n*\text{Log}[(a + b*x)^n]*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]/((b*c - a*d)^3*g^3*i) + (2*A*B*d^2*n*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]/((b*c - a*d)^3*g^3*i) + (3*B^2*d^2*n^2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]/((b*c - a*d)^3*g^3*i) + (2*B^2*d^2*n*\text{Log}[(c + d*x)^(-n)]*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]/((b*c - a*d)^3*g^3*i) - (2*B^2*d^2*n*(\text{Log}[(a + b*x)^n] - \text{Log}[e*((a + b*x)/(c + d*x))^n] + \text{Log}[(c + d*x)^(-n)])*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]/((b*c - a*d)^3*g^3*i) + (2*B^2*d^2*n*\text{Log}[e*((a + b*x)/(c + d*x))^n]*\text{PolyLog}[2, 1 + (b*c - a*d)/(d*(a + b*x))]/((b*c - a*d)^3*g^3*i) + (2*B^2*d^2*n^2*\text{PolyLog}[3, -((d*(a + b*x))/(b*c - a*d))]/((b*c - a*d)^3*g^3*i) + (2*B^2*d^2*n^2*\text{PolyLog}[3, (b*(c + d*x))/(b*c - a*d)]/((b*c - a*d)^3*g^3*i) + (2*B^2*d^2*n^2*\text{PolyLog}[3, 1 + (b*c - a*d)/(d*(a + b*x))]/((b*c - a*d)^3*g^3*i)
\end{aligned}$$

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_.))^(m_.)*((c_.) + (d_.)*(x_.))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_.)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFX^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_.))^(n_.)]*(b_.))^(p_.)*(RFX_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFX, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFX, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_.))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)*(x_.))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_.)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
```

$g[c*x^n]^2/(2*b*n), x] /; \text{FreeQ}\{a, b, c, n\}, x]$

### Rule 2394

$\text{Int}[(a_.) + \text{Log}[(c_.)*((d_.) + (e_.)*(x_.))^{(n_.)}]*(b_.)]/((f_.) + (g_.)*(x_.)), x\_Symbol] \rightarrow \text{Simp}[(\text{Log}[(e*(f + g*x))/(e*f - d*g)]*(a + b*\text{Log}[c*(d + e*x)^n]))/g, x] - \text{Dist}[(b*e*n)/g, \text{Int}[\text{Log}[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, n\}, x] \&\& \text{NeQ}[e*f - d*g, 0]$

### Rule 2393

$\text{Int}[(a_.) + \text{Log}[(c_.)*((d_.) + (e_.)*(x_.))]*(b_.)]/((f_.) + (g_.)*(x_.)), x\_Symbol] \rightarrow \text{Dist}[1/g, \text{Subst}[\text{Int}[(a + b*\text{Log}[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g\}, x] \&\& \text{NeQ}[e*f - d*g, 0] \&\& \text{EqQ}[g + c*(e*f - d*g), 0]$

### Rule 2391

$\text{Int}[\text{Log}[(c_.)*((d_.) + (e_.)*(x_.))^{(n_.)}]]/(x_), x\_Symbol] \rightarrow -\text{Simp}[\text{PolyLog}[2, -(c*e*x^n)]/n, x] /; \text{FreeQ}\{c, d, e, n\}, x] \&\& \text{EqQ}[c*d, 1]$

### Rule 6688

$\text{Int}[u_, x\_Symbol] \rightarrow \text{With}\{v = \text{SimplifyIntegrand}[u, x]\}, \text{Int}[v, x] /; \text{SimplerIntegrandQ}[v, u, x]$

### Rule 6742

$\text{Int}[u_, x\_Symbol] \rightarrow \text{With}\{v = \text{ExpandIntegrand}[u, x]\}, \text{Int}[v, x] /; \text{SumQ}[v]$

### Rule 2411

$\text{Int}[(a_.) + \text{Log}[(c_.)*((d_.) + (e_.)*(x_.))^{(n_.)}]*(b_.))^{(p_.)}*((f_.) + (g_.)*(x_.))^{(q_.)}*((h_.) + (i_.)*(x_.))^{(r_.)}, x\_Symbol] \rightarrow \text{Dist}[1/e, \text{Subst}[\text{Int}[(g*x)/e]^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*\text{Log}[c*x^n])^p, x], x, d + e*x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h, i, n, p, q, r\}, x] \&\& \text{EqQ}[e*f - d*g, 0] \&\& (\text{IGtQ}[p, 0] \|\| \text{IGtQ}[r, 0]) \&\& \text{IntegerQ}[2*r]$

### Rule 2344

$\text{Int}[(a_.) + \text{Log}[(c_.)*(x_.)^{(n_.)}]*(b_.))^{(p_.)}/((x_.)*((d_.) + (e_.)*(x_.))), x\_Symbol] \rightarrow \text{Dist}[1/d, \text{Int}[(a + b*\text{Log}[c*x^n])^p/x, x], x] - \text{Dist}[e/d, \text{Int}[(a + b*\text{Log}[c*x^n])^p/(d + e*x), x], x] /; \text{FreeQ}\{a, b, c, d, e, n\}, x] \&\& I$



GtQ[p, 0]

### Rule 2317

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^p)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

### Rule 2507

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.)\*Log[(i\_.)\*((j\_.)\*((g\_.) + (h\_.)\*(x\_))^(t\_.))^(u\_.)]\*(v\_), x\_Symbol] := With[{k = Simplify[v\*(a + b\*x)\*(c + d\*x)]}, Simp[(k\*Log[i\*(j\*(g + h\*x)^t]^u)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s + 1))/(p\*r\*(s + 1)\*(b\*c - a\*d)), x] - Dist[(k\*h\*t\*u)/(p\*r\*(s + 1)\*(b\*c - a\*d)), Int[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s + 1)/(g + h\*x), x], x] /; FreeQ[k, x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && NeQ[s, -1]

### Rule 2488

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.)/((g\_.) + (h\_.)\*(x\_)), x\_Symbol] := -Simp[(Log[-(b\*c - a\*d)/(d\*(a + b\*x))]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/h, x] + Dist[(p\*r\*s\*(b\*c - a\*d)/h, Int[(Log[-(b\*c - a\*d)/(d\*(a + b\*x))]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1))/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && EqQ[b\*g - a\*h, 0] && IGtQ[s, 0]

### Rule 2506

Int[Log[v\_]\*Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.)\*(u\_), x\_Symbol] := With[{g = Simplify[((v - 1)\*(c + d\*x))/(a + b\*x)], h = Simplify[u\*(a + b\*x)\*(c + d\*x)]}, -Simp[(h\*PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/(b\*c - a\*d), x] + Dist[h\*p\*r\*s, Int[(PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1))/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]

### Rule 6610

Int[(u\_)\*PolyLog[n\_, v\_], x\_Symbol] := With[{w = DerivativeDivides[v, u\*v, x]}, Simp[w\*PolyLog[n + 1, v], x] /; !FalseQ[w]] /; FreeQ[n, x]

Rule 2500

```
Int[(Log[(e_.)*((f_.)*(a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))/((j_.) + (k
_.)*(x_)), x_Symbol] := Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] := Dist[1/e, Subst[Int[(k*x)/d]^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
e*i - d*j)/e + (j*x)/e]^m), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_))^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_))^(n_
.))*((b_.))^(p_.))/(x_), x_Symbol] := Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_))^(m_.))]*((a_.) + Log[(c_.)*(x_))^(n_.))*
((b_.))^(p_.))/(x_), x_Symbol] := -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Symbol] :=
```

Dist[1/l, Subst[Int[x^r\*(a + b\*Log[c\*(-((e\*k - d\*l)/l) + (e\*x)/l)^n])\*(f + g\*Log[h\*(-((j\*k - i\*l)/l) + (j\*x)/l)^m]), x], x, k + l\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]

### Rule 2434

Int[(((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))\*((f\_.) + Log[(h\_.)\*(i\_.) + (j\_.)\*(x\_)]^(m\_.)]\*(g\_.))/(x\_), x\_Symbol] :> Simp[Log[x]\*(a + b\*Log[c\*(d + e\*x)^n])\*(f + g\*Log[h\*(i + j\*x)^m]), x] + (-Dist[e\*g\*m, Int[(Log[x]\*(a + b\*Log[c\*(d + e\*x)^n]))/(d + e\*x), x], x] - Dist[b\*j\*n, Int[(Log[x]\*(f + g\*Log[h\*(i + j\*x)^m))]/(i + j\*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, m, n}, x] && EqQ[e\*i - d\*j, 0]

### Rule 2499

Int[(Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.))]^(r\_.)]\*(s\_.) + Log[(i\_.)\*((g\_.) + (h\_.)\*(x\_))^(n\_.)]\*(t\_.)]^(m\_.))/(j\_.) + (k\_.)\*(x\_)), x\_Symbol] :> Simp[((s + t\*Log[i\*(g + h\*x)^n])^(m + 1)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r)/(k\*n\*t\*(m + 1)), x] + (-Dist[(b\*p\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(a + b\*x), x], x] - Dist[(d\*q\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(c + d\*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0] && EqQ[h\*j - g\*k, 0] && IGtQ[m, 0]

### Rule 2396

Int[(((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))]^(p\_)/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :> Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])^p)/g, x] - Dist[(b\*e\*n\*p)/g, Int[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])^(p - 1))/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p}, x] && NeQ[e\*f - d\*g, 0] && IGtQ[p, 1]

### Rule 2302

Int[(((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))]^(p\_)/(x\_), x\_Symbol] :> Dist[1/(b\*n), Subst[Int[x^p, x], x, a + b\*Log[c\*x^n]], x] /; FreeQ[{a, b, c, n, p}, x]

### Rule 30

Int[(x\_)^(m\_.), x\_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && NeQ[m, -1]

### Rubi steps

$$\begin{aligned}
\int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(192c + 192dx)(ag + bgx)^3} dx &= \int \left[ \frac{b\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{192(bc - ad)g^3(a + bx)^3} - \frac{bd\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{192(bc - ad)^2g^3(a + bx)^2} + \frac{bd^2\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{192(bc - ad)^3g^3(a + bx)} \right] dx \\
&= \frac{(bd^2) \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx} dx}{192(bc - ad)^3g^3} - \frac{d^3 \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx} dx}{192(bc - ad)^3g^3} - \frac{(bd) \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(a+bx)^2} dx}{192(bc - ad)^2g^3} \\
&= -\frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{384(bc - ad)g^3(a + bx)^2} + \frac{d\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{192(bc - ad)^2g^3(a + bx)} + \frac{d^2 \log(a + bx)\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{192(bc - ad)^3g^3} \\
&= -\frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{384(bc - ad)g^3(a + bx)^2} + \frac{d\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{192(bc - ad)^2g^3(a + bx)} + \frac{d^2 \log(a + bx)\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{192(bc - ad)^3g^3} \\
&= -\frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{384(bc - ad)g^3(a + bx)^2} + \frac{d\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{192(bc - ad)^2g^3(a + bx)} + \frac{d^2 \log(a + bx)\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{192(bc - ad)^3g^3} \\
&= -\frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{384(bc - ad)g^3(a + bx)^2} + \frac{d\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{192(bc - ad)^2g^3(a + bx)} + \frac{d^2 \log(a + bx)\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{192(bc - ad)^3g^3} \\
&= -\frac{Bn\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{384(bc - ad)g^3(a + bx)^2} + \frac{Bdn\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{64(bc - ad)^2g^3(a + bx)} + \frac{Bd^2n \log(a + bx)\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{64(bc - ad)^3g^3} \\
&= -\frac{B^2d^2 \log(a + bx) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{192(bc - ad)^3g^3} - \frac{Bn\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{384(bc - ad)g^3(a + bx)^2} + \frac{Bdn\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{64(bc - ad)^2g^3} \\
&= -\frac{B^2d^2 \log\left(-\frac{bc-ad}{d(a+bx)}\right) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{192(bc - ad)^3g^3} - \frac{B^2d^2 \log(a + bx) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{192(bc - ad)^3g^3} - \frac{Bn\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{384(bc - ad)^2g^3} \\
&= -\frac{B^2n^2}{768(bc - ad)g^3(a + bx)^2} + \frac{7B^2dn^2}{384(bc - ad)^2g^3(a + bx)} + \frac{7B^2d^2n^2 \log(a + bx)}{384(bc - ad)^3g^3} - \frac{ABd^2n}{192(bc - ad)^2g^3} \\
&= -\frac{B^2n^2}{768(bc - ad)g^3(a + bx)^2} + \frac{7B^2dn^2}{384(bc - ad)^2g^3(a + bx)} + \frac{7B^2d^2n^2 \log(a + bx)}{384(bc - ad)^3g^3} - \frac{ABd^2n}{192(bc - ad)^2g^3}
\end{aligned}$$

**Mathematica [B]** time = 1.42505, size = 975, normalized size = 2.64

$$4B^2d^2n^2(a+bx)^2 \log^3\left(\frac{a+bx}{c+dx}\right) + 6Bn \left( 2Ad^2x^2b^2 + 3Bd^2nx^2b^2 - Bc^2nb^2 + 2Bcdnxb^2 + 4aBcdnb + 4aAd^2xb + 4aBd^2nxb \right)$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2/((a\*g + b\*g\*x)^3\*(c\*i + d\*i\*x)), x]

[Out]  $(4*B^2*d^2*n^2*(a + b*x)^2*\text{Log}[(a + b*x)/(c + d*x)]^3 + 6*B*n*\text{Log}[(a + b*x)/(c + d*x)]^2*(2*a^2*A*d^2 - b^2*B*c^2*n + 4*a*b*B*c*d*n + 4*a*A*b*d^2*x + 2*b^2*B*c*d*n*x + 4*a*b*B*d^2*n*x + 2*A*b^2*d^2*x^2 + 3*b^2*B*d^2*n*x^2 + 2*B*d^2*(a + b*x)^2*\text{Log}[e*((a + b*x)/(c + d*x))^n] - 2*B*d^2*n*(a + b*x)^2*\text{Log}[(a + b*x)/(c + d*x)]) - 6*B*(b*c - a*d)*n*\text{Log}[(a + b*x)/(c + d*x)]*(2*A*b*c - 6*a*A*d + b*B*c*n - 7*a*B*d*n - 4*A*b*d*x - 6*b*B*d*n*x + 2*B*(-3*a*d + b*(c - 2*d*x))*\text{Log}[e*((a + b*x)/(c + d*x))^n] + 2*B*n*(-(b*c) + 3*a*d + 2*b*d*x)*\text{Log}[(a + b*x)/(c + d*x)]) - 3*(b*c - a*d)^2*(2*A^2 + 2*A*B*n + B^2*n^2 + 2*B^2*\text{Log}[e*((a + b*x)/(c + d*x))^n]^2 - 2*B*n*(2*A + B*n)*\text{Log}[(a + b*x)/(c + d*x)] + 2*B^2*n^2*\text{Log}[(a + b*x)/(c + d*x)]^2 + 2*B*\text{Log}[e*((a + b*x)/(c + d*x))^n]*(2*A + B*n - 2*B*n*\text{Log}[(a + b*x)/(c + d*x)])) + 6*d*(b*c - a*d)*(a + b*x)*(2*A^2 + 6*A*B*n + 7*B^2*n^2 + 2*B^2*\text{Log}[e*((a + b*x)/(c + d*x))^n]^2 - 2*B*n*(2*A + 3*B*n)*\text{Log}[(a + b*x)/(c + d*x)] + 2*B^2*n^2*\text{Log}[(a + b*x)/(c + d*x)]^2 + 2*B*\text{Log}[e*((a + b*x)/(c + d*x))^n]*(2*A + 3*B*n - 2*B*n*\text{Log}[(a + b*x)/(c + d*x)])) + 6*d^2*(a + b*x)^2*\text{Log}[a + b*x]*(2*A^2 + 6*A*B*n + 7*B^2*n^2 + 2*B^2*\text{Log}[e*((a + b*x)/(c + d*x))^n]^2 - 2*B*n*(2*A + 3*B*n)*\text{Log}[(a + b*x)/(c + d*x)] + 2*B^2*n^2*\text{Log}[(a + b*x)/(c + d*x)]^2 + 2*B*\text{Log}[e*((a + b*x)/(c + d*x))^n]*(2*A + 3*B*n - 2*B*n*\text{Log}[(a + b*x)/(c + d*x)])) - 6*d^2*(a + b*x)^2*(2*A^2 + 6*A*B*n + 7*B^2*n^2 + 2*B^2*\text{Log}[e*((a + b*x)/(c + d*x))^n]^2 - 2*B*n*(2*A + 3*B*n)*\text{Log}[(a + b*x)/(c + d*x)] + 2*B^2*n^2*\text{Log}[(a + b*x)/(c + d*x)]^2 + 2*B*\text{Log}[e*((a + b*x)/(c + d*x))^n]*(2*A + 3*B*n - 2*B*n*\text{Log}[(a + b*x)/(c + d*x)]))*\text{Log}[c + d*x]/(12*(b*c - a*d)^3*g^3*i*(a + b*x)^2)$

**Maple [F]** time = 0.701, size = 0, normalized size = 0.

$$\int \frac{1}{(bgx + ag)^3 (dix + ci)} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i),x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i),x)
```

**Maxima [B]** time = 1.96391, size = 2870, normalized size = 7.78

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i),x, a
lgorithm="maxima")
```

```
[Out] 1/2*B^2*((2*b*d*x - b*c + 3*a*d)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3
*i*x^2 + 2*(a*b^3*c^2 - 2*a^2*b^2*c*d + a^3*b*d^2)*g^3*i*x + (a^2*b^2*c^2 -
2*a^3*b*c*d + a^4*d^2)*g^3*i) + 2*d^2*log(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2
*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i) - 2*d^2*log(d*x + c)/((b^3*c^3 - 3*a*b
^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i))*log(e*(b*x/(d*x + c) + a/(d*x +
c))^n)^2 + A*B*((2*b*d*x - b*c + 3*a*d)/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*
d^2)*g^3*i*x^2 + 2*(a*b^3*c^2 - 2*a^2*b^2*c*d + a^3*b*d^2)*g^3*i*x + (a^2*b
^2*c^2 - 2*a^3*b*c*d + a^4*d^2)*g^3*i) + 2*d^2*log(b*x + a)/((b^3*c^3 - 3*a
*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i) - 2*d^2*log(d*x + c)/((b^3*c^3
- 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i))*log(e*(b*x/(d*x + c) +
a/(d*x + c))^n) - 1/12*((3*b^2*c^2 - 48*a*b*c*d + 45*a^2*d^2 - 4*(b^2*d^2*x
^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a)^3 + 4*(b^2*d^2*x^2 + 2*a*b*d^2*x +
a^2*d^2)*log(d*x + c)^3 + 18*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x
+ a)^2 + 6*(3*b^2*d^2*x^2 + 6*a*b*d^2*x + 3*a^2*d^2 - 2*(b^2*d^2*x^2 + 2*a
*b*d^2*x + a^2*d^2)*log(b*x + a))*log(d*x + c)^2 - 42*(b^2*c*d - a*b*d^2)*x
- 42*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a) + 6*(7*b^2*d^2*x^2
+ 14*a*b*d^2*x + 7*a^2*d^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b
*x + a)^2 - 6*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a))*log(d*x +
c))*n^2/(a^2*b^3*c^3*g^3*i - 3*a^3*b^2*c^2*d*g^3*i + 3*a^4*b*c*d^2*g^3*i -
a^5*d^3*g^3*i + (b^5*c^3*g^3*i - 3*a*b^4*c^2*d*g^3*i + 3*a^2*b^3*c*d^2*g^3
*i - a^3*b^2*d^3*g^3*i)*x^2 + 2*(a*b^4*c^3*g^3*i - 3*a^2*b^3*c^2*d*g^3*i +
3*a^3*b^2*c*d^2*g^3*i - a^4*b*d^3*g^3*i)*x) + 6*(b^2*c^2 - 8*a*b*c*d + 7*a^
2*d^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a)^2 + 2*(b^2*d^2
*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(d*x + c)^2 - 6*(b^2*c*d - a*b*d^2)*x - 6*
(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a) + 2*(3*b^2*d^2*x^2 + 6*a
*b*d^2*x + 3*a^2*d^2 - 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a)
)*log(d*x + c))*n*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(a^2*b^3*c^3*g^3*i
- 3*a^3*b^2*c^2*d*g^3*i + 3*a^4*b*c*d^2*g^3*i - a^5*d^3*g^3*i + (b^5*c^3*g
^3*i - 3*a*b^4*c^2*d*g^3*i + 3*a^2*b^3*c*d^2*g^3*i - a^3*b^2*d^3*g^3*i)*x^2
```

$$\begin{aligned}
& + 2*(a*b^4*c^3*g^3*i - 3*a^2*b^3*c^2*d*g^3*i + 3*a^3*b^2*c*d^2*g^3*i - a^4 \\
& *b*d^3*g^3*i)*x)) * B^2 - 1/2*(b^2*c^2 - 8*a*b*c*d + 7*a^2*d^2 + 2*(b^2*d^2*x \\
& ^2 + 2*a*b*d^2*x + a^2*d^2)*\log(b*x + a)^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + \\
& a^2*d^2)*\log(d*x + c)^2 - 6*(b^2*c*d - a*b*d^2)*x - 6*(b^2*d^2*x^2 + 2*a*b \\
& *d^2*x + a^2*d^2)*\log(b*x + a) + 2*(3*b^2*d^2*x^2 + 6*a*b*d^2*x + 3*a^2*d^2 \\
& - 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*\log(b*x + a))*\log(d*x + c))*A*B* \\
& n/(a^2*b^3*c^3*g^3*i - 3*a^3*b^2*c^2*d*g^3*i + 3*a^4*b*c*d^2*g^3*i - a^5*d^ \\
& 3*g^3*i + (b^5*c^3*g^3*i - 3*a*b^4*c^2*d*g^3*i + 3*a^2*b^3*c*d^2*g^3*i - a^ \\
& 3*b^2*d^3*g^3*i)*x^2 + 2*(a*b^4*c^3*g^3*i - 3*a^2*b^3*c^2*d*g^3*i + 3*a^3*b \\
& ^2*c*d^2*g^3*i - a^4*b*d^3*g^3*i)*x) + 1/2*A^2*((2*b*d*x - b*c + 3*a*d)/((b \\
& ^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*g^3*i*x^2 + 2*(a*b^3*c^2 - 2*a^2*b^2*c* \\
& d + a^3*b*d^2)*g^3*i*x + (a^2*b^2*c^2 - 2*a^3*b*c*d + a^4*d^2)*g^3*i) + 2*d \\
& ^2*\log(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^3*i) \\
& - 2*d^2*\log(d*x + c)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)* \\
& g^3*i))
\end{aligned}$$

**Fricas [B]** time = 0.580213, size = 2229, normalized size = 6.04

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^3/(d\*i\*x+c\*i),x, a  
lgorithm="fricas")

[Out] 
$$\begin{aligned}
& -1/12*(6*A^2*b^2*c^2 - 24*A^2*a*b*c*d + 18*A^2*a^2*d^2 - 4*(B^2*b^2*d^2*n^2 \\
& *x^2 + 2*B^2*a*b*d^2*n^2*x + B^2*a^2*d^2*n^2)*\log((b*x + a)/(d*x + c))^3 + \\
& 3*(B^2*b^2*c^2 - 16*B^2*a*b*c*d + 15*B^2*a^2*d^2)*n^2 + 6*(B^2*b^2*c^2 - 4* \\
& B^2*a*b*c*d + 3*B^2*a^2*d^2 - 2*(B^2*b^2*c*d - B^2*a*b*d^2)*x - 2*(B^2*b^2* \\
& d^2*x^2 + 2*B^2*a*b*d^2*x + B^2*a^2*d^2)*\log((b*x + a)/(d*x + c))*\log(e)^2 \\
& - 6*(2*A*B*a^2*d^2*n - (B^2*b^2*c^2 - 4*B^2*a*b*c*d)*n^2 + (3*B^2*b^2*d^2* \\
& n^2 + 2*A*B*b^2*d^2*n)*x^2 + 2*(2*A*B*a*b*d^2*n + (B^2*b^2*c*d + 2*B^2*a*b* \\
& d^2)*n^2)*x)*\log((b*x + a)/(d*x + c))^2 + 6*(A*B*b^2*c^2 - 8*A*B*a*b*c*d + \\
& 7*A*B*a^2*d^2)*n - 6*(2*A^2*b^2*c*d - 2*A^2*a*b*d^2 + 7*(B^2*b^2*c*d - B^2* \\
& a*b*d^2)*n^2 + 6*(A*B*b^2*c*d - A*B*a*b*d^2)*n)*x + 6*(2*A*B*b^2*c^2 - 8*A* \\
& B*a*b*c*d + 6*A*B*a^2*d^2 - 2*(B^2*b^2*d^2*n*x^2 + 2*B^2*a*b*d^2*n*x + B^2* \\
& a^2*d^2*n)*\log((b*x + a)/(d*x + c))^2 + (B^2*b^2*c^2 - 8*B^2*a*b*c*d + 7*B^ \\
& 2*a^2*d^2)*n - 2*(2*A*B*b^2*c*d - 2*A*B*a*b*d^2 + 3*(B^2*b^2*c*d - B^2*a*b* \\
& d^2)*n)*x - 2*(2*A*B*a^2*d^2 + (3*B^2*b^2*d^2*n + 2*A*B*b^2*d^2)*x^2 - (B^2 \\
& *b^2*c^2 - 4*B^2*a*b*c*d)*n + 2*(2*A*B*a*b*d^2 + (B^2*b^2*c*d + 2*B^2*a*b*d \\
& ^2)*n)*x)*\log((b*x + a)/(d*x + c))*\log(e) - 6*(2*A^2*a^2*d^2 - (B^2*b^2*c^ \\
& 2 - 8*B^2*a*b*c*d)*n^2 + (7*B^2*b^2*d^2*n^2 + 6*A*B*b^2*d^2*n + 2*A^2*b^2*d
\end{aligned}$$

$$\begin{aligned} &^2)x^2 - 2*(A*B*b^2*c^2 - 4*A*B*a*b*c*d)*n + 2*(2*A^2*a*b*d^2 + (3*B^2*b^2 \\ &*c*d + 4*B^2*a*b*d^2)*n^2 + 2*(A*B*b^2*c*d + 2*A*B*a*b*d^2)*n)*x)*\log((b*x \\ &+ a)/(d*x + c)))/((b^5*c^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3) \\ &*g^3*i*x^2 + 2*(a*b^4*c^3 - 3*a^2*b^3*c^2*d + 3*a^3*b^2*c*d^2 - a^4*b*d^3)* \\ &g^3*i*x + (a^2*b^3*c^3 - 3*a^3*b^2*c^2*d + 3*a^4*b*c*d^2 - a^5*d^3)*g^3*i) \end{aligned}$$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*((b\*x+a)/(d\*x+c)))\*\*n))\*\*2/(b\*g\*x+a\*g)\*\*3/(d\*i\*x+c\*i),x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}{(bgx + ag)^3(dx + ci)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c)))^n))^2/(b\*g\*x+a\*g)^3/(d\*i\*x+c\*i),x, algorithm="giac")

[Out] integrate((B\*log(e\*((b\*x + a)/(d\*x + c)))^n) + A)^2/((b\*g\*x + a\*g)^3\*(d\*i\*x + c\*i)), x)



$$3.193 \quad \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^4(ci+dix)} dx$$

**Optimal.** Leaf size=543

$$\frac{b^3(c+dx)^3\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)^2}{3g^4i(a+bx)^3(bc-ad)^4} - \frac{2b^3Bn(c+dx)^3\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{9g^4i(a+bx)^3(bc-ad)^4} + \frac{3b^2d(c+dx)^2\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{2g^4i(a+bx)^2(bc-ad)^4} + \dots$$

[Out]  $(-6*b*B^2*d^2*n^2*(c+d*x))/((b*c-a*d)^4*g^4*i*(a+b*x)) + (3*b^2*B^2*d*n^2*(c+d*x)^2)/(4*(b*c-a*d)^4*g^4*i*(a+b*x)^2) - (2*b^3*B^2*n^2*(c+d*x)^3)/(27*(b*c-a*d)^4*g^4*i*(a+b*x)^3) - (6*b*B*d^2*n*(c+d*x)*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/((b*c-a*d)^4*g^4*i*(a+b*x)) + (3*b^2*B*d*n*(c+d*x)^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(2*(b*c-a*d)^4*g^4*i*(a+b*x)^2) - (2*b^3*B*n*(c+d*x)^3*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(9*(b*c-a*d)^4*g^4*i*(a+b*x)^3) - (3*b*d^2*(c+d*x)*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))^2/((b*c-a*d)^4*g^4*i*(a+b*x)) + (3*b^2*d*(c+d*x)^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))^2/(2*(b*c-a*d)^4*g^4*i*(a+b*x)^2) - (b^3*(c+d*x)^3*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))^2/(3*(b*c-a*d)^4*g^4*i*(a+b*x)^3) - (d^3*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))^3/(3*B*(b*c-a*d)^4*g^4*i*n)$

**Rubi [C]** time = 8.35375, antiderivative size = 2180, normalized size of antiderivative = 4.01, number of steps used = 143, number of rules used = 31, integrand size = 45,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.689$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2/((a\*g + b\*g\*x)^4\*(c\*i + d\*i\*x)), x]

[Out]  $(-2*B^2*n^2)/(27*(b*c-a*d)*g^4*i*(a+b*x)^3) + (19*B^2*d*n^2)/(36*(b*c-a*d)^2*g^4*i*(a+b*x)^2) - (85*B^2*d^2*n^2)/(18*(b*c-a*d)^3*g^4*i*(a+b*x)) - (85*B^2*d^3*n^2*Log[a+b*x])/(18*(b*c-a*d)^4*g^4*i) + (A*B*d^3*n*Log[a+b*x]^2)/((b*c-a*d)^4*g^4*i) + (11*B^2*d^3*n^2*Log[a+b*x]^2)/(6*(b*c-a*d)^4*g^4*i) + (B^2*d^3*Log[-((b*c-a*d)/(d*(a+b*x))])*Log[e*((a+b*x)/(c+d*x))^n])^2/((b*c-a*d)^4*g^4*i)$

$$\begin{aligned}
& a + b*x)/(c + d*x))^n)^2)/((b*c - a*d)^4*g^4*i) + (B^2*d^3*Log[a + b*x]*Log \\
& [e*((a + b*x)/(c + d*x))^n]^2)/((b*c - a*d)^4*g^4*i) - (2*B^n*(A + B*Log[e* \\
& ((a + b*x)/(c + d*x))^n]))/(9*(b*c - a*d)*g^4*i*(a + b*x)^3) + (5*B*d^n*(A \\
& + B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*(b*c - a*d)^2*g^4*i*(a + b*x)^2) - \\
& (11*B*d^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*(b*c - a*d)^3*g^4*i* \\
& (a + b*x)) - (11*B*d^3*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n] \\
& ))/(3*(b*c - a*d)^4*g^4*i) - (A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(3*(b \\
& *c - a*d)*g^4*i*(a + b*x)^3) + (d*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2) \\
& /(2*(b*c - a*d)^2*g^4*i*(a + b*x)^2) - (d^2*(A + B*Log[e*((a + b*x)/(c + d* \\
& x))^n])^2)/((b*c - a*d)^3*g^4*i*(a + b*x)) - (d^3*Log[a + b*x]*(A + B*Log[e \\
& *((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^4*g^4*i) + (85*B^2*d^3*n^2*Log[c \\
& + d*x])/(18*(b*c - a*d)^4*g^4*i) - (2*A*B*d^3*n*Log[-((d*(a + b*x))/(b*c - \\
& a*d))]*Log[c + d*x])/((b*c - a*d)^4*g^4*i) - (11*B^2*d^3*n^2*Log[-((d*(a + \\
& b*x))/(b*c - a*d))]*Log[c + d*x])/(3*(b*c - a*d)^4*g^4*i) - (B^2*d^3*Log[( \\
& a + b*x)^n]^2*Log[c + d*x])/((b*c - a*d)^4*g^4*i) + (11*B*d^3*n*(A + B*Log[ \\
& e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(3*(b*c - a*d)^4*g^4*i) + (d^3*(A \\
& + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[c + d*x])/((b*c - a*d)^4*g^4*i) \\
& + (A*B*d^3*n*Log[c + d*x]^2)/((b*c - a*d)^4*g^4*i) + (11*B^2*d^3*n^2*Log[c \\
& + d*x]^2)/(6*(b*c - a*d)^4*g^4*i) - (B^2*d^3*n^2*Log[a + b*x]*Log[c + d*x]^ \\
& 2)/((b*c - a*d)^4*g^4*i) + (B^2*d^3*n*Log[e*((a + b*x)/(c + d*x))^n]*Log[c \\
& + d*x]^2)/((b*c - a*d)^4*g^4*i) + (B^2*d^3*n^2*Log[c + d*x]^3)/(3*(b*c - a* \\
& d)^4*g^4*i) - (2*A*B*d^3*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b \\
& *c - a*d)^4*g^4*i) - (11*B^2*d^3*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - \\
& a*d)])/((b*c - a*d)^4*g^4*i) + (B^2*d^3*Log[(a + b*x)^n]^2*Log[(b*(c + d* \\
& x))/(b*c - a*d)])/((b*c - a*d)^4*g^4*i) - (2*B^2*d^3*n*Log[a + b*x]*Log[c + \\
& d*x]*Log[(c + d*x)^(-n)])/((b*c - a*d)^4*g^4*i) - (B^2*d^3*Log[a + b*x]*Lo \\
& g[(c + d*x)^(-n)]^2)/((b*c - a*d)^4*g^4*i) + (B^2*d^3*Log[-((d*(a + b*x))/( \\
& b*c - a*d))]*Log[(c + d*x)^(-n)]^2)/((b*c - a*d)^4*g^4*i) + (2*B^2*d^3*n*Lo \\
& g[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x]*(Log[(a + b*x)^n] - Log[e*((a \\
& + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)]))/((b*c - a*d)^4*g^4*i) - (2*A*B \\
& *d^3*n*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^4*g^4*i) - (1 \\
& 1*B^2*d^3*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^4*g^ \\
& 4*i) + (2*B^2*d^3*n*Log[(a + b*x)^n]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d) \\
& )])/((b*c - a*d)^4*g^4*i) - (2*A*B*d^3*n*PolyLog[2, (b*(c + d*x))/(b*c - a* \\
& d)])/((b*c - a*d)^4*g^4*i) - (11*B^2*d^3*n^2*PolyLog[2, (b*(c + d*x))/(b*c \\
& - a*d)])/((b*c - a*d)^4*g^4*i) - (2*B^2*d^3*n*Log[(c + d*x)^(-n)]*PolyLog \\
& [2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^4*i) + (2*B^2*d^3*n*(Log[( \\
& a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)]*PolyLog \\
& [2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^4*i) - (2*B^2*d^3*n*Log[e* \\
& ((a + b*x)/(c + d*x))^n]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - \\
& a*d)^4*g^4*i) - (2*B^2*d^3*n^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])/ \\
& ((b*c - a*d)^4*g^4*i) - (2*B^2*d^3*n^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)] \\
& )/((b*c - a*d)^4*g^4*i) - (2*B^2*d^3*n^2*PolyLog[3, 1 + (b*c - a*d)/(d*(a + \\
& b*x))])/((b*c - a*d)^4*g^4*i)
\end{aligned}$$

Rule 2528

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(Rfx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, Rfx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
Rfx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
```

```
)*(x_)^(q_), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_) + Log[(c_)*(x_)^(n_)])*(b_)/(x_), x_Symbol] := Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rule 2394

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_)^(n_))])*(b_)/((f_) + (g_)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

### Rule 2393

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_))])*(b_)/((f_) + (g_)*(x_)), x_Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_)*((d_) + (e_)*(x_)^(n_))]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rule 6688

```
Int[u_, x_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifyIntegrandQ[v, u, x]]
```

### Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]
```

### Rule 2411

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_)^(n_))])*(b_)^(p_)*((f_) + (g_)*(x_))^(q_)*((h_) + (i_)*(x_))^(r_), x_Symbol] := Dist[1/e, Subst[Int[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
```

\*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2\*r]

#### Rule 2344

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/((x\_)\*((d\_) + (e\_.)\*(x\_))), x\_Symbol] := Dist[1/d, Int[(a + b\*Log[c\*x^n])^p/x, x], x] - Dist[e/d, Int[(a + b\*Log[c\*x^n])^p/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

#### Rule 2317

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/((d\_) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^p)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

#### Rule 2507

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.)\*Log[(i\_.)\*((j\_.)\*((g\_.) + (h\_.)\*(x\_))^(t\_.))^(u\_.)]\*(v\_), x\_Symbol] := With[{k = Simplify[v\*(a + b\*x)\*(c + d\*x)]}, Simp[(k\*Log[i\*(j\*(g + h\*x)^t]^u)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s + 1))/(p\*r\*(s + 1)\*(b\*c - a\*d)), x] - Dist[(k\*h\*t\*u)/(p\*r\*(s + 1)\*(b\*c - a\*d)), Int[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s + 1)/(g + h\*x), x], x] /; FreeQ[k, x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && NeQ[s, -1]

#### Rule 2488

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.)/((g\_.) + (h\_.)\*(x\_)), x\_Symbol] := -Simp[(Log[-(b\*c - a\*d)/(d\*(a + b\*x))]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/h, x] + Dist[(p\*r\*s\*(b\*c - a\*d))/h, Int[(Log[-(b\*c - a\*d)/(d\*(a + b\*x))]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1))/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && EqQ[b\*g - a\*h, 0] && IGtQ[s, 0]

#### Rule 2506

Int[Log[v\_]\*Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.)]^(r\_.)]^(s\_.)\*(u\_), x\_Symbol] := With[{g = Simplify[((v - 1)\*(c + d\*x))/(a + b\*x)], h = Simplify[u\*(a + b\*x)\*(c + d\*x)]}, -Simp[(h\*PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/(b\*c - a\*d), x] + Dist[h\*p\*r\*s, Int[(PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1))/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f

, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]

### Rule 6610

Int[(u\_)\*PolyLog[n\_, v\_], x\_Symbol] := With[{w = DerivativeDivides[v, u\*v, x]}, Simp[w\*PolyLog[n + 1, v], x] /; !FalseQ[w]] /; FreeQ[n, x]

### Rule 2500

Int[(Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]\*((s\_.) + Log[(i\_.)\*((g\_.) + (h\_.)\*(x\_))^(n\_.)]\*(t\_.)))/((j\_.) + (k\_.)\*(x\_)), x\_Symbol] := Dist[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q)^r] - Log[(a + b\*x)^(p\*r)] - Log[(c + d\*x)^(q\*r)], Int[(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x], x] + (Int[(Log[(a + b\*x)^(p\*r)]\*(s + t\*Log[i\*(g + h\*x)^n])]/(j + k\*x), x] + Int[(Log[(c + d\*x)^(q\*r)]\*(s + t\*Log[i\*(g + h\*x)^n])]/(j + k\*x), x)) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0]

### Rule 2433

Int[((a\_.) + Log[(c\_.)\*((d\_.) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_.) + Log[(h\_.)\*((i\_.) + (j\_.)\*(x\_))^(m\_.)]\*(g\_.))\*((k\_.) + (l\_.)\*(x\_))^(r\_.), x\_Symbol] := Dist[1/e, Subst[Int[(k\*x)/d]^r\*(a + b\*Log[c\*x^n])^p\*(f + g\*Log[h\*(e\*i - d\*j)/e + (j\*x)/e]^m), x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e\*k - d\*l, 0]

### Rule 2375

Int[(Log[(d\_.)\*((e\_.) + (f\_.)\*(x\_))^(m\_.))^(r\_.)]\*((a\_.) + Log[(c\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)/(x\_), x\_Symbol] := Simp[(Log[d\*(e + f\*x^m)^r]\*(a + b\*Log[c\*x^n])^(p + 1))/(b\*n\*(p + 1)), x] - Dist[(f\*m\*r)/(b\*n\*(p + 1)), Int[(x^(m - 1)\*(a + b\*Log[c\*x^n])^(p + 1))/(e + f\*x^m), x], x] /; FreeQ[{a, b, c, d, e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d\*e, 1]

### Rule 2374

Int[(Log[(d\_.)\*((e\_.) + (f\_.)\*(x\_))^(m\_.))]\*((a\_.) + Log[(c\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)/(x\_), x\_Symbol] := -Simp[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^p)/m, x] + Dist[(b\*n\*p)/m, Int[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0] && EqQ[d\*e, 1]

### Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_Symbol]
:> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d, e, n, p}, x]
&& EqQ[b*d, a*e]
```

### Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol]
:> Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n)]*(f +
g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, m, n}, x]
&& IntegerQ[r]
```

### Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol]
:> Simp[Log[x]*(a + b*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Log[x]
*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x]
*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, m, n}, x]
&& EqQ[e*i - d*j, 0]
```

### Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*(s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/(j_.)
+ (k_.)*(x_)), x_Symbol]
:> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r)/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dist[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x]
&& NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

### Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.)
*(x_)), x_Symbol]
:> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p}, x]
&& NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

### Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_))^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol]
:> Dist[1/(b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
```

x]

Rule 30

`Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && NeQ[m, -1]`

Rubi steps



$$\begin{aligned}
\int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(193c + 193dx)(ag + bgx)^4} dx &= \int \left( \frac{b\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{193(bc - ad)g^4(a + bx)^4} - \frac{bd\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{193(bc - ad)^2g^4(a + bx)^3} + \frac{bd^2\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{193(bc - ad)^3g^4(a + bx)^2} \right) dx \\
&= -\frac{(bd^3) \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx} dx}{193(bc - ad)^4g^4} + \frac{d^4 \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx} dx}{193(bc - ad)^4g^4} + \frac{(bd^2) \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(a+bx)^2} dx}{193(bc - ad)^3g^4} \\
&= -\frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{579(bc - ad)g^4(a + bx)^3} + \frac{d\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{386(bc - ad)^2g^4(a + bx)^2} - \frac{d^2\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{193(bc - ad)^3g^4(a + bx)} \\
&= -\frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{579(bc - ad)g^4(a + bx)^3} + \frac{d\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{386(bc - ad)^2g^4(a + bx)^2} - \frac{d^2\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{193(bc - ad)^3g^4(a + bx)} \\
&= -\frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{579(bc - ad)g^4(a + bx)^3} + \frac{d\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{386(bc - ad)^2g^4(a + bx)^2} - \frac{d^2\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{193(bc - ad)^3g^4(a + bx)} \\
&= -\frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{579(bc - ad)g^4(a + bx)^3} + \frac{d\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{386(bc - ad)^2g^4(a + bx)^2} - \frac{d^2\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{193(bc - ad)^3g^4(a + bx)} \\
&= -\frac{2Bn\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{1737(bc - ad)g^4(a + bx)^3} + \frac{5Bdn\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{1158(bc - ad)^2g^4(a + bx)^2} - \frac{11Bd^2n\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{579(bc - ad)^3g^4(a + bx)} \\
&= \frac{B^2d^3 \log(a + bx) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{193(bc - ad)^4g^4} - \frac{2Bn\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{1737(bc - ad)g^4(a + bx)^3} + \frac{5Bdn\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{1158(bc - ad)^2g^4(a + bx)^2} \\
&= \frac{B^2d^3 \log\left(-\frac{bc-ad}{d(a+bx)}\right) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{193(bc - ad)^4g^4} + \frac{B^2d^3 \log(a + bx) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{193(bc - ad)^4g^4} - \frac{2Bn\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{1737(bc - ad)g^4(a + bx)^3} \\
&= -\frac{2B^2n^2}{5211(bc - ad)g^4(a + bx)^3} + \frac{19B^2dn^2}{6948(bc - ad)^2g^4(a + bx)^2} - \frac{85B^2d^2n^2}{3474(bc - ad)^3g^4(a + bx)} \\
&= -\frac{2B^2n^2}{5211(bc - ad)g^4(a + bx)^3} + \frac{19B^2dn^2}{6948(bc - ad)^2g^4(a + bx)^2} - \frac{85B^2d^2n^2}{3474(bc - ad)^3g^4(a + bx)}
\end{aligned}$$

**Mathematica [B]** time = 1.898, size = 1295, normalized size = 2.38

$$4 \left( 9A^2 + 6BnA + 2B^2n^2 + 9B^2 \log^2 \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + 9B^2n^2 \log^2 \left( \frac{a+bx}{c+dx} \right) - 6Bn(3A + Bn) \log \left( \frac{a+bx}{c+dx} \right) + 6B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) \left( 3 \right)$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2/((a\*g + b\*g\*x)^4\*(c\*i + d\*i\*x)),x]

[Out] 
$$\begin{aligned} & -(36*B^2*d^3*n^2*(a + b*x)^3*Log[(a + b*x)/(c + d*x)]^3 + 18*B*n*Log[(a + b*x)/(c + d*x)]^2*(6*a^3*A*d^3 + 2*b^3*B*c^3*n - 9*a*b^2*B*c^2*d*n + 18*a^2*b*B*c*d^2*n + 18*a^2*A*b*d^3*x - 3*b^3*B*c^2*d*n*x + 18*a*b^2*B*c*d^2*n*x + 18*a^2*b*B*d^3*n*x + 18*a*A*b^2*d^3*x^2 + 6*b^3*B*c*d^2*n*x^2 + 27*a*b^2*B*d^3*n*x^2 + 6*A*b^3*d^3*x^3 + 11*b^3*B*d^3*n*x^3 + 6*B*d^3*(a + b*x)^3*Log[e*((a + b*x)/(c + d*x))^n] - 6*B*d^3*n*(a + b*x)^3*Log[(a + b*x)/(c + d*x)]) - 3*d*(b*c - a*d)^2*(a + b*x)*(18*A^2 + 30*A*B*n + 19*B^2*n^2 + 18*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 - 6*B*n*(6*A + 5*B*n)*Log[(a + b*x)/(c + d*x)] + 18*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 6*B*Log[e*((a + b*x)/(c + d*x))^n]*(6*A + 5*B*n - 6*B*n*Log[(a + b*x)/(c + d*x)])) + 6*d^2*(b*c - a*d)*(a + b*x)^2*(18*A^2 + 66*A*B*n + 85*B^2*n^2 + 18*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 - 6*B*n*(6*A + 11*B*n)*Log[(a + b*x)/(c + d*x)] + 18*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 6*B*Log[e*((a + b*x)/(c + d*x))^n]*(6*A + 11*B*n - 6*B*n*Log[(a + b*x)/(c + d*x)])) + 6*d^3*(a + b*x)^3*Log[a + b*x]*(18*A^2 + 66*A*B*n + 85*B^2*n^2 + 18*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 - 6*B*n*(6*A + 11*B*n)*Log[(a + b*x)/(c + d*x)] + 18*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 6*B*Log[e*((a + b*x)/(c + d*x))^n]*(6*A + 11*B*n - 6*B*n*Log[(a + b*x)/(c + d*x)])) + 4*(b*c - a*d)^3*(9*A^2 + 6*A*B*n + 2*B^2*n^2 + 9*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 - 6*B*n*(3*A + B*n)*Log[(a + b*x)/(c + d*x)] + 9*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 6*B*Log[e*((a + b*x)/(c + d*x))^n]*(3*A + B*n - 3*B*n*Log[(a + b*x)/(c + d*x)])) + 6*B*(b*c - a*d)*n*Log[(a + b*x)/(c + d*x)]*(3*d*(-(b*c) + a*d)*(a + b*x)*(6*A + 5*B*n + 6*B*Log[e*((a + b*x)/(c + d*x))^n] - 6*B*n*Log[(a + b*x)/(c + d*x)] + 6*d^2*(a + b*x)^2*(6*A + 11*B*n + 6*B*Log[e*((a + b*x)/(c + d*x))^n] - 6*B*n*Log[(a + b*x)/(c + d*x)])) + 4*(b*c - a*d)^2*(3*A + B*n + 3*B*Log[e*((a + b*x)/(c + d*x))^n] - 3*B*n*Log[(a + b*x)/(c + d*x)])) - 6*d^3*(a + b*x)^3*(18*A^2 + 66*A*B*n + 85*B^2*n^2 + 18*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 - 6*B*n*(6*A + 11*B*n)*Log[(a + b*x)/(c + d*x)] + 18*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 6*B*Log[e*((a + b*x)/(c + d*x))^n]*(6*A + 11*B*n - 6*B*n*Log[(a + b*x)/(c + d*x)]))*Log[c + d*x]/(108*(b*c - a*d)^4*g^4*i*(a + b*x)^3) \end{aligned}$$

**Maple [F]** time = 0.71, size = 0, normalized size = 0.

$$\int \frac{1}{(bgx + ag)^4 (dix + ci)} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^4/(d\*i\*x+c\*i),x)

[Out] int((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^4/(d\*i\*x+c\*i),x)

**Maxima [B]** time = 2.82677, size = 4651, normalized size = 8.57

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^4/(d\*i\*x+c\*i),x, algorithm="maxima")

[Out] 
$$\begin{aligned} & -1/6*B^2*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)* \\ & g^4*i*x^3 + 3*(a*b^5*c^3 - 3*a^2*b^4*c^2*d + 3*a^3*b^3*c*d^2 - a^4*b^2*d^3) \\ & *g^4*i*x^2 + 3*(a^2*b^4*c^3 - 3*a^3*b^3*c^2*d + 3*a^4*b^2*c*d^2 - a^5*b*d^3) \\ & )*g^4*i*x + (a^3*b^3*c^3 - 3*a^4*b^2*c^2*d + 3*a^5*b*c*d^2 - a^6*d^3)*g^4*i \\ & ) + 6*d^3*log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^4*i) - 6*d^3*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d \\ & + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^4*i))*log(e*(b*x/(d*x + c) \\ & + a/(d*x + c))^n)^2 - 1/3*A*B*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11 \\ & *a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4 \\ & *c*d^2 - a^3*b^3*d^3)*g^4*i*x^3 + 3*(a*b^5*c^3 - 3*a^2*b^4*c^2*d + 3*a^3*b^3 \\ & *c*d^2 - a^4*b^2*d^3)*g^4*i*x^2 + 3*(a^2*b^4*c^3 - 3*a^3*b^3*c^2*d + 3*a^4 \\ & *b^2*c*d^2 - a^5*b*d^3)*g^4*i*x + (a^3*b^3*c^3 - 3*a^4*b^2*c^2*d + 3*a^5*b \\ & *c*d^2 - a^6*d^3)*g^4*i) + 6*d^3*log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6 \\ & *a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^4*i) - 6*d^3*log(d*x + c)/((b^4 \\ & *c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^4*i) \\ & )*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) - 1/108*((8*b^3*c^3 - 81*a*b^2*c^2 \\ & *d + 648*a^2*b*c*d^2 - 575*a^3*d^3 + 36*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3* \\ & a^2*b*d^3*x + a^3*d^3)*log(b*x + a)^3 - 36*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + \\ & 3*a^2*b*d^3*x + a^3*d^3)*log(d*x + c)^3 + 510*(b^3*c*d^2 - a*b^2*d^3)*x^2 \\ & - 198*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a \end{aligned}$$

$$\begin{aligned}
& )^2 - 18*(11*b^3*d^3*x^3 + 33*a*b^2*d^3*x^2 + 33*a^2*b*d^3*x + 11*a^3*d^3 - \\
& 6*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*\log(b*x + a))* \\
& \log(d*x + c)^2 - 3*(19*b^3*c^2*d - 378*a*b^2*c*d^2 + 359*a^2*b*d^3)*x + 510 \\
& *(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*\log(b*x + a) - 6 \\
& *(85*b^3*d^3*x^3 + 255*a*b^2*d^3*x^2 + 255*a^2*b*d^3*x + 85*a^3*d^3 + 18*(b \\
& ^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*\log(b*x + a)^2 - 66 \\
& *(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*\log(b*x + a))*\log \\
& (d*x + c))*n^2/(a^3*b^4*c^4*g^4*i - 4*a^4*b^3*c^3*d*g^4*i + 6*a^5*b^2*c^2*d^2 \\
& *g^4*i - 4*a^6*b*c*d^3*g^4*i + a^7*d^4*g^4*i + (b^7*c^4*g^4*i - 4*a*b^6*c^3*d*g^4 \\
& *i + 6*a^2*b^5*c^2*d^2*g^4*i - 4*a^3*b^4*c*d^3*g^4*i + a^4*b^3*d^4*g^4*i)*x^3 + 3*(a*b^6*c^4 \\
& *g^4*i - 4*a^2*b^5*c^3*d*g^4*i + 6*a^3*b^4*c^2*d^2*g^4*i - 4*a^4*b^3*c*d^3*g^4*i + a^5*b^2*d^4 \\
& *g^4*i - 4*a^3*b^4*c^3*d*g^4*i + 6*a^4*b^3*c^2*d^2*g^4*i - 4*a^5*b^2*c*d^3*g^4 \\
& *i + a^6*b*d^4*g^4*i)*x) + 6*(4*b^3*c^3 - 27*a*b^2*c^2*d + 108*a^2*b*c*d^2 \\
& - 85*a^3*d^3 + 66*(b^3*c*d^2 - a*b^2*d^3)*x^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3 \\
& *x^2 + 3*a^2*b*d^3*x + a^3*d^3)*\log(b*x + a)^2 - 18*(b^3*d^3*x^3 + 3*a*b^2 \\
& *d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*\log(d*x + c)^2 - 3*(5*b^3*c^2*d - 54*a \\
& *b^2*c*d^2 + 49*a^2*b*d^3)*x + 66*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b \\
& *d^3*x + a^3*d^3)*\log(b*x + a) - 6*(11*b^3*d^3*x^3 + 33*a*b^2*d^3*x^2 + 33*a \\
& ^2*b*d^3*x + 11*a^3*d^3 - 6*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x \\
& + a^3*d^3)*\log(b*x + a))*\log(d*x + c))*n*\log(e*(b*x/(d*x + c) + a/(d*x + c \\
& )))^n/(a^3*b^4*c^4*g^4*i - 4*a^4*b^3*c^3*d*g^4*i + 6*a^5*b^2*c^2*d^2*g^4*i \\
& - 4*a^6*b*c*d^3*g^4*i + a^7*d^4*g^4*i + (b^7*c^4*g^4*i - 4*a*b^6*c^3*d*g^4 \\
& *i + 6*a^2*b^5*c^2*d^2*g^4*i - 4*a^3*b^4*c*d^3*g^4*i + a^4*b^3*d^4*g^4*i)*x^3 + 3*(a*b^6*c^4 \\
& *g^4*i - 4*a^2*b^5*c^3*d*g^4*i + 6*a^3*b^4*c^2*d^2*g^4*i - 4*a^4*b^3*c*d^3*g^4*i + a^5*b^2*d^4 \\
& *g^4*i - 4*a^3*b^4*c^3*d*g^4*i + 6*a^4*b^3*c^2*d^2*g^4*i - 4*a^5*b^2*c*d^3*g^4*i + a^6* \\
& b*d^4*g^4*i)*x))*B^2 - 1/18*(4*b^3*c^3 - 27*a*b^2*c^2*d + 108*a^2*b*c*d^2 - \\
& 85*a^3*d^3 + 66*(b^3*c*d^2 - a*b^2*d^3)*x^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3 \\
& *x^2 + 3*a^2*b*d^3*x + a^3*d^3)*\log(b*x + a)^2 - 18*(b^3*d^3*x^3 + 3*a*b^2 \\
& *d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*\log(d*x + c)^2 - 3*(5*b^3*c^2*d - 54*a* \\
& b^2*c*d^2 + 49*a^2*b*d^3)*x + 66*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3 \\
& *x + a^3*d^3)*\log(b*x + a) - 6*(11*b^3*d^3*x^3 + 33*a*b^2*d^3*x^2 + 33*a^2 \\
& *b*d^3*x + 11*a^3*d^3 - 6*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + \\
& a^3*d^3)*\log(b*x + a))*\log(d*x + c))*A*B*n/(a^3*b^4*c^4*g^4*i - 4*a^4*b^3* \\
& c^3*d*g^4*i + 6*a^5*b^2*c^2*d^2*g^4*i - 4*a^6*b*c*d^3*g^4*i + a^7*d^4*g^4*i \\
& + (b^7*c^4*g^4*i - 4*a*b^6*c^3*d*g^4*i + 6*a^2*b^5*c^2*d^2*g^4*i - 4*a^3*b^4 \\
& *c*d^3*g^4*i + a^4*b^3*d^4*g^4*i)*x^3 + 3*(a*b^6*c^4*g^4*i - 4*a^2*b^5*c^3 \\
& *d*g^4*i + 6*a^3*b^4*c^2*d^2*g^4*i - 4*a^4*b^3*c*d^3*g^4*i + a^5*b^2*d^4*g^4 \\
& *i)*x^2 + 3*(a^2*b^5*c^4*g^4*i - 4*a^3*b^4*c^3*d*g^4*i + 6*a^4*b^3*c^2*d^2 \\
& *g^4*i - 4*a^5*b^2*c*d^3*g^4*i + a^6*b*d^4*g^4*i)*x) - 1/6*A^2*((6*b^2*d^2 \\
& *x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6 \\
& *c^3 - 3*a*b^5*c^2*d + 3*a^2*b^4*c*d^2 - a^3*b^3*d^3)*g^4*i*x^3 + 3*(a*b^5 \\
& *c^3 - 3*a^2*b^4*c^2*d + 3*a^3*b^3*c*d^2 - a^4*b^2*d^3)*g^4*i*x^2 + 3*(a^2* \\
& b^4*c^3 - 3*a^3*b^3*c^2*d + 3*a^4*b^2*c*d^2 - a^5*b*d^3)*g^4*i*x + (a^3*b^3
\end{aligned}$$

$$\begin{aligned} & *c^3 - 3a^4b^2c^2d + 3a^5b^2c^2d^2 - a^6d^3)g^4i) + 6d^3\log(bx + \\ & a)/((b^4c^4 - 4a^2b^3c^3d + 6a^2b^2c^2d^2 - 4a^3b^2c^2d^3 + a^4d^4) \\ & *g^4i) - 6d^3\log(dx + c)/((b^4c^4 - 4a^2b^3c^3d + 6a^2b^2c^2d^2 \\ & - 4a^3b^2c^2d^3 + a^4d^4)g^4i)) \end{aligned}$$

**Fricas [B]** time = 0.693763, size = 3987, normalized size = 7.34

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^4/(d\*i\*x+c\*i),x, a  
lgorithm="fricas")

[Out] 
$$\begin{aligned} & -1/108*(36*A^2*b^3*c^3 - 162*A^2*a*b^2*c^2*d + 324*A^2*a^2*b*c*d^2 - 198*A^2 \\ & *a^3*d^3 + 36*(B^2*b^3*d^3*n^2*x^3 + 3*B^2*a*b^2*d^3*n^2*x^2 + 3*B^2*a^2*b \\ & *d^3*n^2*x + B^2*a^3*d^3*n^2)*\log((b*x + a)/(d*x + c))^3 + (8*B^2*b^3*c^3 - \\ & 81*B^2*a*b^2*c^2*d + 648*B^2*a^2*b*c*d^2 - 575*B^2*a^3*d^3)*n^2 + 6*(18*A^2 \\ & *b^3*c*d^2 - 18*A^2*a*b^2*d^3 + 85*(B^2*b^3*c*d^2 - B^2*a*b^2*d^3)*n^2 + 6 \\ & 6*(A*B*b^3*c*d^2 - A*B*a*b^2*d^3)*n)*x^2 + 18*(2*B^2*b^3*c^3 - 9*B^2*a*b^2* \\ & c^2*d + 18*B^2*a^2*b*c*d^2 - 11*B^2*a^3*d^3 + 6*(B^2*b^3*c*d^2 - B^2*a*b^2* \\ & d^3)*x^2 - 3*(B^2*b^3*c^2*d - 6*B^2*a*b^2*c*d^2 + 5*B^2*a^2*b*d^3)*x + 6*(B \\ & ^2*b^3*d^3*x^3 + 3*B^2*a*b^2*d^3*x^2 + 3*B^2*a^2*b*d^3*x + B^2*a^3*d^3)*\log \\ & ((b*x + a)/(d*x + c))*\log(e)^2 + 18*(6*A*B*a^3*d^3*n + (11*B^2*b^3*d^3*n^2 \\ & + 6*A*B*b^3*d^3*n)*x^3 + (2*B^2*b^3*c^3 - 9*B^2*a*b^2*c^2*d + 18*B^2*a^2*b \\ & *c*d^2)*n^2 + 3*(6*A*B*a*b^2*d^3*n + (2*B^2*b^3*c*d^2 + 9*B^2*a*b^2*d^3)*n^ \\ & 2)*x^2 + 3*(6*A*B*a^2*b*d^3*n - (B^2*b^3*c^2*d - 6*B^2*a*b^2*c*d^2 - 6*B^2* \\ & a^2*b*d^3)*n^2)*x)*\log((b*x + a)/(d*x + c))^2 + 6*(4*A*B*b^3*c^3 - 27*A*B*a \\ & *b^2*c^2*d + 108*A*B*a^2*b*c*d^2 - 85*A*B*a^3*d^3)*n - 3*(18*A^2*b^3*c^2*d \\ & - 108*A^2*a*b^2*c*d^2 + 90*A^2*a^2*b*d^3 + (19*B^2*b^3*c^2*d - 378*B^2*a*b^ \\ & 2*c*d^2 + 359*B^2*a^2*b*d^3)*n^2 + 6*(5*A*B*b^3*c^2*d - 54*A*B*a*b^2*c*d^2 \\ & + 49*A*B*a^2*b*d^3)*n)*x + 6*(12*A*B*b^3*c^3 - 54*A*B*a*b^2*c^2*d + 108*A*B \\ & *a^2*b*c*d^2 - 66*A*B*a^3*d^3 + 6*(6*A*B*b^3*c*d^2 - 6*A*B*a*b^2*d^3 + 11*( \\ & B^2*b^3*c*d^2 - B^2*a*b^2*d^3)*n)*x^2 + 18*(B^2*b^3*d^3*n*x^3 + 3*B^2*a*b^2 \\ & *d^3*n*x^2 + 3*B^2*a^2*b*d^3*n*x + B^2*a^3*d^3*n)*\log((b*x + a)/(d*x + c))^ \\ & 2 + (4*B^2*b^3*c^3 - 27*B^2*a*b^2*c^2*d + 108*B^2*a^2*b*c*d^2 - 85*B^2*a^3* \\ & d^3)*n - 3*(6*A*B*b^3*c^2*d - 36*A*B*a*b^2*c*d^2 + 30*A*B*a^2*b*d^3 + (5*B^ \\ & 2*b^3*c^2*d - 54*B^2*a*b^2*c*d^2 + 49*B^2*a^2*b*d^3)*n)*x + 6*(6*A*B*a^3*d^ \\ & 3 + (11*B^2*b^3*d^3*n + 6*A*B*b^3*d^3)*x^3 + 3*(6*A*B*a*b^2*d^3 + (2*B^2*b^ \\ & 3*c*d^2 + 9*B^2*a*b^2*d^3)*n)*x^2 + (2*B^2*b^3*c^3 - 9*B^2*a*b^2*c^2*d + 18 \\ & *B^2*a^2*b*c*d^2)*n + 3*(6*A*B*a^2*b*d^3 - (B^2*b^3*c^2*d - 6*B^2*a*b^2*c*d \\ & ^2 - 6*B^2*a^2*b*d^3)*n)*x)*\log((b*x + a)/(d*x + c))*\log(e) + 6*(18*A^2*a^ \\ & \end{aligned}$$

```

3*d^3 + (85*B^2*b^3*d^3*n^2 + 66*A*B*b^3*d^3*n + 18*A^2*b^3*d^3)*x^3 + (4*B
^2*b^3*c^3 - 27*B^2*a*b^2*c^2*d + 108*B^2*a^2*b*c*d^2)*n^2 + 3*(18*A^2*a*b^
2*d^3 + (22*B^2*b^3*c*d^2 + 63*B^2*a*b^2*d^3)*n^2 + 6*(2*A*B*b^3*c*d^2 + 9*
A*B*a*b^2*d^3)*n)*x^2 + 6*(2*A*B*b^3*c^3 - 9*A*B*a*b^2*c^2*d + 18*A*B*a^2*b
*c*d^2)*n + 3*(18*A^2*a^2*b*d^3 - (5*B^2*b^3*c^2*d - 54*B^2*a*b^2*c*d^2 - 3
6*B^2*a^2*b*d^3)*n^2 - 6*(A*B*b^3*c^2*d - 6*A*B*a*b^2*c*d^2 - 6*A*B*a^2*b*d
^3)*n)*x*log((b*x + a)/(d*x + c))/((b^7*c^4 - 4*a*b^6*c^3*d + 6*a^2*b^5*c
^2*d^2 - 4*a^3*b^4*c*d^3 + a^4*b^3*d^4)*g^4*i*x^3 + 3*(a*b^6*c^4 - 4*a^2*b^
5*c^3*d + 6*a^3*b^4*c^2*d^2 - 4*a^4*b^3*c*d^3 + a^5*b^2*d^4)*g^4*i*x^2 + 3*
(a^2*b^5*c^4 - 4*a^3*b^4*c^3*d + 6*a^4*b^3*c^2*d^2 - 4*a^5*b^2*c*d^3 + a^6*
b*d^4)*g^4*i*x + (a^3*b^4*c^4 - 4*a^4*b^3*c^3*d + 6*a^5*b^2*c^2*d^2 - 4*a^6
*b*c*d^3 + a^7*d^4)*g^4*i)

```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c)))**n))**2/(b*g*x+a*g)**4/(d*i*x+c*i),x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}{(bgx + ag)^4(dx + ci)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c)))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i),x, a
lgorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c)))^n + A)^2/((b*g*x + a*g)^4*(d*i*x
+ c*i))), x)
```

$$3.194 \quad \int \frac{(ag+bgx)^3 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ci+dix)^2} dx$$

**Optimal.** Leaf size=770

$$\frac{6bBg^3n(bc-ad)^2 \text{PolyLog} \left( 2, \frac{d(a+bx)}{b(c+dx)} \right) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{d^4 i^2} - \frac{6bB^2g^3n^2(bc-ad)^2 \text{PolyLog} \left( 2, \frac{d(a+bx)}{b(c+dx)} \right)}{d^4 i^2} - \frac{bB^2g^3n^2}{d^4 i^2}$$

```
[Out] (2*A*B*(b*c - a*d)^2*g^3*n*(a + b*x))/(d^3*i^2*(c + d*x)) - (2*B^2*(b*c - a
*d)^2*g^3*n^2*(a + b*x))/(d^3*i^2*(c + d*x)) + (2*B^2*(b*c - a*d)^2*g^3*n*(
a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(d^3*i^2*(c + d*x)) - (b*B*(b*c -
a*d)*g^3*n*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(d^3*i^2) - (3
*b*(b*c - a*d)*g^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(d^3
*i^2) - ((b*c - a*d)^2*g^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
^2)/(d^3*i^2*(c + d*x)) + (b^3*g^3*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c +
d*x))^n])^2)/(2*d^4*i^2) - (6*b*B*(b*c - a*d)^2*g^3*n*(A + B*Log[e*((a + b
*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))]/(d^4*i^2) - (3*b*(b*c -
a*d)^2*g^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[(b*c - a*d)/(b*(c +
d*x))]/(d^4*i^2) + (b*B^2*(b*c - a*d)^2*g^3*n^2*Log[c + d*x])/(d^4*i^2) +
(b*B*(b*c - a*d)^2*g^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[1 - (b
*(c + d*x))/(d*(a + b*x))]/(d^4*i^2) - (6*b*B^2*(b*c - a*d)^2*g^3*n^2*Poly
Log[2, (d*(a + b*x))/(b*(c + d*x))]/(d^4*i^2) - (6*b*B*(b*c - a*d)^2*g^3*n
*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*PolyLog[2, (d*(a + b*x))/(b*(c + d*
x))]/(d^4*i^2) - (b*B^2*(b*c - a*d)^2*g^3*n^2*PolyLog[2, (b*(c + d*x))/(d*
(a + b*x))]/(d^4*i^2) + (6*b*B^2*(b*c - a*d)^2*g^3*n^2*PolyLog[3, (d*(a +
b*x))/(b*(c + d*x))]/(d^4*i^2)
```

**Rubi [B]** time = 6.01486, antiderivative size = 2384, normalized size of antiderivative = 3.1, number of steps used = 112, number of rules used = 28, integrand size = 45,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.622$ , Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 2486, 31, 44, 6688, 6742, 2500, 2433, 2375, 2317, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i + d*i*x
)^2,x]
```

```

[Out] -((A*b^2*B*(b*c - a*d)*g^3*n*x)/(d^3*i^2)) + (2*B^2*(b*c - a*d)^3*g^3*n^2)/
(d^4*i^2*(c + d*x)) + (2*b*B^2*(b*c - a*d)^2*g^3*n^2*Log[a + b*x])/(d^4*i^2
) + (a^2*b*B^2*g^3*n^2*Log[a + b*x]^2)/(2*d^2*i^2) + (a*b*B^2*(2*b*c - 3*a*
d)*g^3*n^2*Log[a + b*x]^2)/(d^3*i^2) + (b*B^2*(b*c - a*d)^2*g^3*n^2*Log[a +
b*x]^2)/(d^4*i^2) - (b*B^2*(b*c - a*d)*g^3*n*(a + b*x)*Log[e*((a + b*x)/(c
+ d*x))^n])/(d^3*i^2) - (2*B*(b*c - a*d)^3*g^3*n*(A + B*Log[e*((a + b*x)/(
c + d*x))^n]))/(d^4*i^2*(c + d*x)) - (a^2*b*B*g^3*n*Log[a + b*x]*(A + B*Log
[e*((a + b*x)/(c + d*x))^n]))/(d^2*i^2) - (2*a*b*B*(2*b*c - 3*a*d)*g^3*n*Lo
g[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(d^3*i^2) - (2*b*B*(b*c
- a*d)^2*g^3*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(d^4*i^
2) - (b^2*(2*b*c - 3*a*d)*g^3*x*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(
d^3*i^2) + (b^3*g^3*x^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*d^2*i^
2) + ((b*c - a*d)^3*g^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(d^4*i^2*
(c + d*x)) - (b*B^2*(b*c - a*d)^2*g^3*n^2*Log[c + d*x])/(d^4*i^2) - (6*A*b*
B*(b*c - a*d)^2*g^3*n*Log[-((d*(a + b*x))/(b*c - a*d))] * Log[c + d*x])/(d^4*
i^2) - (b^3*B^2*c^2*g^3*n^2*Log[-((d*(a + b*x))/(b*c - a*d))] * Log[c + d*x]
)/(d^4*i^2) - (2*b^2*B^2*c*(2*b*c - 3*a*d)*g^3*n^2*Log[-((d*(a + b*x))/(b*c
- a*d))] * Log[c + d*x])/(d^4*i^2) - (2*b*B^2*(b*c - a*d)^2*g^3*n^2*Log[-((d*
(a + b*x))/(b*c - a*d))] * Log[c + d*x])/(d^4*i^2) - (3*b*B^2*(b*c - a*d)^2*g
^3*Log[(a + b*x)^n]^2*Log[c + d*x])/(d^4*i^2) + (b^3*B^2*c^2*g^3*n*(A + B*Log
[e*((a + b*x)/(c + d*x))^n]) * Log[c + d*x])/(d^4*i^2) + (2*b^2*B*c*(2*b*c -
3*a*d)*g^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) * Log[c + d*x])/(d^4*i^2
) + (2*b*B*(b*c - a*d)^2*g^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) * Log[c
+ d*x])/(d^4*i^2) + (3*b*(b*c - a*d)^2*g^3*(A + B*Log[e*((a + b*x)/(c + d*x
))^n])^2*Log[c + d*x])/(d^4*i^2) + (3*A*b*B*(b*c - a*d)^2*g^3*n*Log[c + d*x
]^2)/(d^4*i^2) + (b^3*B^2*c^2*g^3*n^2*Log[c + d*x]^2)/(2*d^4*i^2) + (b^2*B^
2*c*(2*b*c - 3*a*d)*g^3*n^2*Log[c + d*x]^2)/(d^4*i^2) + (b*B^2*(b*c - a*d)^
2*g^3*n^2*Log[c + d*x]^2)/(d^4*i^2) - (3*b*B^2*(b*c - a*d)^2*g^3*n^2*Log[a
+ b*x]*Log[c + d*x]^2)/(d^4*i^2) + (3*b*B^2*(b*c - a*d)^2*g^3*n*Log[e*((a +
b*x)/(c + d*x))^n]*Log[c + d*x]^2)/(d^4*i^2) + (b*B^2*(b*c - a*d)^2*g^3*n^
2*Log[c + d*x]^3)/(d^4*i^2) - (a^2*b*B^2*g^3*n^2*Log[a + b*x]*Log[(b*(c + d
*x))/(b*c - a*d)])/(d^2*i^2) - (2*a*b*B^2*(2*b*c - 3*a*d)*g^3*n^2*Log[a + b
*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(d^3*i^2) - (2*b*B^2*(b*c - a*d)^2*g^3*
n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(d^4*i^2) + (3*b*B^2*(b*c
- a*d)^2*g^3*Log[(a + b*x)^n]^2*Log[(b*(c + d*x))/(b*c - a*d)])/(d^4*i^2) -
(6*b*B^2*(b*c - a*d)^2*g^3*n*Log[a + b*x]*Log[c + d*x]*Log[(c + d*x)^(-n)]
)/(d^4*i^2) - (3*b*B^2*(b*c - a*d)^2*g^3*Log[a + b*x]*Log[(c + d*x)^(-n)]^2
)/(d^4*i^2) + (3*b*B^2*(b*c - a*d)^2*g^3*Log[-((d*(a + b*x))/(b*c - a*d))] *
Log[(c + d*x)^(-n)]^2)/(d^4*i^2) + (6*b*B^2*(b*c - a*d)^2*g^3*n*Log[-((d*(a
+ b*x))/(b*c - a*d))] * Log[c + d*x]*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c
+ d*x))^n] + Log[(c + d*x)^(-n)]))/(d^4*i^2) - (a^2*b*B^2*g^3*n^2*PolyLog[
2, -((d*(a + b*x))/(b*c - a*d))]/(d^2*i^2) - (2*a*b*B^2*(2*b*c - 3*a*d)*g^
3*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))]/(d^3*i^2) - (2*b*B^2*(b*c -
a*d)^2*g^3*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))]/(d^4*i^2) + (6*b*
B^2*(b*c - a*d)^2*g^3*n*Log[(a + b*x)^n]*PolyLog[2, -((d*(a + b*x))/(b*c -

```



```

a*d)))]/(d^4*i^2) - (6*A*b*B*(b*c - a*d)^2*g^3*n*PolyLog[2, (b*(c + d*x))/(
b*c - a*d)]/(d^4*i^2) - (b^3*B^2*c^2*g^3*n^2*PolyLog[2, (b*(c + d*x))/(b*c
- a*d)]/(d^4*i^2) - (2*b^2*B^2*c*(2*b*c - 3*a*d)*g^3*n^2*PolyLog[2, (b*(c
+ d*x))/(b*c - a*d)]/(d^4*i^2) - (2*b*B^2*(b*c - a*d)^2*g^3*n^2*PolyLog[2
, (b*(c + d*x))/(b*c - a*d)]/(d^4*i^2) - (6*b*B^2*(b*c - a*d)^2*g^3*n*Log[
(c + d*x)^(-n)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]/(d^4*i^2) + (6*b*B^2
*(b*c - a*d)^2*g^3*n*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + L
og[(c + d*x)^(-n)])*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]/(d^4*i^2) - (6*b
*B^2*(b*c - a*d)^2*g^3*n^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d)))]/(d^4*i
^2) - (6*b*B^2*(b*c - a*d)^2*g^3*n^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)]
)/(d^4*i^2)

```

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFX^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFX, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]

```

### Rule 2523

```

Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.), x_Symbol] := Simp[x*(a +
b*Log[c*RFX^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFX, x] && IGtQ[n, 0]

```

### Rule 12

```

Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]

```

### Rule 2524

```

Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFX^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0]

```

### Rule 2418

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFX_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFX, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFX, x] && IntegerQ[p]

```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*
(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] := Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)
^q]^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
```

$d*x)^q]^r]^{(s-1)/(c+d*x), x], x] /; \text{FreeQ}[\{a, b, c, d, e, f, p, q, r, s\}, x] \ \&\& \ \text{NeQ}[b*c - a*d, 0] \ \&\& \ \text{EqQ}[p + q, 0] \ \&\& \ \text{IGtQ}[s, 0]$

### Rule 31

$\text{Int}[(a_ + (b_)*(x_))^{-1}, x\_Symbol] \ :> \ \text{Simp}[\text{Log}[\text{RemoveContent}[a + b*x, x]]/b, x] /; \text{FreeQ}[\{a, b\}, x]$

### Rule 44

$\text{Int}[(a_ + (b_)*(x_))^{(m_)}*((c_ + (d_)*(x_))^{(n_)}), x\_Symbol] \ :> \ \text{Int}[\text{ExpandIntegrand}[(a + b*x)^m*(c + d*x)^n, x], x] /; \text{FreeQ}[\{a, b, c, d\}, x] \ \&\& \ \text{NeQ}[b*c - a*d, 0] \ \&\& \ \text{ILtQ}[m, 0] \ \&\& \ \text{IntegerQ}[n] \ \&\& \ !(\text{IGtQ}[n, 0] \ \&\& \ \text{LtQ}[m + n + 2, 0])$

### Rule 6688

$\text{Int}[u_, x\_Symbol] \ :> \ \text{With}[\{v = \text{SimplifyIntegrand}[u, x]\}, \text{Int}[v, x] /; \text{SimplerIntegrandQ}[v, u, x]$

### Rule 6742

$\text{Int}[u_, x\_Symbol] \ :> \ \text{With}[\{v = \text{ExpandIntegrand}[u, x]\}, \text{Int}[v, x] /; \text{SumQ}[v]$   
]

### Rule 2500

$\text{Int}[(\text{Log}[(e_)*((f_)*((a_ + (b_)*(x_))^{(p_)}*((c_ + (d_)*(x_))^{(q_)}))^{(r_)}])^{(s_)} + \text{Log}[(i_)*((g_ + (h_)*(x_))^{(n_)})*(t_))]/((j_ + (k_)*(x_))), x\_Symbol] \ :> \ \text{Dist}[\text{Log}[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - \text{Log}[(a + b*x)^{p*r}] - \text{Log}[(c + d*x)^{q*r}], \text{Int}[(s + t*\text{Log}[i*(g + h*x)^n])/(j + k*x), x], x] + (\text{Int}[(\text{Log}[(a + b*x)^{p*r}])*(s + t*\text{Log}[i*(g + h*x)^n])]/(j + k*x), x] + \text{Int}[(\text{Log}[(c + d*x)^{q*r}])*(s + t*\text{Log}[i*(g + h*x)^n])]/(j + k*x), x]) /; \text{FreeQ}[\{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r\}, x] \ \&\& \ \text{NeQ}[b*c - a*d, 0]$

### Rule 2433

$\text{Int}[(a_ + \text{Log}[(c_)*((d_ + (e_)*(x_))^{(n_)})*(b_))^{(p_)}*((f_ + \text{Log}[(h_)*((i_ + (j_)*(x_))^{(m_)})*(g_))*((k_ + (l_)*(x_))^{(r_)}), x\_Symbol] \ :> \ \text{Dist}[1/e, \text{Subst}[\text{Int}[(k*x)/d]^r*(a + b*\text{Log}[c*x^n])^p*(f + g*\text{Log}[h*(e*i - d*j)/e + (j*x)/e]^m), x], x, d + e*x], x] /; \text{FreeQ}[\{a, b, c, d, e, f, g, h, i, j, k, l, n, p, r\}, x] \ \&\& \ \text{EqQ}[e*k - d*1, 0]$

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]^(r_.))*((a_.) + Log[(c_.)*(x_)^(n_.)
])*((b_.))^(p_.)]/(x_), x_Symbol] := Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] := Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.)]/(x_), x_Symbol] := -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_)^(p_.))]/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_)^(m_.)]*(g_.))*((k_) + (l_.)*(x_)^(r_.)), x_Symbol] :=
Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*1)/1) + (e*x)/1)^n])*(f +
g*Log[h*(-((j*k - i*1)/1) + (j*x)/1)^m]), x], x, k + l*x], x] /; FreeQ[{a,
b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_)^(m_.)]*(g_.)))/(x_), x_Symbol] := Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n])]/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m))]/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
```

, g, h, i, j, m, n}, x] && EqQ[e\*i - d\*j, 0]

### Rule 2499

Int[(Log[(e\_.)\*((f\_.)\*(a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.) )^(r\_.)]\*((s\_.) + Log[(i\_.)\*(g\_.) + (h\_.)\*(x\_)]^(n\_.)]\*(t\_.))^(m\_.))/((j\_. ) + (k\_.)\*(x\_)), x\_Symbol] := Simp[((s + t\*Log[i\*(g + h\*x)^n])^(m + 1)\*Log[ e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r)/(k\*n\*t\*(m + 1)), x] + (-Dist[(b\*p\*r)/(k\*n \*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(a + b\*x), x], x] - Dis t[(d\*q\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(c + d\*x) , x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0] && EqQ[h\*j - g\*k, 0] && IGtQ[m, 0]

### Rule 2396

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_)/((f\_.) + (g\_. )\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])^p)/g, x] - Dist[(b\*e\*n\*p)/g, Int[(Log[(e\*(f + g\*x))/(e\*f - d\*g)] \* (a + b\*Log[c\*(d + e\*x)^n])^(p - 1))/(d + e\*x), x], x] /; FreeQ[{a, b, c, d , e, f, g, n, p}, x] && NeQ[e\*f - d\*g, 0] && IGtQ[p, 1]

### Rule 2302

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/(x\_), x\_Symbol] := Dist[1/( b\*n), Subst[Int[x^p, x], x, a + b\*Log[c\*x^n]], x] /; FreeQ[{a, b, c, n, p}, x]

### Rule 30

Int[(x\_)^(m\_.), x\_Symbol] := Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && NeQ[m, -1]

### Rubi steps

$$\begin{aligned}
\int \frac{(ag + bgx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(194c + 194dx)^2} dx &= \int \left( -\frac{b^2(2bc - 3ad)g^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{37636d^3} + \frac{b^3g^3x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{37636d^2} \right) dx \\
&= \frac{(b^3g^3) \int x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx}{37636d^2} - \frac{(b^2(2bc - 3ad)g^3) \int \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx}{37636d^3} \\
&= -\frac{b^2(2bc - 3ad)g^3x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{37636d^3} + \frac{b^3g^3x^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{75272d^2} \\
&= -\frac{b^2(2bc - 3ad)g^3x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{37636d^3} + \frac{b^3g^3x^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{75272d^2} \\
&= -\frac{b^2(2bc - 3ad)g^3x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{37636d^3} + \frac{b^3g^3x^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{75272d^2} \\
&= -\frac{b^2(2bc - 3ad)g^3x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{37636d^3} + \frac{b^3g^3x^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{75272d^2} \\
&= -\frac{Ab^2B(bc - ad)g^3nx}{37636d^3} - \frac{B(bc - ad)^3g^3n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{18818d^4(c + dx)} - \frac{a^2bBg^3n}{37636d^3} \\
&= -\frac{Ab^2B(bc - ad)g^3nx}{37636d^3} - \frac{bB^2(bc - ad)g^3n(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{37636d^3} - \frac{B(bc - ad)}{37636d^3} \\
&= -\frac{Ab^2B(bc - ad)g^3nx}{37636d^3} - \frac{bB^2(bc - ad)g^3n(a + bx) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{37636d^3} - \frac{B(bc - ad)}{37636d^3} \\
&= -\frac{Ab^2B(bc - ad)g^3nx}{37636d^3} + \frac{B^2(bc - ad)^3g^3n^2}{18818d^4(c + dx)} + \frac{bB^2(bc - ad)^2g^3n^2 \log(a + bx)}{18818d^4} \\
&= -\frac{Ab^2B(bc - ad)g^3nx}{37636d^3} + \frac{B^2(bc - ad)^3g^3n^2}{18818d^4(c + dx)} + \frac{bB^2(bc - ad)^2g^3n^2 \log(a + bx)}{18818d^4} \\
&= -\frac{Ab^2B(bc - ad)g^3nx}{37636d^3} + \frac{B^2(bc - ad)^3g^3n^2}{18818d^4(c + dx)} + \frac{bB^2(bc - ad)^2g^3n^2 \log(a + bx)}{18818d^4}
\end{aligned}$$

**Mathematica [B]** time = 8.93163, size = 4312, normalized size = 5.6

Result too large to show

Antiderivative was successfully verified.

[In] Integrate[((a\*g + b\*g\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(c\*i + d\*i\*x)^2,x]

[Out] 
$$-\left(\frac{b^2(2bc - 3ad)g^3x(A + B(\log\left(\frac{a + bx}{c + dx}\right))^n) - n\log\left(\frac{a + bx}{c + dx}\right)}{d^3i^2}\right) + \frac{b^3g^3x^2(A + B(\log\left(\frac{a + bx}{c + dx}\right))^n) - n\log\left(\frac{a + bx}{c + dx}\right)}{2d^2i^2} + \frac{A^2b^3c^3g^3 - 3aA^2b^2c^2dg^3 + 3a^2A^2b^2c^2dg^3 - a^3A^2d^3g^3 + 2Ab^3Bc^3g^3(\log\left(\frac{a + bx}{c + dx}\right))^n - n\log\left(\frac{a + bx}{c + dx}\right)}{d^2i^2} - \frac{6aA^2b^2Bc^2dg^3(\log\left(\frac{a + bx}{c + dx}\right))^n - n\log\left(\frac{a + bx}{c + dx}\right) + 6a^2A^2b^2Bc^2dg^3(\log\left(\frac{a + bx}{c + dx}\right))^n - n\log\left(\frac{a + bx}{c + dx}\right) - 2a^3A^2Bd^3g^3(\log\left(\frac{a + bx}{c + dx}\right))^n - n\log\left(\frac{a + bx}{c + dx}\right) + b^3B^2c^3g^3(\log\left(\frac{a + bx}{c + dx}\right))^n - n\log\left(\frac{a + bx}{c + dx}\right)^2 - 3ab^2B^2c^2dg^3(\log\left(\frac{a + bx}{c + dx}\right))^n - n\log\left(\frac{a + bx}{c + dx}\right)^2 + 3a^2b^2B^2c^2dg^3(\log\left(\frac{a + bx}{c + dx}\right))^n - n\log\left(\frac{a + bx}{c + dx}\right)^2 - a^3B^2d^3g^3(\log\left(\frac{a + bx}{c + dx}\right))^n - n\log\left(\frac{a + bx}{c + dx}\right)^2}{d^4i^2(c + dx)} + \frac{(3b(b^2c - ad)^2g^3(A + B(\log\left(\frac{a + bx}{c + dx}\right))^n) - n\log\left(\frac{a + bx}{c + dx}\right))^2 \log(c + dx)}{d^4i^2} + \frac{(2a^3B^2g^3n(A + B(\log\left(\frac{a + bx}{c + dx}\right))^n) - n\log\left(\frac{a + bx}{c + dx}\right)) \left(\frac{c}{d} + x\right) (\log\left(\frac{c}{d} + x\right) + \log^2\left(\frac{c}{d} + x\right))}{(c + dx)^2 \log\left(\frac{c}{d} + x\right)} + \frac{(d\left(\frac{a}{b} + x\right) \log\left[\frac{a}{b} + x\right]) / (-c + (ad)/b)^2 (1 - (d(a/b + x)) / (-c + (ad)/b)) + \log\left[1 - (d(a/b + x)) / (-c + (ad)/b)\right] / (-c + (ad)/b)}{d} - \frac{(-\log\left[\frac{a}{b} + x\right] + \log\left[\frac{c}{d} + x\right] + \log\left[\frac{a}{c + dx} + \frac{bx}{c + dx}\right]) / (d(c + dx))}{i^2} + \frac{(2b^3B^2g^3n(A + B(\log\left(\frac{a + bx}{c + dx}\right))^n) - n\log\left(\frac{a + bx}{c + dx}\right)) \left(-2c\left(\frac{a}{b} + x\right) (-1 + \log\left[\frac{a}{b} + x\right])\right)}{d^3} + \frac{(2c(c/d + x) (-1 + \log\left[\frac{c}{d} + x\right]))}{d^3} - \frac{(3c^2 \log\left[\frac{c}{d} + x\right]^2)}{(2d^4)} - \frac{(c^3(1 + \log\left[\frac{c}{d} + x\right]))}{(d^4(c + dx))} + \frac{((ax)/(2b) - x^2/4 + (x^2 \log\left[\frac{a}{b} + x\right]))}{2} - \frac{(a^2 \log\left[\frac{a + bx}{c + dx}\right])}{(2b^2)} / d^2 - \frac{((cx)/(2d) - x^2/4 + (x^2 \log\left[\frac{c}{d} + x\right]))}{2} - \frac{(c^2 \log\left[\frac{c}{d} + x\right])}{(2d^2)} / d^2 - \frac{(c^3(-(\log\left[\frac{a}{b} + x\right]) / (d(c + dx))) + (b(\log\left[\frac{a + bx}{c + dx}\right]) / (b^2c - ad) - \log\left[\frac{c + dx}{b^2c - ad}\right]))}{d} / d^3 + \frac{((-4cdx + d^2x^2 + (2c^3)/(c + dx) + 6c^2 \log\left[\frac{c}{d} + x\right]) (-\log\left[\frac{a}{b} + x\right] + \log\left[\frac{c}{d} + x\right] + \log\left[\frac{a}{c + dx} + \frac{bx}{c + dx}\right]))}{(2d^4)} + \frac{(3c^2((\log\left[\frac{a}{b} + x\right] \log\left[\frac{c + dx}{c - (ad)/b}\right]) / d + \text{PolyLog}\left[2, \frac{b^2d(a/b + x)}{-(b^2c + ad)}\right] / d))}{d^3} / i^2 + \frac{(6a^2b^2B^2g^3n(A + B(\log\left(\frac{a + bx}{c + dx}\right))^n) - n\log\left(\frac{a + bx}{c + dx}\right)) \left(\frac{a}{b} + x\right) (-1 + \log\left[\frac{a}{b} + x\right])}{d^2} - \frac{((c/d + x) (-1 + \log\left[\frac{c}{d} + x\right]))}{d^2} + \frac{(c \log\left[\frac{c}{d} + x\right]^2)}{d^3} + \frac{(c^2(1 + \log\left[\frac{c}{d} + x\right]))}{(d^3(c + dx))} + \frac{(c^2(-(\log\left[\frac{a}{b} + x\right]) / (d(c + dx))))}{d} + \frac{(b(\log\left[\frac{a + bx}{c + dx}\right]) / (b^2c - ad) - \log\left[\frac{c + dx}{b^2c - ad}\right])}{d} / d^2 + \frac{((dx -$$

$$\begin{aligned}
& c^2/(c + dx) - 2c \cdot \text{Log}[c + dx] \cdot (-\text{Log}[a/b + x] + \text{Log}[c/d + x] + \text{Log}[a/(c + dx) + (bx)/(c + dx)]) / d^3 - (2c \cdot ((\text{Log}[a/b + x] \cdot \text{Log}[(c + dx)/(c - (a \cdot d)/b)]) / d + \text{PolyLog}[2, (bd \cdot (a/b + x)) / (-(bc) + ad)] / d)) / d^2) / i^2 + (6a^2 \cdot b \cdot B \cdot g^{3n} \cdot (A + B \cdot (\text{Log}[e \cdot ((a + bx)/(c + dx))^n] - n \cdot \text{Log}[(a + bx)/(c + dx)])) \cdot (-\text{Log}[c/d + x]^2 / (2d^2) - (c \cdot (1 + \text{Log}[c/d + x])) / (d^2 \cdot (c + dx))) \\
& - (c \cdot (-\text{Log}[a/b + x] / (d \cdot (c + dx))) + (b \cdot (\text{Log}[a + bx] / (bc - ad) - \text{Log}[c + dx] / (bc - ad))) / d) / d + ((c / (c + dx) + \text{Log}[c + dx]) \cdot (-\text{Log}[a/b + x] + \text{Log}[c/d + x] + \text{Log}[a/(c + dx) + (bx)/(c + dx)])) / d^2 + ((\text{Log}[a/b + x] \cdot \text{Log}[(c + dx)/(c - (a \cdot d)/b)]) / d + \text{PolyLog}[2, (bd \cdot (a/b + x)) / (-(bc) + ad)] / d) / d) / i^2 - (a^3 \cdot B^2 \cdot g^{3n} \cdot (2bc - 2ad + 2b \cdot (c + dx) \cdot \text{Log}[a + bx] - 2 \cdot (bc - ad) \cdot \text{Log}[(a + bx)/(c + dx)] - 2b \cdot (c + dx) \cdot \text{Log}[a + bx] \cdot \text{Log}[(a + bx)/(c + dx)] + (bc - ad) \cdot \text{Log}[(a + bx)/(c + dx)]^2 - 2b \cdot (c + dx) \cdot \text{Log}[c + dx] - 2b \cdot (c + dx) \cdot \text{Log}[(a + bx)/(c + dx)] \cdot \text{Log}[(bc - ad)/(bc + bdx)] + b \cdot (c + dx) \cdot (\text{Log}[a + bx] \cdot (\text{Log}[a + bx] - 2 \cdot \text{Log}[(b \cdot (c + dx)) / (bc - ad)])) - 2 \cdot \text{PolyLog}[2, (d \cdot (a + bx)) / (-(bc) + ad)] + b \cdot (c + dx) \cdot (\text{Log}[(bc - ad)/(bc + bdx)] \cdot (2 \cdot \text{Log}[(d \cdot (a + bx)) / (-(bc) + ad)] + \text{Log}[(bc - ad)/(bc + bdx)]) - 2 \cdot \text{PolyLog}[2, (b \cdot (c + dx)) / (bc - ad)])) / (d \cdot (bc - ad) \cdot i^2 \cdot (c + dx)) + (3a \cdot b^2 \cdot B^2 \cdot g^{3n} \cdot ((d \cdot (a + bx) \cdot \text{Log}[(a + bx)/(c + dx)]^2) / b - (c^2 \cdot \text{Log}[(a + bx)/(c + dx)]^2) / (c + dx) + 2c \cdot \text{Log}[(a + bx)/(c + dx)]^2 \cdot \text{Log}[(bc - ad)/(bc + bdx)] - (c^2 \cdot (2bc - 2ad + 2b \cdot (c + dx) \cdot \text{Log}[a + bx] - 2 \cdot (bc - ad) \cdot \text{Log}[(a + bx)/(c + dx)] - 2b \cdot (c + dx) \cdot \text{Log}[a + bx] \cdot \text{Log}[(a + bx)/(c + dx)] - 2b \cdot (c + dx) \cdot \text{Log}[c + dx] - 2b \cdot (c + dx) \cdot \text{Log}[(a + bx)/(c + dx)] \cdot \text{Log}[(bc - ad)/(bc + bdx)] + b \cdot (c + dx) \cdot (\text{Log}[a + bx] \cdot (\text{Log}[a + bx] - 2 \cdot \text{Log}[(b \cdot (c + dx)) / (bc - ad)])) - 2 \cdot \text{PolyLog}[2, (d \cdot (a + bx)) / (-(bc) + ad)] + b \cdot (c + dx) \cdot (\text{Log}[(bc - ad)/(bc + bdx)] \cdot (2 \cdot \text{Log}[(d \cdot (a + bx)) / (-(bc) + ad)] + \text{Log}[(bc - ad)/(bc + bdx)]) - 2 \cdot \text{PolyLog}[2, (b \cdot (c + dx)) / (bc - ad)])) / ((bc - ad) \cdot (c + dx)) - ((bc - ad) \cdot (\text{Log}[(bc - ad)/(bc + bdx)] \cdot (2 \cdot \text{Log}[(d \cdot (a + bx)) / (-(bc) + ad)] - 2 \cdot \text{Log}[(a + bx)/(c + dx)] + \text{Log}[(bc - ad)/(bc + bdx)])) - 2 \cdot \text{PolyLog}[2, (b \cdot (c + dx)) / (bc - ad)])) / b + 4c \cdot (\text{Log}[(a + bx)/(c + dx)] \cdot \text{PolyLog}[2, (d \cdot (a + bx)) / (b \cdot (c + dx))] - \text{PolyLog}[3, (d \cdot (a + bx)) / (b \cdot (c + dx))]) / (d^3 \cdot i^2) + (b^3 \cdot B^2 \cdot g^{3n} \cdot (d^2 \cdot x^2 \cdot \text{Log}[(a + bx)/(c + dx)]^2 - (4c \cdot d \cdot (a + bx) \cdot \text{Log}[(a + bx)/(c + dx)]^2) / b + (2c^3 \cdot \text{Log}[(a + bx)/(c + dx)]^2) / (c + dx) - 6c^2 \cdot \text{Log}[(a + bx)/(c + dx)]^2 \cdot \text{Log}[(bc - ad)/(bc + bdx)] - (2d \cdot (bc - ad) \cdot (a + bx) \cdot \text{Log}[(a + bx)/(c + dx)] + 2a^2 \cdot d^2 \cdot \text{Log}[a + bx] \cdot \text{Log}[(a + bx)/(c + dx)] - 2 \cdot (bc - ad)^2 \cdot \text{Log}[c + dx] + 2b^2 \cdot c^2 \cdot \text{Log}[(a + bx)/(c + dx)] \cdot \text{Log}[(bc - ad)/(bc + bdx)] - a^2 \cdot d^2 \cdot (\text{Log}[a + bx] \cdot (\text{Log}[a + bx] - 2 \cdot \text{Log}[(b \cdot (c + dx)) / (bc - ad)])) - 2 \cdot \text{PolyLog}[2, (d \cdot (a + bx)) / (-(bc) + ad)] - b^2 \cdot c^2 \cdot (\text{Log}[(bc - ad)/(bc + bdx)] \cdot (2 \cdot \text{Log}[(d \cdot (a + bx)) / (-(bc) + ad)] + \text{Log}[(bc - ad)/(bc + bdx)]) - 2 \cdot \text{PolyLog}[2, (b \cdot (c + dx)) / (bc - ad)])) / b^2 + (2c^3 \cdot (2bc - 2ad + 2b \cdot (c + dx) \cdot \text{Log}[a + bx] - 2 \cdot (bc - ad) \cdot \text{Log}[(a + bx)/(c + dx)] - 2b \cdot (c + dx) \cdot \text{Log}[a + bx] \cdot \text{Log}[(a + bx)/(c + dx)] - 2b \cdot (c + dx) \cdot \text{Log}[c + dx] - 2b \cdot (c + dx) \cdot \text{Log}[(a + bx)/(c + dx)] \cdot \text{Log}[(bc - ad)/(bc + bdx)] + b \cdot (c + dx) \cdot (\text{Log}[a + bx] \cdot (\text{Log}[a + bx] - 2 \cdot \text{Log}[(b \cdot (c + dx)) / (bc - ad)]))
\end{aligned}$$



$$\begin{aligned}
& - a*d)) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-(b*c) + a*d)] + b*(c + d*x)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])))/((b*c - a*d)*(c + d*x)) + (4*c*(b*c - a*d)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - 2*Log[(a + b*x)/(c + d*x)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]))/b - 12*c^2*(Log[(a + b*x)/(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/((2*d^4*i^2) + (3*a^2*b*B^2*g^3*n^2*((c*Log[(a + b*x)/(c + d*x)]^2)/(c + d*x) - Log[(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] - 2*Log[(a + b*x)/(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] + (c*(2*b*c - 2*a*d + 2*b*(c + d*x)*Log[a + b*x] - 2*(b*c - a*d)*Log[(a + b*x)/(c + d*x)] - 2*b*(c + d*x)*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] - 2*b*(c + d*x)*Log[c + d*x] - 2*b*(c + d*x)*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c + b*d*x)] + b*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-(b*c) + a*d)] + b*(c + d*x)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])))/((b*c - a*d)*(c + d*x)) + 2*\text{PolyLog}[3, (d*(a + b*x))/(b*(c + d*x))])/((d^2*i^2)
\end{aligned}$$

**Maple [F]** time = 0.715, size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^3}{(dix + ci)^2} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i)^2,x)

[Out] int((b\*g\*x+a\*g)^3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i)^2,x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i)^2,x, algorithm="maxima")

```
[Out] 2*A*B*a^3*g^3*n*(1/(d^2*i^2*x + c*d*i^2) + b*log(b*x + a)/((b*c*d - a*d^2)*
i^2) - b*log(d*x + c)/((b*c*d - a*d^2)*i^2)) + 1/2*(2*c^3/(d^5*i^2*x + c*d^
4*i^2) + 6*c^2*log(d*x + c)/(d^4*i^2) + (d*x^2 - 4*c*x)/(d^3*i^2))*A^2*b^3*
g^3 - 3*A^2*a*b^2*(c^2/(d^4*i^2*x + c*d^3*i^2) - x/(d^2*i^2) + 2*c*log(d*x
+ c)/(d^3*i^2))*g^3 + 3*A^2*a^2*b*g^3*(c/(d^3*i^2*x + c*d^2*i^2) + log(d*x
+ c)/(d^2*i^2)) - 2*A*B*a^3*g^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(d^2
*i^2*x + c*d*i^2) - A^2*a^3*g^3/(d^2*i^2*x + c*d*i^2) + 1/2*(B^2*b^3*d^3*g^
3*x^3 - 3*(b^3*c*d^2*g^3 - 2*a*b^2*d^3*g^3)*B^2*x^2 - 2*(2*b^3*c^2*d*g^3 -
3*a*b^2*c*d^2*g^3)*B^2*x + 2*(b^3*c^3*g^3 - 3*a*b^2*c^2*d*g^3 + 3*a^2*b*c*d
^2*g^3 - a^3*d^3*g^3)*B^2 + 6*((b^3*c^2*d*g^3 - 2*a*b^2*c*d^2*g^3 + a^2*b*d
^3*g^3)*B^2*x + (b^3*c^3*g^3 - 2*a*b^2*c^2*d*g^3 + a^2*b*c*d^2*g^3)*B^2)*lo
g(d*x + c))*log((d*x + c)^n)^2/(d^5*i^2*x + c*d^4*i^2) - integrate(-(B^2*a^
3*d^3*g^3*log(e)^2 + (B^2*b^3*d^3*g^3*log(e)^2 + 2*A*B*b^3*d^3*g^3*log(e))*
x^3 + 3*(B^2*a*b^2*d^3*g^3*log(e)^2 + 2*A*B*a*b^2*d^3*g^3*log(e))*x^2 + (B^
2*b^3*d^3*g^3*x^3 + 3*B^2*a*b^2*d^3*g^3*x^2 + 3*B^2*a^2*b*d^3*g^3*x + B^2*a
^3*d^3*g^3)*log((b*x + a)^n)^2 + 3*(B^2*a^2*b*d^3*g^3*log(e)^2 + 2*A*B*a^2*
b*d^3*g^3*log(e))*x + 2*(B^2*a^3*d^3*g^3*log(e) + (B^2*b^3*d^3*g^3*log(e) +
A*B*b^3*d^3*g^3)*x^3 + 3*(B^2*a*b^2*d^3*g^3*log(e) + A*B*a*b^2*d^3*g^3)*x^
2 + 3*(B^2*a^2*b*d^3*g^3*log(e) + A*B*a^2*b*d^3*g^3)*x)*log((b*x + a)^n) -
((2*A*B*b^3*d^3*g^3 + (g^3*n + 2*g^3*log(e))*B^2*b^3*d^3)*x^3 + 2*(b^3*c^3*
g^3*n - 3*a*b^2*c^2*d*g^3*n + 3*a^2*b*c*d^2*g^3*n - (g^3*n - g^3*log(e))*a^
3*d^3)*B^2 + 3*(2*A*B*a*b^2*d^3*g^3 - (b^3*c*d^2*g^3*n - 2*(g^3*n + g^3*log
(e))*a*b^2*d^3)*B^2)*x^2 + 2*(3*A*B*a^2*b*d^3*g^3 - (2*b^3*c^2*d*g^3*n - 3*
a*b^2*c*d^2*g^3*n - 3*a^2*b*d^3*g^3*log(e))*B^2)*x + 6*((b^3*c^2*d*g^3*n -
2*a*b^2*c*d^2*g^3*n + a^2*b*d^3*g^3*n)*B^2*x + (b^3*c^3*g^3*n - 2*a*b^2*c^2
*d*g^3*n + a^2*b*c*d^2*g^3*n)*B^2)*log(d*x + c) + 2*(B^2*b^3*d^3*g^3*x^3 +
3*B^2*a*b^2*d^3*g^3*x^2 + 3*B^2*a^2*b*d^3*g^3*x + B^2*a^3*d^3*g^3)*log((b*x
+ a)^n))*log((d*x + c)^n))/(d^5*i^2*x^2 + 2*c*d^4*i^2*x + c^2*d^3*i^2), x
```

---

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{A^2 b^3 g^3 x^3 + 3 A^2 a b^2 g^3 x^2 + 3 A^2 a^2 b g^3 x + A^2 a^3 g^3 + (B^2 b^3 g^3 x^3 + 3 B^2 a b^2 g^3 x^2 + 3 B^2 a^2 b g^3 x + B^2 a^3 g^3) \log \left( e \left( \frac{b}{d} \right) \right)}{d^2 i^2 x^2 + 2 c d i^2 x + c^2 i^2} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x,
algorithm="fricas")
```

```
[Out] integral((A^2*b^3*g^3*x^3 + 3*A^2*a*b^2*g^3*x^2 + 3*A^2*a^2*b*g^3*x + A^2*a
```

$$\begin{aligned} &^3g^3 + (B^2b^3g^3x^3 + 3B^2a^2b^2g^3x^2 + 3B^2a^2b^2g^3x + B^2a^3g^3) \log(e((bx+a)/(dx+c))^n)^2 + 2(A*B*b^3g^3x^3 + 3A*B*a^2b^2g^3x^2 + 3A*B*a^2b^2g^3x + A*B*a^3g^3) \log(e((bx+a)/(dx+c))^n) \\ &/ (d^2i^2x^2 + 2c*d*i^2x + c^2i^2), x \end{aligned}$$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*\*3\*(A+B\*ln(e((b\*x+a)/(d\*x+c))\*\*n))\*\*2/(d\*i\*x+c\*i)\*\*2, x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^3 \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2}{(dix + ci)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(A+B\*log(e((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i)^2, x, algorithm="giac")

[Out] integrate((b\*g\*x + a\*g)^3\*(B\*log(e((b\*x + a)/(d\*x + c))^n) + A)^2/(d\*i\*x + c\*i)^2, x)

$$3.195 \quad \int \frac{(ag+bgx)^2 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ci+dix)^2} dx$$

**Optimal.** Leaf size=500

$$\frac{4bB^2g^2n(bc-ad)\text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{d^3i^2} + \frac{2bB^2g^2n^2(bc-ad)\text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)}{d^3i^2} - \frac{4bB^2g^2n^2(bc-ad)\text{PolyLog}\left(3, \frac{d(a+bx)}{b(c+dx)}\right)}{d^3i^2}$$

```
[Out] (-2*A*B*(b*c - a*d)*g^2*n*(a + b*x))/(d^2*i^2*(c + d*x)) + (2*B^2*(b*c - a*d)*g^2*n^2*(a + b*x))/(d^2*i^2*(c + d*x)) - (2*B^2*(b*c - a*d)*g^2*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(d^2*i^2*(c + d*x)) + (b*g^2*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(d^2*i^2) + ((b*c - a*d)*g^2*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(d^2*i^2*(c + d*x)) + (2*b*B*(b*c - a*d)*g^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(d^3*i^2) + (2*b*(b*c - a*d)*g^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[(b*c - a*d)/(b*(c + d*x))])/(d^3*i^2) + (2*b*B^2*(b*c - a*d)*g^2*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i^2) + (4*b*B*(b*c - a*d)*g^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i^2) - (4*b*B^2*(b*c - a*d)*g^2*n^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i^2)
```

**Rubi [B]** time = 4.98144, antiderivative size = 1807, normalized size of antiderivative = 3.61, number of steps used = 89, number of rules used = 26, integrand size = 45,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.578$ , Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 44, 6688, 6742, 2500, 2433, 2375, 2317, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i + d*i*x)^2,x]
```

```
[Out] (-2*B^2*(b*c - a*d)^2*g^2*n^2)/(d^3*i^2*(c + d*x)) - (2*b*B^2*(b*c - a*d)*g^2*n^2*Log[a + b*x])/(d^3*i^2) - (a*b*B^2*g^2*n^2*Log[a + b*x]^2)/(d^2*i^2) - (b*B^2*(b*c - a*d)*g^2*n^2*Log[a + b*x]^2)/(d^3*i^2) + (2*B*(b*c - a*d)^2*g^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(d^3*i^2*(c + d*x)) + (2*a*b*B*g^2*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(d^2*i^2) + (2*b*B*(b*c - a*d)*g^2*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
```

$$\begin{aligned}
& )/(d^3i^2) + (b^2g^2x*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(d^2i^2) - ((b*c - a*d)^2g^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(d^3i^2*(c + d*x)) + (2*b*B^2*(b*c - a*d)*g^2n^2*Log[c + d*x])/(d^3i^2) + (4*A*b*B*(b*c - a*d)*g^2n*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d^3i^2) + (2*b^2*B^2*c*g^2n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d^3i^2) + (2*b*B^2*(b*c - a*d)*g^2n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d^3i^2) + (2*b*B^2*(b*c - a*d)*g^2*Log[(a + b*x)^n]^2*Log[c + d*x])/(d^3i^2) - (2*b^2*B*c*g^2n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) *Log[c + d*x])/(d^3i^2) - (2*b*B*(b*c - a*d)*g^2n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) *Log[c + d*x])/(d^3i^2) - (2*b*(b*c - a*d)*g^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[c + d*x])/(d^3i^2) - (2*A*b*B*(b*c - a*d)*g^2n*Log[c + d*x]^2)/(d^3i^2) - (b^2*B^2*c*g^2n^2*Log[c + d*x]^2)/(d^3i^2) + (2*b*B^2*(b*c - a*d)*g^2n^2*Log[a + b*x]*Log[c + d*x]^2)/(d^3i^2) - (2*b*B^2*(b*c - a*d)*g^2n*Log[e*((a + b*x)/(c + d*x))^n]*Log[c + d*x]^2)/(d^3i^2) - (2*b*B^2*(b*c - a*d)*g^2n^2*Log[c + d*x]^3)/(3*d^3i^2) + (2*a*b*B^2*g^2n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(d^2i^2) + (2*b*B^2*(b*c - a*d)*g^2n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(d^3i^2) - (2*b*B^2*(b*c - a*d)*g^2*Log[(a + b*x)^n]^2*Log[(b*(c + d*x))/(b*c - a*d)])/(d^3i^2) + (4*b*B^2*(b*c - a*d)*g^2n*Log[a + b*x]*Log[c + d*x]*Log[(c + d*x)^(-n)])/(d^3i^2) + (2*b*B^2*(b*c - a*d)*g^2*Log[a + b*x]*Log[(c + d*x)^(-n)]^2)/(d^3i^2) - (2*b*B^2*(b*c - a*d)*g^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^(-n)]^2)/(d^3i^2) - (4*b*B^2*(b*c - a*d)*g^2n*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x]*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)]))/(d^3i^2) + (2*a*b*B^2*g^2n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(d^2i^2) + (2*b*B^2*(b*c - a*d)*g^2n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(d^3i^2) - (4*b*B^2*(b*c - a*d)*g^2n*Log[(a + b*x)^n]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(d^3i^2) + (4*A*b*B*(b*c - a*d)*g^2n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^3i^2) + (2*b^2*B^2*c*g^2n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^3i^2) + (2*b*B^2*(b*c - a*d)*g^2n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^3i^2) + (4*b*B^2*(b*c - a*d)*g^2n*Log[(c + d*x)^(-n)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^3i^2) - (4*b*B^2*(b*c - a*d)*g^2n*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)])*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^3i^2) + (4*b*B^2*(b*c - a*d)*g^2n^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])/(d^3i^2) + (4*b*B^2*(b*c - a*d)*g^2n^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])/(d^3i^2)
\end{aligned}$$

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^n, x_Symbol] := Simp[x*(a +
  b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
  RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, p}, x] && Rat
  ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
  Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^n/((d_.) + (e_.)*(x_)), x_S
  ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
  , Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x] /;
  FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^n]*(b_.))^p*(RFx_), x_Sy
  mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
  Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
  RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^n]*(b_.))^p*((f_) + (g_.
  )*(x_))^q, x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
  n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
  qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^n]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
  g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^n]*(b_.))/((f_.) + (g_.)*(x_
  )), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
  )^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
  , x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_)^(m_.
)), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_)^(m_.))*((c_.) + (d_.)*(x_)^(n_.)), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 6688

```
Int[u_, x_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_)^(p_.))*((c_.) + (d_.)*(x_)^(q_.)
)^(r_.)]*(s_.) + Log[(i_.)*((g_.) + (h_.)*(x_)^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] := Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
```

$\cdot x), x] + \text{Int}[(\text{Log}[(c + d \cdot x)^{(q \cdot r)}] \cdot (s + t \cdot \text{Log}[i \cdot (g + h \cdot x)^n])) / (j + k \cdot x), x] /;$  FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0]

### Rule 2433

$\text{Int}[(a + \text{Log}[c \cdot (d + (e \cdot x)^n)] \cdot (b))^{(p)} \cdot ((f + \text{Log}[(h \cdot (i + (j \cdot x)^m)] \cdot (g)) \cdot ((k + (l \cdot x)^r)), x_{\text{Symbol}}] \rightarrow \text{Dist}[1/e, \text{Subst}[\text{Int}[(k \cdot x)/d]^r \cdot (a + b \cdot \text{Log}[c \cdot x^n])^p \cdot (f + g \cdot \text{Log}[h \cdot (e \cdot i - d \cdot j)/e + (j \cdot x)/e]^m), x], x, d + e \cdot x], x] /;$  FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e\*k - d\*1, 0]

### Rule 2375

$\text{Int}[(\text{Log}[d \cdot (e + (f \cdot x)^m)]^{(r)} \cdot (a + \text{Log}[c \cdot (x)^n])^{(p)}) / (x), x_{\text{Symbol}}] \rightarrow \text{Simp}[(\text{Log}[d \cdot (e + f \cdot x^m)]^r \cdot (a + b \cdot \text{Log}[c \cdot x^n])^{(p+1)}) / (b \cdot n \cdot (p+1)), x] - \text{Dist}[(f \cdot m \cdot r) / (b \cdot n \cdot (p+1)), \text{Int}[(x^{(m-1)} \cdot (a + b \cdot \text{Log}[c \cdot x^n])^{(p+1)}) / (e + f \cdot x^m), x], x] /;$  FreeQ[{a, b, c, d, e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d\*e, 1]

### Rule 2317

$\text{Int}[(a + \text{Log}[c \cdot (x)^n] \cdot (b))^{(p)} / ((d + (e \cdot x)), x_{\text{Symbol}}] \rightarrow \text{Simp}[(\text{Log}[1 + (e \cdot x)/d] \cdot (a + b \cdot \text{Log}[c \cdot x^n])^p) / e, x] - \text{Dist}[(b \cdot n \cdot p) / e, \text{Int}[(\text{Log}[1 + (e \cdot x)/d] \cdot (a + b \cdot \text{Log}[c \cdot x^n])^{(p-1)}) / x, x], x] /;$  FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

### Rule 2374

$\text{Int}[(\text{Log}[d \cdot (e + (f \cdot x)^m)] \cdot (a + \text{Log}[c \cdot (x)^n]) \cdot (b))^{(p)} / (x), x_{\text{Symbol}}] \rightarrow -\text{Simp}[(\text{PolyLog}[2, -(d \cdot f \cdot x^m)] \cdot (a + b \cdot \text{Log}[c \cdot x^n])^p) / m, x] + \text{Dist}[(b \cdot n \cdot p) / m, \text{Int}[(\text{PolyLog}[2, -(d \cdot f \cdot x^m)] \cdot (a + b \cdot \text{Log}[c \cdot x^n])^{(p-1)}) / x, x], x] /;$  FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0] && EqQ[d\*e, 1]

### Rule 6589

$\text{Int}[\text{PolyLog}[n, c \cdot (a + (b \cdot x)^p)] / ((d + (e \cdot x)), x_{\text{Symbol}}] \rightarrow \text{Simp}[\text{PolyLog}[n + 1, c \cdot (a + b \cdot x)^p] / (e \cdot p), x] /;$  FreeQ[{a, b, c, d, e, n, p}, x] && EqQ[b\*d, a\*e]

### Rule 2440

$\text{Int}[(a + \text{Log}[c \cdot (d + (e \cdot x)^n)] \cdot (b)) \cdot ((f + \text{Log}[(h \cdot (i + (j \cdot x)^m)] \cdot (g)) \cdot ((k + (l \cdot x)^r)), x_{\text{Symbol}}] \rightarrow$



Dist[1/l, Subst[Int[x^r\*(a + b\*Log[c\*(-((e\*k - d\*l)/l) + (e\*x)/l)^n])\*(f + g\*Log[h\*(-((j\*k - i\*l)/l) + (j\*x)/l)^m]), x], x, k + l\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]

### Rule 2434

Int[(((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))\*((f\_.) + Log[(h\_.)\*(i\_.) + (j\_.)\*(x\_)]^(m\_.)]\*(g\_.))/(x\_), x\_Symbol] :> Simp[Log[x]\*(a + b\*Log[c\*(d + e\*x)^n])\*(f + g\*Log[h\*(i + j\*x)^m]), x] + (-Dist[e\*g\*m, Int[(Log[x]\*(a + b\*Log[c\*(d + e\*x)^n])]/(d + e\*x), x], x] - Dist[b\*j\*n, Int[(Log[x]\*(f + g\*Log[h\*(i + j\*x)^m])]/(i + j\*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, m, n}, x] && EqQ[e\*i - d\*j, 0]

### Rule 2499

Int[(Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.))]^(r\_.)]\*(s\_.) + Log[(i\_.)\*((g\_.) + (h\_.)\*(x\_))^(n\_.)]\*(t\_.)]^(m\_.))/(j\_.) + (k\_.)\*(x\_)), x\_Symbol] :> Simp[((s + t\*Log[i\*(g + h\*x)^n])^(m + 1)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r)]/(k\*n\*t\*(m + 1)), x] + (-Dist[(b\*p\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(a + b\*x), x], x] - Dist[(d\*q\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(c + d\*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0] && EqQ[h\*j - g\*k, 0] && IGtQ[m, 0]

### Rule 2396

Int[(((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))]^(p\_)/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :> Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])^p)/g, x] - Dist[(b\*e\*n\*p)/g, Int[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])^(p - 1))/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p}, x] && NeQ[e\*f - d\*g, 0] && IGtQ[p, 1]

### Rule 2302

Int[(((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))]^(p\_)/(x\_), x\_Symbol] :> Dist[1/(b\*n), Subst[Int[x^p, x], x, a + b\*Log[c\*x^n]], x] /; FreeQ[{a, b, c, n, p}, x]

### Rule 30

Int[(x\_)^(m\_.), x\_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && NeQ[m, -1]

### Rubi steps

$$\begin{aligned}
\int \frac{(ag + bgx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(195c + 195dx)^2} dx &= \int \left( \frac{b^2 g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{38025d^2} + \frac{(-bc + ad)^2 g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{38025d^2(c + dx)^2} \right) dx \\
&= \frac{(b^2 g^2) \int \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx}{38025d^2} - \frac{(2b(bc - ad)g^2) \int \frac{\left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{c+dx} dx}{38025d^2} \\
&= \frac{b^2 g^2 x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{38025d^2} - \frac{(bc - ad)^2 g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{38025d^3(c + dx)} \\
&= \frac{b^2 g^2 x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{38025d^2} - \frac{(bc - ad)^2 g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{38025d^3(c + dx)} \\
&= \frac{b^2 g^2 x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{38025d^2} - \frac{(bc - ad)^2 g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{38025d^3(c + dx)} \\
&= \frac{b^2 g^2 x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{38025d^2} - \frac{(bc - ad)^2 g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{38025d^3(c + dx)} \\
&= \frac{2B(bc - ad)^2 g^2 n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{38025d^3(c + dx)} + \frac{2abB g^2 n \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{38025d^2} \\
&= \frac{2B(bc - ad)^2 g^2 n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{38025d^3(c + dx)} + \frac{2abB g^2 n \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{38025d^2} \\
&= \frac{2B(bc - ad)^2 g^2 n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{38025d^3(c + dx)} + \frac{2abB g^2 n \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{38025d^2} \\
&= \frac{2B^2(bc - ad)^2 g^2 n^2}{38025d^3(c + dx)} - \frac{2bB^2(bc - ad)g^2 n^2 \log(a + bx)}{38025d^3} + \frac{2B(bc - ad)^2 g^2 n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{38025d^3} \\
&= \frac{2B^2(bc - ad)^2 g^2 n^2}{38025d^3(c + dx)} - \frac{2bB^2(bc - ad)g^2 n^2 \log(a + bx)}{38025d^3} - \frac{abB^2 g^2 n^2 \log^2(a + bx)}{38025d^2} \\
&= \frac{2B^2(bc - ad)^2 g^2 n^2}{38025d^3(c + dx)} - \frac{2bB^2(bc - ad)g^2 n^2 \log(a + bx)}{38025d^3} - \frac{abB^2 g^2 n^2 \log^2(a + bx)}{38025d^2}
\end{aligned}$$

**Mathematica [B]** time = 6.12345, size = 2196, normalized size = 4.39

Result too large to show

Antiderivative was successfully verified.

[In] Integrate[((a\*g + b\*g\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(c\*i + d\*i\*x)^2,x]

[Out]  $(g^2(b^2d^2x^2(A + B\log[e((a + b*x)/(c + d*x))^n] - B^n\log[(a + b*x)/(c + d*x]))^2 - ((b*c - a*d)^2(A + B\log[e((a + b*x)/(c + d*x))^n] - B^n\log[(a + b*x)/(c + d*x]))^2)/(c + d*x) - 2*b*(b*c - a*d)*(A + B\log[e((a + b*x)/(c + d*x))^n] - B^n\log[(a + b*x)/(c + d*x]))^2\log[c + d*x] + (2*a^2*B*d^2*n*(-A - B\log[e((a + b*x)/(c + d*x))^n] + B^n\log[(a + b*x)/(c + d*x]))*(b*c - a*d + b*(c + d*x)*\log[a/b + x] + (-b*c) + a*d)*\log[(a + b*x)/(c + d*x)] - b*c*\log[(b*(c + d*x))/(b*c - a*d)] - b*d*x*\log[(b*(c + d*x))/(b*c - a*d)))/((-b*c) + a*d)*(c + d*x) + 2*a*b*B*d^n*(A + B\log[e((a + b*x)/(c + d*x))^n] - B^n\log[(a + b*x)/(c + d*x)])*(-\log[c/d + x]^2 + 2*\log[c/d + x]*\log[c + d*x] + 2*(-c/(c + d*x)) + (b*c*\log[a + b*x])/(-b*c) + a*d) + (b*c*\log[c + d*x))/(b*c - a*d) - \log[a/b + x]*\log[c + d*x] + \log[(a + b*x)/(c + d*x)]*(c/(c + d*x) + \log[c + d*x]) + \log[a/b + x]*\log[(b*(c + d*x))/(b*c - a*d)] + 2*\text{PolyLog}[2, (d*(a + b*x))/(-b*c) + a*d]) + 2*b^2*B^n*(A + B\log[e((a + b*x)/(c + d*x))^n] - B^n\log[(a + b*x)/(c + d*x)])*(d*(a/b + x)*(-1 + \log[a/b + x]) - (c^2*\log[a/b + x])/(c + d*x) - (c + d*x)*(-1 + \log[c/d + x]) + c*\log[c/d + x]^2 + (c^2*(1 + \log[c/d + x]))/(c + d*x) + (b*c^2*(\log[a + b*x] - \log[c + d*x]))/(b*c - a*d) + (-\log[a/b + x] + \log[c/d + x] + \log[(a + b*x)/(c + d*x)])*(d*x - c^2/(c + d*x) - 2*c*\log[c + d*x]) - 2*c*(\log[a/b + x]*\log[(b*(c + d*x))/(b*c - a*d)] + \text{PolyLog}[2, (d*(a + b*x))/(-b*c) + a*d])) - (a^2*B^2*d^2*n^2*(2*b*c - 2*a*d + 2*b*(c + d*x)*\log[a + b*x] - 2*(b*c - a*d)*\log[(a + b*x)/(c + d*x)] - 2*b*(c + d*x)*\log[a + b*x]*\log[(a + b*x)/(c + d*x)] + (b*c - a*d)*\log[(a + b*x)/(c + d*x)]^2 - 2*b*(c + d*x)*\log[c + d*x] - 2*b*(c + d*x)*\log[(a + b*x)/(c + d*x)]*\log[(b*c - a*d)/(b*c + b*d*x)] + b*(c + d*x)*(\log[a + b*x]*(\log[a + b*x] - 2*\log[(b*(c + d*x))/(b*c - a*d)]) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-b*c) + a*d]) + b*(c + d*x)*(\log[(b*c - a*d)/(b*c + b*d*x)]*(2*\log[(d*(a + b*x))/(-b*c) + a*d]) + \log[(b*c - a*d)/(b*c + b*d*x)]) - 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]))/((b*c - a*d)*(c + d*x)) + b^2*B^2*n^2*((d*(a + b*x)*\log[(a + b*x)/(c + d*x)]^2)/b - (c^2*\log[(a + b*x)/(c + d*x)]^2)/(c + d*x) + 2*c*\log[(a + b*x)/(c + d*x)]^2*\log[(b*c - a*d)/(b*c + b*d*x)] - (c^2*(2*b*c - 2*a*d + 2*b*(c + d*x)*\log[a + b*x] - 2*(b*c - a*d)*\log[(a + b*x)/(c + d*x)] - 2*b*(c + d*x)*\log[a + b*x]*\log[(a + b*x)/(c + d*x)] - 2*b*(c + d*x)*\log[c + d*x] - 2*b*(c + d*x)*\log[(a + b*x)/(c + d*x)]*\log[(b*c - a*d)/(b*c + b*d*x)] + b*(c + d*x)*(\log[a + b*x]*(\log[a + b*x] - 2*\log[(b*(c + d*x))/(b*c - a*d)]) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-b*c) + a*d])) + b*(c + d*x)*(\log[(b*c - a*d)/(b*c$

$$\begin{aligned}
& + b*d*x)]*(2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] + \text{Log}[(b*c - a*d)/(b*c + b* \\
& d*x)]) - 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)))/((b*c - a*d)*(c + d*x)) \\
& - ((b*c - a*d)*(\text{Log}[(b*c - a*d)/(b*c + b*d*x)]*(2*\text{Log}[(d*(a + b*x))/(-(b*c) \\
& ) + a*d)] - 2*\text{Log}[(a + b*x)/(c + d*x)] + \text{Log}[(b*c - a*d)/(b*c + b*d*x)]) - \\
& 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)))/b + 4*c*(\text{Log}[(a + b*x)/(c + d*x)] \\
& *\text{PolyLog}[2, (d*(a + b*x))/(b*(c + d*x))] - \text{PolyLog}[3, (d*(a + b*x))/(b*(c + \\
& d*x))])) + 2*a*b*B^2*d*n^2*((c*\text{Log}[(a + b*x)/(c + d*x)]^2)/(c + d*x) - \text{Log} \\
& [(a + b*x)/(c + d*x)]^2*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] - 2*\text{Log}[(a + b*x)/(c \\
& + d*x)]*\text{PolyLog}[2, (d*(a + b*x))/(b*(c + d*x))] + (c*(2*b*c - 2*a*d + 2*b* \\
& (c + d*x)*\text{Log}[a + b*x] - 2*(b*c - a*d)*\text{Log}[(a + b*x)/(c + d*x)] - 2*b*(c + \\
& d*x)*\text{Log}[a + b*x]*\text{Log}[(a + b*x)/(c + d*x)] - 2*b*(c + d*x)*\text{Log}[c + d*x] - 2 \\
& *b*(c + d*x)*\text{Log}[(a + b*x)/(c + d*x)]*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] + b*(c \\
& + d*x)*(\text{Log}[a + b*x]*(\text{Log}[a + b*x] - 2*\text{Log}[(b*(c + d*x))/(b*c - a*d)])) - 2 \\
& *\text{PolyLog}[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*(c + d*x)*(\text{Log}[(b*c - a*d)/( \\
& b*c + b*d*x)]*(2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] + \text{Log}[(b*c - a*d)/(b*c + \\
& b*d*x)]) - 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)))/((b*c - a*d)*(c + d* \\
& x)) + 2*\text{PolyLog}[3, (d*(a + b*x))/(b*(c + d*x)))])))/(d^3*i^2)
\end{aligned}$$

**Maple [F]** time = 0.698, size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^2}{(dix + ci)^2} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i)^2,x)

[Out] int((b\*g\*x+a\*g)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i)^2,x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i)^2,x, algorithm="maxima")

[Out] 2\*A\*B\*a^2\*g^2\*n\*(1/(d^2\*i^2\*x + c\*d\*i^2) + b\*log(b\*x + a)/((b\*c\*d - a\*d^2)\*i^2) - b\*log(d\*x + c)/((b\*c\*d - a\*d^2)\*i^2)) - A^2\*b^2\*(c^2/(d^4\*i^2\*x + c\*

$$d^3i^2) - x/(d^2i^2) + 2*c*log(dx + c)/(d^3i^2))*g^2 + 2*A^2*a*b*g^2*(c/(d^3i^2*x + c*d^2i^2) + log(dx + c)/(d^2i^2)) - 2*A*B*a^2*g^2*log(e*(b*x/(dx + c) + a/(dx + c))^n)/(d^2i^2*x + c*d^2i^2) - A^2*a^2*g^2/(d^2i^2*x + c*d^2i^2) + (B^2*b^2*d^2*g^2*x^2 + B^2*b^2*c*d*g^2*x - (b^2*c^2*g^2 - 2*a*b*c*d*g^2 + a^2*d^2*g^2)*B^2 - 2*((b^2*c*d*g^2 - a*b*d^2*g^2)*B^2*x + (b^2*c^2*g^2 - a*b*c*d*g^2)*B^2)*log(dx + c))*log((dx + c)^n)^2/(d^4i^2*x + c*d^3i^2) - integrate(-(B^2*a^2*d^2*g^2*log(e)^2 + (B^2*b^2*d^2*g^2*log(e))^2 + 2*A*B*b^2*d^2*g^2*log(e))*x^2 + (B^2*b^2*d^2*g^2*x^2 + 2*B^2*a*b*d^2*g^2*x + B^2*a^2*d^2*g^2)*log((b*x + a)^n)^2 + 2*(B^2*a*b*d^2*g^2*log(e)^2 + 2*A*B*a*b*d^2*g^2*log(e))*x + 2*(B^2*a^2*d^2*g^2*log(e) + (B^2*b^2*d^2*g^2*log(e) + A*B*b^2*d^2*g^2)*x^2 + 2*(B^2*a*b*d^2*g^2*log(e) + A*B*a*b*d^2*g^2)*x)*log((b*x + a)^n) + 2*((b^2*c^2*g^2*n - 2*a*b*c*d*g^2*n + (g^2*n - g^2*log(e))*a^2*d^2)*B^2 - (A*B*b^2*d^2*g^2 + (g^2*n + g^2*log(e))*B^2*b^2*d^2)*x^2 - (2*A*B*a*b*d^2*g^2 + (b^2*c*d*g^2*n + 2*a*b*d^2*g^2*log(e))*B^2)*x + 2*((b^2*c*d*g^2*n - a*b*d^2*g^2*n)*B^2*x + (b^2*c^2*g^2*n - a*b*c*d*g^2*n)*B^2)*log(dx + c) - (B^2*b^2*d^2*g^2*x^2 + 2*B^2*a*b*d^2*g^2*x + B^2*a^2*d^2*g^2)*log((b*x + a)^n))*log((dx + c)^n))/(d^4i^2*x^2 + 2*c*d^3i^2*x + c^2*d^2i^2), x)$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{A^2b^2g^2x^2 + 2A^2abg^2x + A^2a^2g^2 + (B^2b^2g^2x^2 + 2B^2abg^2x + B^2a^2g^2) \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right)^2 + 2(ABb^2g^2x^2 + 2ABa^2g^2x + ABa^2g^2) \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right)}{d^2i^2x^2 + 2cdi^2x + c^2i^2} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i)^2,x, algorithm="fricas")

[Out] integral((A^2\*b^2\*g^2\*x^2 + 2\*A^2\*a\*b\*g^2\*x + A^2\*a^2\*g^2 + (B^2\*b^2\*g^2\*x^2 + 2\*B^2\*a\*b\*g^2\*x + B^2\*a^2\*g^2)\*log(e\*((b\*x + a)/(d\*x + c))^n)^2 + 2\*(A\*B\*b^2\*g^2\*x^2 + 2\*A\*B\*a\*b\*g^2\*x + A\*B\*a^2\*g^2)\*log(e\*((b\*x + a)/(d\*x + c))^n))/(d^2\*i^2\*x^2 + 2\*c\*d\*i^2\*x + c^2\*i^2), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*i*x+c*i)**2, x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^2 \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2}{(dix + ci)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2, x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(d*i*x + c*i)^2, x)
```

$$3.196 \quad \int \frac{(ag+bgx) \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ci+dix)^2} dx$$

**Optimal.** Leaf size=282

$$\frac{2bBgn \text{PolyLog} \left( 2, \frac{d(a+bx)}{b(c+dx)} \right) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{d^2 i^2} + \frac{2bB^2gn^2 \text{PolyLog} \left( 3, \frac{d(a+bx)}{b(c+dx)} \right)}{d^2 i^2} - \frac{bg \log \left( \frac{bc-ad}{b(c+dx)} \right) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{d^2 i^2}$$

[Out]  $(2*A*B*g*n*(a + b*x))/(d*i^2*(c + d*x)) - (2*B^2*g*n^2*(a + b*x))/(d*i^2*(c + d*x)) + (2*B^2*g*n*(a + b*x)*\text{Log}[e*((a + b*x)/(c + d*x))^n])/(d*i^2*(c + d*x)) - (g*(a + b*x)*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2)/(d*i^2*(c + d*x)) - (b*g*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2*\text{Log}[(b*c - a*d)/(b*(c + d*x))])/(d^2*i^2) - (2*b*B*g*n*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])* \text{PolyLog}[2, (d*(a + b*x))/(b*(c + d*x))])/(d^2*i^2) + (2*b*B^2*g*n^2*\text{PolyLog}[3, (d*(a + b*x))/(b*(c + d*x))])/(d^2*i^2)$

**Rubi [B]** time = 4.17219, antiderivative size = 1157, normalized size of antiderivative = 4.1, number of steps used = 69, number of rules used = 25, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.581$ , Rules used = {2528, 2525, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 44, 6688, 6742, 2500, 2433, 2375, 2317, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

$$\frac{bB^2gn^2 \log^3(c+dx)}{3d^2i^2} + \frac{bB^2gn^2 \log^2(c+dx)}{d^2i^2} + \frac{AbBgn \log^2(c+dx)}{d^2i^2} - \frac{bB^2gn^2 \log(a+bx) \log^2(c+dx)}{d^2i^2} + \frac{bB^2gn \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{d^2i^2}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[\left( (a*g + b*g*x)*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2 \right)/(c*i + d*i*x)^2, x]$

[Out]  $(2*B^2*(b*c - a*d)*g*n^2)/(d^2*i^2*(c + d*x)) + (2*b*B^2*g*n^2*\text{Log}[a + b*x])/(d^2*i^2) + (b*B^2*g*n^2*\text{Log}[a + b*x]^2)/(d^2*i^2) - (2*B*(b*c - a*d)*g*n*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]))/(d^2*i^2*(c + d*x)) - (2*b*B*g*n*\text{Log}[a + b*x]*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]))/(d^2*i^2) + ((b*c - a*d)*g*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2)/(d^2*i^2*(c + d*x)) - (2*b*B^2*g*n^2*\text{Log}[c + d*x])/(d^2*i^2) - (2*A*b*B*g*n*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/(d^2*i^2) - (2*b*B^2*g*n^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/(d^2*i^2) - (b*B^2*g*\text{Log}[(a + b*x)^n]^2*\text{Log}[c + d*x])/(d^2*i^2) + (2*b*B*g*n*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])*\text{Log}[c + d*x])/(d^2*i^2)$

$$\begin{aligned}
& (d^2 i^2) + (b * g * (A + B * \text{Log}[e * ((a + b * x) / (c + d * x))^n])^2 * \text{Log}[c + d * x]) / (d^2 i^2) \\
& + (A * b * B * g * n * \text{Log}[c + d * x]^2) / (d^2 i^2) + (b * B^2 * g * n^2 * \text{Log}[c + d * x]^2) / (d^2 i^2) \\
& - (b * B^2 * g * n^2 * \text{Log}[a + b * x] * \text{Log}[c + d * x]^2) / (d^2 i^2) + (b * B^2 * g * n^2 * \text{Log}[e * ((a + b * x) / (c + d * x))^n] * \text{Log}[c + d * x]^2) / (d^2 i^2) \\
& + (b * B^2 * g * n^2 * \text{Log}[c + d * x]^3) / (3 * d^2 i^2) - (2 * b * B^2 * g * n^2 * \text{Log}[a + b * x] * \text{Log}[(b * (c + d * x)) / (b * c - a * d)]) / (d^2 i^2) \\
& + (b * B^2 * g * \text{Log}[(a + b * x)^n]^2 * \text{Log}[(b * (c + d * x)) / (b * c - a * d)]) / (d^2 i^2) - (2 * b * B^2 * g * n * \text{Log}[a + b * x] * \text{Log}[c + d * x] * \text{Log}[(c + d * x)^{-n}]) / (d^2 i^2) \\
& - (b * B^2 * g * \text{Log}[a + b * x] * \text{Log}[(c + d * x)^{-n}]^2) / (d^2 i^2) + (b * B^2 * g * \text{Log}[-((d * (a + b * x)) / (b * c - a * d))] * \text{Log}[(c + d * x)^{-n}]^2) / (d^2 i^2) \\
& + (2 * b * B^2 * g * n * \text{Log}[-((d * (a + b * x)) / (b * c - a * d))] * \text{Log}[c + d * x] * (\text{Log}[(a + b * x)^n] - \text{Log}[e * ((a + b * x) / (c + d * x))^n] + \text{Log}[(c + d * x)^{-n}]]) / (d^2 i^2) \\
& - (2 * b * B^2 * g * n^2 * \text{PolyLog}[2, -((d * (a + b * x)) / (b * c - a * d))]) / (d^2 i^2) + (2 * b * B^2 * g * n * \text{Log}[(a + b * x)^n] * \text{PolyLog}[2, -((d * (a + b * x)) / (b * c - a * d))]) / (d^2 i^2) \\
& - (2 * A * b * B * g * n * \text{PolyLog}[2, (b * (c + d * x)) / (b * c - a * d)]) / (d^2 i^2) - (2 * b * B^2 * g * n^2 * \text{PolyLog}[2, (b * (c + d * x)) / (b * c - a * d)]) / (d^2 i^2) \\
& - (2 * b * B^2 * g * n * \text{Log}[(c + d * x)^{-n}] * \text{PolyLog}[2, (b * (c + d * x)) / (b * c - a * d)]) / (d^2 i^2) + (2 * b * B^2 * g * n * (\text{Log}[(a + b * x)^n] - \text{Log}[e * ((a + b * x) / (c + d * x))^n] + \text{Log}[(c + d * x)^{-n}]) * \text{PolyLog}[2, (b * (c + d * x)) / (b * c - a * d)]) / (d^2 i^2) \\
& - (2 * b * B^2 * g * n^2 * \text{PolyLog}[3, -((d * (a + b * x)) / (b * c - a * d))]) / (d^2 i^2) - (2 * b * B^2 * g * n^2 * \text{PolyLog}[3, (b * (c + d * x)) / (b * c - a * d)]) / (d^2 i^2)
\end{aligned}$$

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

```

### Rule 2525

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

```

### Rule 12

```

Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]

```

### Rule 2524

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S

```



```

ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

```

### Rule 2418

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]

```

### Rule 2390

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]

```

### Rule 2301

```

Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]

```

### Rule 2394

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]

```

### Rule 2393

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]

```

### Rule 2391

```

Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]

```

### Rule 44

```
Int[((a_) + (b_)*(x_))^(m_)*((c_) + (d_)*(x_))^(n_), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

### Rule 6688

```
Int[u_, x_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

### Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

### Rule 2500

```
Int[(Log[(e_)*((f_)*((a_) + (b_)*(x_))^(p_)*((c_) + (d_)*(x_))^(q_))
)^(r_)]*((s_) + Log[(i_)*((g_) + (h_)*(x_))^(n_)]*(t_))/((j_) + (k
_)*(x_)), x_Symbol] := Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

### Rule 2433

```
Int[((a_) + Log[(c_)*((d_) + (e_)*(x_))^(n_)]*(b_))^(p_)*((f_) + Log
[(h_)*((i_) + (j_)*(x_))^(m_)]*(g_))*((k_) + (l_)*(x_))^(r_), x_Sym
bol] := Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
e*i - d*j)/e + (j*x)/e]^m), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

### Rule 2375

```
Int[(Log[(d_)*((e_) + (f_)*(x_))^(m_))^(r_)]*((a_) + Log[(c_)*(x_))^(n_
)]*(b_))^(p_))/(x_), x_Symbol] := Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

### Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_.) + (e_.)*(x_)), x_Symbol]
:> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
  Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b,
  c, d, e, n}, x] && IGtQ[p, 0]
```

#### Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.))/(x_), x_Symbol]
:> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0] && EqQ[d*e, 1]
```

#### Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_)^(p_.))]/((d_.) + (e_.)*(x_)), x_Symbol]
:> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d, e, n, p}, x] && EqQ[b*d, a*e]
```

#### Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_.)]*(b_.))*((f_.) + Log[(h_.)*((i_.) + (j_.)*(x_)^(m_.)]*(g_.))*((k_) + (l_.)*(x_)^(r_.)), x_Symbol]
:> Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n]*(f + g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m)], x], x, k + l*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

#### Rule 2434

```
Int[((((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_.)]*(b_.))*((f_.) + Log[(h_.)*((i_.) + (j_.)*(x_)^(m_.)]*(g_.)))/(x_)), x_Symbol]
:> Simp[Log[x]*(a + b*Log[c*(d + e*x)^n]*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Log[x]*(a + b*Log[c*(d + e*x)^n))]/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x]*(f + g*Log[h*(i + j*x)^m))]/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

#### Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_)^(p_.))*((c_.) + (d_.)*(x_)^(q_.))^(r_.)]*(s_.) + Log[(i_.)*((g_.) + (h_.)*(x_)^(n_.)]*(t_.))^(m_.))/(j_.) + (k_.)*(x_)), x_Symbol]
:> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r)/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dist[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
```

$x] \&\& \text{NeQ}[b*c - a*d, 0] \&\& \text{EqQ}[h*j - g*k, 0] \&\& \text{IGtQ}[m, 0]$

### Rule 2396

$\text{Int}[(a_.) + \text{Log}[(c_.)*(d_.) + (e_.)*(x_.)]^{(n_.)}*(b_.)]^{(p_.)}/((f_.) + (g_.)*(x_.)), x\_Symbol] \rightarrow \text{Simp}[(\text{Log}[(e*(f + g*x))/(e*f - d*g)]*(a + b*\text{Log}[c*(d + e*x)^n])^p)/g, x] - \text{Dist}[(b*e*n*p)/g, \text{Int}[(\text{Log}[(e*(f + g*x))/(e*f - d*g)]*(a + b*\text{Log}[c*(d + e*x)^n])^{(p - 1)})/(d + e*x), x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, n, p\}, x] \&\& \text{NeQ}[e*f - d*g, 0] \&\& \text{IGtQ}[p, 1]$

### Rule 2302

$\text{Int}[(a_.) + \text{Log}[(c_.)*(x_.)]^{(n_.)}*(b_.)]^{(p_.)}/(x_.), x\_Symbol] \rightarrow \text{Dist}[1/(b*n), \text{Subst}[\text{Int}[x^p, x], x, a + b*\text{Log}[c*x^n]], x] /; \text{FreeQ}\{a, b, c, n, p\}, x]$

### Rule 30

$\text{Int}[(x_.)]^{(m_.)}, x\_Symbol] \rightarrow \text{Simp}[x^{(m + 1)}/(m + 1), x] /; \text{FreeQ}[m, x] \&\& \text{NeQ}[m, -1]$

### Rubi steps

$$\begin{aligned}
\int \frac{(ag + bgx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(196c + 196dx)^2} dx &= \int \left( \frac{(-bc + ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{38416d(c + dx)^2} + \frac{bg \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{38416d(c + dx)} \right) dx \\
&= \frac{(bg) \int \frac{\left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{c+dx} dx}{38416d} - \frac{((bc - ad)g) \int \frac{\left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(c+dx)^2} dx}{38416d} \\
&= \frac{(bc - ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{38416d^2(c + dx)} + \frac{bg \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 \log(c + dx)}{38416d^2} \\
&= \frac{(bc - ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{38416d^2(c + dx)} + \frac{bg \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 \log(c + dx)}{38416d^2} \\
&= \frac{(bc - ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{38416d^2(c + dx)} + \frac{bg \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 \log(c + dx)}{38416d^2} \\
&= \frac{(bc - ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{38416d^2(c + dx)} + \frac{bg \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 \log(c + dx)}{38416d^2} \\
&= \frac{(bc - ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{38416d^2(c + dx)} + \frac{bg \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 \log(c + dx)}{38416d^2} \\
&= -\frac{B(bc - ad)gn \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{19208d^2(c + dx)} - \frac{bBgn \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{19208d^2} \\
&= -\frac{B(bc - ad)gn \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{19208d^2(c + dx)} - \frac{bBgn \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{19208d^2} \\
&= -\frac{B(bc - ad)gn \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{19208d^2(c + dx)} - \frac{bBgn \log(a + bx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{19208d^2} \\
&= \frac{B^2(bc - ad)gn^2}{19208d^2(c + dx)} + \frac{bB^2gn^2 \log(a + bx)}{19208d^2} - \frac{B(bc - ad)gn \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{19208d^2(c + dx)} \\
&= \frac{B^2(bc - ad)gn^2}{19208d^2(c + dx)} + \frac{bB^2gn^2 \log(a + bx)}{19208d^2} + \frac{bB^2gn^2 \log^2(a + bx)}{38416d^2} - \frac{B(bc - ad)gn \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{19208d^2(c + dx)} \\
&= \frac{B^2(bc - ad)gn^2}{19208d^2(c + dx)} + \frac{bB^2gn^2 \log(a + bx)}{19208d^2} + \frac{bB^2gn^2 \log^2(a + bx)}{38416d^2} - \frac{B(bc - ad)gn \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{19208d^2(c + dx)}
\end{aligned}$$

**Mathematica [B]** time = 2.24838, size = 1261, normalized size = 4.47

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i + d
*i*x)^2,x]
```

```
[Out] (g*(((b*c - a*d)*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/
(c + d*x)])^2)/(c + d*x) + b*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Lo
g[(a + b*x)/(c + d*x)])^2*Log[c + d*x] + (2*a*B*d*n*(-A - B*Log[e*((a + b*x
)/(c + d*x))^n] + B*n*Log[(a + b*x)/(c + d*x)])*(b*c - a*d + b*(c + d*x)*Lo
g[a/b + x] + (-b*c) + a*d)*Log[(a + b*x)/(c + d*x)] - b*c*Log[(b*(c + d*x)
)/(b*c - a*d)] - b*d*x*Log[(b*(c + d*x))/(b*c - a*d)])))/((-b*c) + a*d)*(c
+ d*x)) + b*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(
c + d*x)])*(-Log[c/d + x]^2 + 2*Log[c/d + x]*Log[c + d*x] + 2*(-(c/(c + d*x
)) + (b*c*Log[a + b*x])/(-b*c) + a*d) + (b*c*Log[c + d*x])/(b*c - a*d) - L
og[a/b + x]*Log[c + d*x] + Log[(a + b*x)/(c + d*x)]*(c/(c + d*x) + Log[c +
d*x]) + Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a*d)]) + 2*PolyLog[2, (d*(a +
b*x))/(-b*c) + a*d)) - (a*B^2*d*n^2*(2*b*c - 2*a*d + 2*b*(c + d*x)*Log[a
+ b*x] - 2*(b*c - a*d)*Log[(a + b*x)/(c + d*x)] - 2*b*(c + d*x)*Log[a + b
x]*Log[(a + b*x)/(c + d*x)] + (b*c - a*d)*Log[(a + b*x)/(c + d*x)]^2 - 2*b*
(c + d*x)*Log[c + d*x] - 2*b*(c + d*x)*Log[(a + b*x)/(c + d*x)]*Log[(b*c -
a*d)/(b*c + b*d*x)] + b*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c
+ d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-b*c) + a*d]) + b*(c
+ d*x)*(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-b*c) + a*d]
] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d
)])))/((b*c - a*d)*(c + d*x)) + b*B^2*n^2*((c*Log[(a + b*x)/(c + d*x)]^2)/(
c + d*x) - Log[(a + b*x)/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)] - 2*Lo
g[(a + b*x)/(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] + (c*(2*b*c
- 2*a*d + 2*b*(c + d*x)*Log[a + b*x] - 2*(b*c - a*d)*Log[(a + b*x)/(c + d*x
)] - 2*b*(c + d*x)*Log[a + b*x]*Log[(a + b*x)/(c + d*x)] - 2*b*(c + d*x)*Lo
g[c + d*x] - 2*b*(c + d*x)*Log[(a + b*x)/(c + d*x)]*Log[(b*c - a*d)/(b*c +
b*d*x)] + b*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*
c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-b*c) + a*d]) + b*(c + d*x)*(Log
[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-b*c) + a*d]) + Log[(b*c
- a*d)/(b*c + b*d*x)]) - 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/((b*c
- a*d)*(c + d*x)) + 2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))]))/(d^2*i^2)
```

---

**Maple [F]** time = 0.551, size = 0, normalized size = 0.

$$\int \frac{bgx + ag}{(dix + ci)^2} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i)^2,x)

[Out] int((b\*g\*x+a\*g)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i)^2,x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$2 ABagn \left( \frac{1}{d^2 i^2 x + c d i^2} + \frac{b \log(bx + a)}{(bcd - ad^2) i^2} - \frac{b \log(dx + c)}{(bcd - ad^2) i^2} \right) + A^2 bg \left( \frac{c}{d^3 i^2 x + c d^2 i^2} + \frac{\log(dx + c)}{d^2 i^2} \right) - \frac{2 ABag \log \left( e \left( \frac{bx}{dx+c} + \right. \right.$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i)^2,x, algorithm="maxima")

[Out] 2\*A\*B\*a\*g\*n\*(1/(d^2\*i^2\*x + c\*d\*i^2) + b\*log(b\*x + a)/((b\*c\*d - a\*d^2)\*i^2) - b\*log(d\*x + c)/((b\*c\*d - a\*d^2)\*i^2)) + A^2\*b\*g\*(c/(d^3\*i^2\*x + c\*d^2\*i^2) + log(d\*x + c)/(d^2\*i^2)) - 2\*A\*B\*a\*g\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n)/(d^2\*i^2\*x + c\*d\*i^2) - A^2\*a\*g/(d^2\*i^2\*x + c\*d\*i^2) + ((b\*c\*g - a\*d\*g)\*B^2 + (B^2\*b\*d\*g\*x + B^2\*b\*c\*g)\*log(d\*x + c))\*log((d\*x + c)^n)^2/(d^3\*i^2\*x + c\*d^2\*i^2) - integrate(-(B^2\*a\*d\*g\*log(e)^2 + (B^2\*b\*d\*g\*x + B^2\*a\*d\*g)\*log((b\*x + a)^n)^2 + (B^2\*b\*d\*g\*log(e)^2 + 2\*A\*B\*b\*d\*g\*log(e))\*x + 2\*(B^2\*a\*d\*g\*log(e) + (B^2\*b\*d\*g\*log(e) + A\*B\*b\*d\*g)\*x)\*log((b\*x + a)^n) - 2\*((b\*c\*g\*n - (g\*n - g\*log(e))\*a\*d)\*B^2 + (B^2\*b\*d\*g\*log(e) + A\*B\*b\*d\*g)\*x + (B^2\*b\*d\*g\*n\*x + B^2\*b\*c\*g\*n)\*log(d\*x + c) + (B^2\*b\*d\*g\*x + B^2\*a\*d\*g)\*log((b\*x + a)^n))\*log((d\*x + c)^n))/(d^3\*i^2\*x^2 + 2\*c\*d^2\*i^2\*x + c^2\*d\*i^2), x)

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{A^2 bgx + A^2 ag + (B^2 bgx + B^2 ag) \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right)^2 + 2 (ABbgx + ABag) \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right)}{d^2 i^2 x^2 + 2 c d i^2 x + c^2 i^2}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x, algorithm="fricas")
```

```
[Out] integral((A^2*b*g*x + A^2*a*g + (B^2*b*g*x + B^2*a*g)*log(e*((b*x + a)/(d*x + c))^n))^2 + 2*(A*B*b*g*x + A*B*a*g)*log(e*((b*x + a)/(d*x + c))^n))/(d^2*i^2*x^2 + 2*c*d*i^2*x + c^2*i^2), x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag) \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2}{(dix + ci)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(d*i*x + c*i)^2, x)
```



$$3.197 \quad \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ci+dx)^2} dx$$

**Optimal.** Leaf size=163

$$\frac{(a+bx)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)^2}{i^2(c+dx)(bc-ad)} - \frac{2ABn(a+bx)}{i^2(c+dx)(bc-ad)} - \frac{2B^2n(a+bx) \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{i^2(c+dx)(bc-ad)} + \frac{2B^2n^2(a+bx)}{i^2(c+dx)(bc-ad)}$$

[Out]  $(-2*A*B*n*(a+b*x))/((b*c-a*d)*i^{2*(c+d*x)}) + (2*B^2*n^2*(a+b*x))/((b*c-a*d)*i^{2*(c+d*x)}) - (2*B^2*n*(a+b*x)*\text{Log}[e*((a+b*x)/(c+d*x))^n])/((b*c-a*d)*i^{2*(c+d*x)}) + ((a+b*x)*(A+B*\text{Log}[e*((a+b*x)/(c+d*x))^n])^2)/((b*c-a*d)*i^{2*(c+d*x)})$

**Rubi [C]** time = 0.755538, antiderivative size = 514, normalized size of antiderivative = 3.15, number of steps used = 24, number of rules used = 11, integrand size = 35,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.314$ , Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 44}

$$\frac{2bB^2n^2 \text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{di^2(bc-ad)} + \frac{2bB^2n^2 \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{di^2(bc-ad)} + \frac{2bBn \log(a+bx) \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{di^2(bc-ad)} + \frac{2Bn \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)^2}{di^2(bc-ad)}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2/(c*i + d*i*x)^2, x]$

[Out]  $(-2*B^2*n^2)/(d*i^{2*(c+d*x)}) - (2*b*B^2*n^2*\text{Log}[a+b*x])/((d*(b*c-a*d)*i^2) - (b*B^2*n^2*\text{Log}[a+b*x]^2)/((d*(b*c-a*d)*i^2) + (2*B*n*(A+B*\text{Log}[e*((a+b*x)/(c+d*x))^n]))/(d*i^{2*(c+d*x)}) + (2*b*B*n*\text{Log}[a+b*x]*(A+B*\text{Log}[e*((a+b*x)/(c+d*x))^n]))/(d*(b*c-a*d)*i^2) - (A+B*\text{Log}[e*((a+b*x)/(c+d*x))^n])^2/(d*i^{2*(c+d*x)}) + (2*b*B^2*n^2*\text{Log}[c+d*x])/((d*(b*c-a*d)*i^2) + (2*b*B^2*n^2*\text{Log}[-(d*(a+b*x))/(b*c-a*d)])*\text{Log}[c+d*x])/((d*(b*c-a*d)*i^2) - (2*b*B*n*(A+B*\text{Log}[e*((a+b*x)/(c+d*x))^n])*\text{Log}[c+d*x])/((d*(b*c-a*d)*i^2) - (b*B^2*n^2*\text{Log}[c+d*x]^2)/((d*(b*c-a*d)*i^2) + (2*b*B^2*n^2*\text{Log}[a+b*x]*\text{Log}[(b*(c+d*x))/(b*c-a*d)])/(d*(b*c-a*d)*i^2) + (2*b*B^2*n^2*\text{PolyLog}[2, -(d*(a+b*x))/(b*c-a*d)])/(d*(b*c-a*d)*i^2) + (2*b*B^2*n^2*\text{PolyLog}[2, (b*(c+d*x))/(b*c-a*d)])/(d*(b*c-a*d)*i^2)$

**Rule 2525**

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_) /; FreeQ[b, x]]
```

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(Rfx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, Rfx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[Rfx, x] && IntegerQ[p]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))])*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]/(x_), x_Symbol] :> -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(197c + 197dx)^2} dx &= -\frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38809d(c + dx)} + \frac{(2Bn) \int \frac{(bc-ad)\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{197(a+bx)(c+dx)^2} dx}{197d} \\
&= -\frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38809d(c + dx)} + \frac{(2B(bc - ad)n) \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)(c+dx)^2} dx}{38809d} \\
&= -\frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38809d(c + dx)} + \frac{(2B(bc - ad)n) \int \left(\frac{b^2\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)^2(a+bx)} - \frac{d\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)(c+dx)^2}\right) dx}{38809d} \\
&= -\frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{38809d(c + dx)} - \frac{(2Bn) \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(c+dx)^2} dx}{38809} - \frac{(2bBn) \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx} dx}{38809(bc - ad)} \\
&= \frac{2Bn\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{38809d(c + dx)} + \frac{2bBn \log(a + bx)\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{38809d(bc - ad)} - \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{38809} \\
&= \frac{2Bn\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{38809d(c + dx)} + \frac{2bBn \log(a + bx)\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{38809d(bc - ad)} - \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{38809} \\
&= \frac{2Bn\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{38809d(c + dx)} + \frac{2bBn \log(a + bx)\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{38809d(bc - ad)} - \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{38809} \\
&= -\frac{2B^2n^2}{38809d(c + dx)} - \frac{2bB^2n^2 \log(a + bx)}{38809d(bc - ad)} + \frac{2Bn\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{38809d(c + dx)} + \frac{2bBn \log(a + bx)\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{38809d(bc - ad)} \\
&= -\frac{2B^2n^2}{38809d(c + dx)} - \frac{2bB^2n^2 \log(a + bx)}{38809d(bc - ad)} - \frac{bB^2n^2 \log^2(a + bx)}{38809d(bc - ad)} + \frac{2Bn\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{38809d(c + dx)} \\
&= -\frac{2B^2n^2}{38809d(c + dx)} - \frac{2bB^2n^2 \log(a + bx)}{38809d(bc - ad)} - \frac{bB^2n^2 \log^2(a + bx)}{38809d(bc - ad)} + \frac{2Bn\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{38809d(c + dx)}
\end{aligned}$$

**Mathematica [C]** time = 0.466976, size = 331, normalized size = 2.03

$$Bn\left(-bBn(c+dx)\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+bBn(c+dx)\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)+2(bc-$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2/(c\*i + d\*i\*x)^2,x]

[Out]  $(-(A + B \cdot \text{Log}[e \cdot ((a + b \cdot x)/(c + d \cdot x))^n])^2 + (B \cdot n \cdot (2 \cdot (b \cdot c - a \cdot d) \cdot (A + B \cdot \text{Log}[e \cdot ((a + b \cdot x)/(c + d \cdot x))^n]) + 2 \cdot b \cdot (c + d \cdot x) \cdot \text{Log}[a + b \cdot x] \cdot (A + B \cdot \text{Log}[e \cdot ((a + b \cdot x)/(c + d \cdot x))^n]) - 2 \cdot b \cdot (c + d \cdot x) \cdot (A + B \cdot \text{Log}[e \cdot ((a + b \cdot x)/(c + d \cdot x))^n]) \cdot \text{Log}[c + d \cdot x] - 2 \cdot B \cdot n \cdot (b \cdot c - a \cdot d + b \cdot (c + d \cdot x) \cdot \text{Log}[a + b \cdot x] - b \cdot (c + d \cdot x) \cdot \text{Log}[c + d \cdot x]) - b \cdot B \cdot n \cdot (c + d \cdot x) \cdot (\text{Log}[a + b \cdot x] \cdot (\text{Log}[a + b \cdot x] - 2 \cdot \text{Log}[(b \cdot (c + d \cdot x))/(b \cdot c - a \cdot d)]) - 2 \cdot \text{PolyLog}[2, (d \cdot (a + b \cdot x))/(-b \cdot c + a \cdot d)]) + b \cdot B \cdot n \cdot (c + d \cdot x) \cdot ((2 \cdot \text{Log}[(d \cdot (a + b \cdot x))/(-b \cdot c + a \cdot d)] - \text{Log}[c + d \cdot x]) \cdot \text{Log}[c + d \cdot x] + 2 \cdot \text{PolyLog}[2, (b \cdot (c + d \cdot x))/(b \cdot c - a \cdot d)])))/(b \cdot c - a \cdot d))/(d \cdot i^2 \cdot (c + d \cdot x))$

**Maple [F]** time = 0.532, size = 0, normalized size = 0.

$$\int \frac{1}{(dix + ci)^2} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i)^2,x)

[Out] int((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i)^2,x)

**Maxima [B]** time = 1.30244, size = 578, normalized size = 3.55

$$2ABn \left( \frac{1}{d^2i^2x + cdi^2} + \frac{b \log(bx + a)}{(bcd - ad^2)i^2} - \frac{b \log(dx + c)}{(bcd - ad^2)i^2} \right) + \left( 2n \left( \frac{1}{d^2i^2x + cdi^2} + \frac{b \log(bx + a)}{(bcd - ad^2)i^2} - \frac{b \log(dx + c)}{(bcd - ad^2)i^2} \right) \log \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i)^2,x, algorithm="maxima")

[Out]  $2 \cdot A \cdot B \cdot n \cdot (1/(d^2 \cdot i^2 \cdot x + c \cdot d \cdot i^2) + b \cdot \log(b \cdot x + a)/((b \cdot c \cdot d - a \cdot d^2) \cdot i^2) - b \cdot \log(d \cdot x + c)/((b \cdot c \cdot d - a \cdot d^2) \cdot i^2)) + (2 \cdot n \cdot (1/(d^2 \cdot i^2 \cdot x + c \cdot d \cdot i^2) + b \cdot \log(b \cdot x + a)/((b \cdot c \cdot d - a \cdot d^2) \cdot i^2) - b \cdot \log(d \cdot x + c)/((b \cdot c \cdot d - a \cdot d^2) \cdot i^2))) \cdot \log \left( e \left( \frac{bx + a}{dx + c} \right)^n \right)$

$$\frac{g(b*x + a)/((b*c*d - a*d^2)*i^2) - b*\log(d*x + c)/((b*c*d - a*d^2)*i^2))*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n) - ((b*d*x + b*c)*\log(b*x + a)^2 + (b*d*x + b*c)*\log(d*x + c)^2 + 2*b*c - 2*a*d + 2*(b*d*x + b*c)*\log(b*x + a) - 2*(b*d*x + b*c + (b*d*x + b*c)*\log(b*x + a))*\log(d*x + c))^n^2/(b*c^2*d*i^2 - a*c*d^2*i^2 + (b*c*d^2*i^2 - a*d^3*i^2)*x))*B^2 - B^2*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n)^2/(d^2*i^2*x + c*d*i^2) - 2*A*B*\log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(d^2*i^2*x + c*d*i^2) - A^2/(d^2*i^2*x + c*d*i^2)}$$

**Fricas [A]** time = 0.529081, size = 555, normalized size = 3.4

$$\frac{A^2bc - A^2ad + 2(B^2bc - B^2ad)n^2 + (B^2bc - B^2ad)\log(e)^2 - (B^2bdn^2x + B^2adn^2)\log\left(\frac{bx+a}{dx+c}\right)^2 - 2(ABbc - ABad)n + 2}{(bcd^2 - ad^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^2,x, algorithm="fricas")
```

```
[Out] -(A^2*b*c - A^2*a*d + 2*(B^2*b*c - B^2*a*d)*n^2 + (B^2*b*c - B^2*a*d)*log(e)^2 - (B^2*b*d*n^2*x + B^2*a*d*n^2)*log((b*x + a)/(d*x + c))^2 - 2*(A*B*b*c - A*B*a*d)*n + 2*(A*B*b*c - A*B*a*d - (B^2*b*c - B^2*a*d)*n - (B^2*b*d*n*x + B^2*a*d*n)*log((b*x + a)/(d*x + c)))*log(e) + 2*(B^2*a*d*n^2 - A*B*a*d*n + (B^2*b*d*n^2 - A*B*b*d*n)*x)*log((b*x + a)/(d*x + c)))/((b*c*d^2 - a*d^3)*i^2*x + (b*c^2*d - a*c*d^2)*i^2)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)**2,x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2}{(dix + ci)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i)^2,x, algorithm="giac")

[Out] integrate((B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)^2/(d\*i\*x + c\*i)^2, x)

$$3.198 \quad \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)(ci+dix)^2} dx$$

**Optimal.** Leaf size=231

$$\frac{b\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)^3}{3Bgi^2n(bc-ad)^2} - \frac{d(a+bx)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)^2}{gi^2(c+dx)(bc-ad)^2} + \frac{2ABdn(a+bx)}{gi^2(c+dx)(bc-ad)^2} + \frac{2B^2dn(a+bx) \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{gi^2(c+dx)(bc-ad)^2}$$

[Out]  $(2*A*B*d*n*(a + b*x))/((b*c - a*d)^2*g*i^2*(c + d*x)) - (2*B^2*d*n^2*(a + b*x))/((b*c - a*d)^2*g*i^2*(c + d*x)) + (2*B^2*d*n*(a + b*x)*\text{Log}[e*((a + b*x)/(c + d*x))^n])/((b*c - a*d)^2*g*i^2*(c + d*x)) - (d*(a + b*x)*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^2*g*i^2*(c + d*x)) + (b*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^3)/(3*B*(b*c - a*d)^2*g*i^2*n)$

**Rubi [C]** time = 6.11183, antiderivative size = 1803, normalized size of antiderivative = 7.81, number of steps used = 83, number of rules used = 31, integrand size = 45,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.689$ , Rules used = {2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 12, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2525, 44, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

[In]  $\text{Int}[(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)*(c*i + d*i*x)^2), x]$

[Out]  $(2*B^2*n^2)/((b*c - a*d)*g*i^2*(c + d*x)) + (2*b*B^2*n^2*\text{Log}[a + b*x])/((b*c - a*d)^2*g*i^2) - (A*b*B*n*\text{Log}[a + b*x]^2)/((b*c - a*d)^2*g*i^2) + (b*B^2*n^2*\text{Log}[a + b*x]^2)/((b*c - a*d)^2*g*i^2) - (b*B^2*\text{Log}[-((b*c - a*d)/(d*(a + b*x))])*\text{Log}[e*((a + b*x)/(c + d*x))^n]^2)/((b*c - a*d)^2*g*i^2) - (b*B^2*\text{Log}[a + b*x]*\text{Log}[e*((a + b*x)/(c + d*x))^n]^2)/((b*c - a*d)^2*g*i^2) - (2*B*n*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)*g*i^2*(c + d*x)) - (2*b*B*n*\text{Log}[a + b*x]*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^2*g*i^2) + (A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2/((b*c - a*d)*g*i^2*(c + d*x)) + (b*\text{Log}[a + b*x]*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^2*g*i^2) - (2*b*B^2*n^2*\text{Log}[c + d*x])/((b*c - a*d)^2*g*i^2) + (2*A*b*B*n*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/((b*c - a*d)^2*g*i^2) - (2*b*B^2*n^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/((b*c - a*d)^2*g*i^2)$



$$\begin{aligned}
& 2*g*i^2) + (b*B^2*Log[(a + b*x)^n]^2*Log[c + d*x])/((b*c - a*d)^2*g*i^2) + \\
& (2*b*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/((b*c - a*d)^2*g*i^2) - (b*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[c + d*x])/((b*c - a*d)^2*g*i^2) - (A*b*B*n*Log[c + d*x]^2)/((b*c - a*d)^2*g*i^2) + (b*B^2*n^2*Log[c + d*x]^2)/((b*c - a*d)^2*g*i^2) + (b*B^2*n^2*Log[a + b*x]*Log[c + d*x]^2)/((b*c - a*d)^2*g*i^2) - (b*B^2*n*Log[e*((a + b*x)/(c + d*x))^n]*Log[c + d*x]^2)/((b*c - a*d)^2*g*i^2) - (b*B^2*n^2*Log[c + d*x]^3)/(3*(b*c - a*d)^2*g*i^2) + (2*A*b*B*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g*i^2) - (2*b*B^2*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g*i^2) - (b*B^2*Log[(a + b*x)^n]^2*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g*i^2) + (2*b*B^2*n*Log[a + b*x]*Log[c + d*x]*Log[(c + d*x)^(-n)])/((b*c - a*d)^2*g*i^2) + (b*B^2*Log[a + b*x]*Log[(c + d*x)^(-n)]^2)/((b*c - a*d)^2*g*i^2) - (b*B^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^(-n)]^2)/((b*c - a*d)^2*g*i^2) - (2*b*B^2*n*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x]*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)]))/((b*c - a*d)^2*g*i^2) + (2*A*b*B*n*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^2*g*i^2) - (2*b*B^2*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^2*g*i^2) - (2*b*B^2*n*Log[(a + b*x)^n]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^2*g*i^2) + (2*A*b*B*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g*i^2) - (2*b*B^2*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g*i^2) + (2*b*B^2*n*Log[(c + d*x)^(-n)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g*i^2) - (2*b*B^2*n*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g*i^2) + (2*b*B^2*n*Log[e*((a + b*x)/(c + d*x))^n]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^2*g*i^2) + (2*b*B^2*n^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^2*g*i^2) + (2*b*B^2*n^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^2*g*i^2) + (2*b*B^2*n^2*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^2*g*i^2)
\end{aligned}$$

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFX^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFX, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

```

### Rule 2524

```

Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFX^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0]

```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol]
:= With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n]]^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)
*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)
^n]))/g, x] - Dist[(b*e^n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

### Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

### Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] := Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

### Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
x_Symbol] := Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

### Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] := Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

### Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] := With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
h*x)^t]^u)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s + 1))/(p*r*(s + 1)*(b*c
- a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q]^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
EqQ[p + q, 0] && NeQ[s, -1]
```

### Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] := -Simp[(Log[-(b*c - a*d)/(
```

$d*(a + b*x))) * \text{Log}[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s/h, x] + \text{Dist}[(p*r*s*(b*c - a*d))/h, \text{Int}[(\text{Log}[-((b*c - a*d)/(d*(a + b*x))]) * \text{Log}[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^{(s - 1)})/((a + b*x)*(c + d*x)), x], x] /;$  FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && EqQ[b\*g - a\*h, 0] && IGtQ[s, 0]

#### Rule 2506

$\text{Int}[\text{Log}[v\_]*\text{Log}[(e\_)*((f\_)*((a\_)+(b\_)*(x\_))^{(p\_)*((c\_)+(d\_)*(x\_))^{(q\_))^{(r\_)}])^{(s\_)}*(u\_), x\_Symbol] :> \text{With}[\{g = \text{Simplify}[(v - 1)*(c + d*x)/(a + b*x)], h = \text{Simplify}[u*(a + b*x)*(c + d*x)]\}, -\text{Simp}[(h*\text{PolyLog}[2, 1 - v]*\text{Log}[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s/(b*c - a*d), x] + \text{Dist}[h*p*r*s, \text{Int}[(\text{PolyLog}[2, 1 - v]*\text{Log}[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^{(s - 1)})/((a + b*x)*(c + d*x)), x], x] /;$  FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]

#### Rule 6610

$\text{Int}[(u\_)*\text{PolyLog}[n, v], x\_Symbol] :> \text{With}[\{w = \text{DerivativeDivides}[v, u*v, x]\}, \text{Simp}[w*\text{PolyLog}[n + 1, v], x] /;$  !FalseQ[w]] /; FreeQ[n, x]

#### Rule 2525

$\text{Int}[(a\_ + \text{Log}[(c\_)*(RfX\_)^{(p\_)}]*(b\_))^{(n\_)*((d\_)+(e\_)*(x\_))^{(m\_)}), x\_Symbol] :> \text{Simp}[(d + e*x)^{(m + 1)}*(a + b*\text{Log}[c*RfX^p])^n/(e*(m + 1)), x] - \text{Dist}[(b*n*p)/(e*(m + 1)), \text{Int}[\text{SimplifyIntegrand}[(d + e*x)^{(m + 1)}*(a + b*\text{Log}[c*RfX^p])^{(n - 1)}*D[RfX, x])/RfX, x], x] /;$  FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RfX, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

#### Rule 44

$\text{Int}[(a\_ + (b\_)*(x\_))^{(m\_)*((c\_)+(d\_)*(x\_))^{(n\_)}), x\_Symbol] :> \text{Int}[\text{ExpandIntegrand}[(a + b*x)^m*(c + d*x)^n, x], x] /;$  FreeQ[{a, b, c, d}, x] && NeQ[b\*c - a\*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])

#### Rule 2500

$\text{Int}[(\text{Log}[(e\_)*((f\_)*((a\_)+(b\_)*(x\_))^{(p\_)*((c\_)+(d\_)*(x\_))^{(q\_)}))^{(r\_)}])^{(s\_)} + \text{Log}[(i\_)*((g\_)+(h\_)*(x\_))^{(n\_)}]*(t\_)]/((j\_)+(k\_)*(x\_)), x\_Symbol] :> \text{Dist}[\text{Log}[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - \text{Log}[(a + b*x)^{(p*r)}] - \text{Log}[(c + d*x)^{(q*r)}], \text{Int}[(s + t*\text{Log}[i*(g + h*x)^n])/(j + k*x), x], x] + (\text{Int}[(\text{Log}[(a + b*x)^{(p*r)}]*(s + t*\text{Log}[i*(g + h*x)^n])/(j + k*x), x] + \text{Int}[(\text{Log}[(c + d*x)^{(q*r)}]*(s + t*\text{Log}[i*(g + h*x)^n])/(j + k*x),$

x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0]

### Rule 2433

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_.) + Log[(h\_.)\*((i\_.) + (j\_.)\*(x\_))^(m\_.)]\*(g\_.))\*((k\_.) + (l\_.)\*(x\_))^(r\_.), x\_Symbol] := Dist[1/e, Subst[Int[((k\*x)/d)^r\*(a + b\*Log[c\*x^n])^p\*(f + g\*Log[h\*(e\*i - d\*j)/e + (j\*x)/e]^m)], x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e\*k - d\*l, 0]

### Rule 2375

Int[(Log[(d\_.)\*((e\_) + (f\_.)\*(x\_)^(m\_.))]^(r\_.))\*((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/(x\_), x\_Symbol] := Simp[(Log[d\*(e + f\*x^m)^r]\*(a + b\*Log[c\*x^n])^(p + 1))/(b\*n\*(p + 1)), x] - Dist[(f\*m\*r)/(b\*n\*(p + 1)), Int[(x^(m - 1)\*(a + b\*Log[c\*x^n])^(p + 1))/(e + f\*x^m), x], x] /; FreeQ[{a, b, c, d, e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d\*e, 1]

### Rule 2374

Int[(Log[(d\_.)\*((e\_) + (f\_.)\*(x\_)^(m\_.))]\*((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.))/(x\_), x\_Symbol] := -Simp[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^p)/m, x] + Dist[(b\*n\*p)/m, Int[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0] && EqQ[d\*e, 1]

### Rule 6589

Int[PolyLog[n\_, (c\_.)\*((a\_.) + (b\_.)\*(x\_)^(p\_.))]/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] := Simp[PolyLog[n + 1, c\*(a + b\*x)^p]/(e\*p), x] /; FreeQ[{a, b, c, d, e, n, p}, x] && EqQ[b\*d, a\*e]

### Rule 2440

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))\*((f\_.) + Log[(h\_.)\*((i\_.) + (j\_.)\*(x\_))^(m\_.)]\*(g\_.))\*((k\_.) + (l\_.)\*(x\_))^(r\_.), x\_Symbol] := Dist[1/l, Subst[Int[x^r\*(a + b\*Log[c\*(-((e\*k - d\*l)/l) + (e\*x)/l)^n]\*(f + g\*Log[h\*(-((j\*k - i\*l)/l) + (j\*x)/l)^m)], x], x, k + l\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]

### Rule 2434

Int[(((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))\*((f\_.) + Log[(h\_.)\*((i\_.) + (j\_.)\*(x\_))^(m\_.)]\*(g\_.)))/(x\_), x\_Symbol] := Simp[Log[x]\*(a + b

\*Log[c\*(d + e\*x)^n]\*(f + g\*Log[h\*(i + j\*x)^m]), x] + (-Dist[e\*g\*m, Int[(Log[x]\*g\*(a + b\*Log[c\*(d + e\*x)^n]))/(d + e\*x), x], x] - Dist[b\*j\*n, Int[(Log[x]\*(f + g\*Log[h\*(i + j\*x)^m)))/(i + j\*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, m, n}, x] && EqQ[e\*i - d\*j, 0]

### Rule 2499

Int[(Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^r\_.)]\*((s\_.) + Log[(i\_.)\*((g\_.) + (h\_.)\*(x\_))^(n\_.)]\*(t\_.))^(m\_.))/((j\_.) + (k\_.)\*(x\_)), x\_Symbol] := Simp[((s + t\*Log[i\*(g + h\*x)^n])^(m + 1)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r)/(k\*n\*t\*(m + 1)), x] + (-Dist[(b\*p\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(a + b\*x), x], x] - Dist[(d\*q\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(c + d\*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0] && EqQ[h\*j - g\*k, 0] && IGtQ[m, 0]

### Rule 2396

Int[((a\_.) + Log[(c\_.)\*((d\_.) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])^p)/g, x] - Dist[(b\*e\*n\*p)/g, Int[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])^(p - 1))/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p}, x] && NeQ[e\*f - d\*g, 0] && IGtQ[p, 1]

### Rule 2302

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.))/(x\_), x\_Symbol] := Dist[1/(b\*n), Subst[Int[x^p, x], x, a + b\*Log[c\*x^n]], x] /; FreeQ[{a, b, c, n, p}, x]

### Rule 30

Int[(x\_)^(m\_.), x\_Symbol] := Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && NeQ[m, -1]

### Rubi steps

$$\begin{aligned}
\int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(198c + 198dx)^2(ag + bgx)} dx &= \int \left( \frac{b^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc - ad)^2g(a + bx)} - \frac{d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc - ad)g(c + dx)^2} - \frac{bd \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc - ad)^2g} \right) dx \\
&= \frac{b^2 \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx} dx}{39204(bc - ad)^2g} - \frac{(bd) \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx} dx}{39204(bc - ad)^2g} - \frac{d \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(c+dx)^2} dx}{39204(bc - ad)g} \\
&= \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc - ad)g(c + dx)} + \frac{b \log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc - ad)^2g} - \frac{b \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc - ad)^2g} \\
&= \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc - ad)g(c + dx)} + \frac{b \log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc - ad)^2g} - \frac{b \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc - ad)^2g} \\
&= \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc - ad)g(c + dx)} + \frac{b \log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc - ad)^2g} - \frac{b \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc - ad)^2g} \\
&= \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc - ad)g(c + dx)} + \frac{b \log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc - ad)^2g} - \frac{b \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc - ad)^2g} \\
&= \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc - ad)g(c + dx)} + \frac{b \log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc - ad)^2g} - \frac{b \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc - ad)^2g} \\
&= -\frac{Bn \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{19602(bc - ad)g(c + dx)} - \frac{bBn \log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{19602(bc - ad)^2g} + \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39204(bc - ad)^2g} \\
&= -\frac{bB^2 \log(a + bx) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{39204(bc - ad)^2g} - \frac{Bn \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{19602(bc - ad)g(c + dx)} - \frac{bBn \log(a + bx)}{19602(bc - ad)^2g} \\
&= -\frac{bB^2 \log\left(-\frac{bc-ad}{d(a+bx)}\right) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{39204(bc - ad)^2g} - \frac{bB^2 \log(a + bx) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{39204(bc - ad)^2g} - \frac{Bn \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{19602(bc - ad)g(c + dx)} \\
&= \frac{B^2n^2}{19602(bc - ad)g(c + dx)} + \frac{bB^2n^2 \log(a + bx)}{19602(bc - ad)^2g} - \frac{AbBn \log^2(a + bx)}{39204(bc - ad)^2g} - \frac{bB^2 \log\left(-\frac{bc-ad}{d(a+bx)}\right)}{39204(bc - ad)^2g} \\
&= \frac{B^2n^2}{19602(bc - ad)g(c + dx)} + \frac{bB^2n^2 \log(a + bx)}{19602(bc - ad)^2g} - \frac{AbBn \log^2(a + bx)}{39204(bc - ad)^2g} + \frac{bB^2n^2 \log^2\left(-\frac{bc-ad}{d(a+bx)}\right)}{39204(bc - ad)^2g}
\end{aligned}$$

**Mathematica [B]** time = 0.950208, size = 789, normalized size = 3.42

$$\frac{b \log(a + bx) \left( 2AB \left( \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) - n \log \left( \frac{a+bx}{c+dx} \right) \right) + B^2 \left( \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) - n \log \left( \frac{a+bx}{c+dx} \right) \right)^2 - 2B^2 n \left( \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) - n \log \left( \frac{a+bx}{c+dx} \right) \right)}{g^2(bc - ad)^2}$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2/((a\*g + b\*g\*x)\*(c\*i + d\*i\*x)^2), x]

[Out] (b\*B^2\*n^2\*Log[(a + b\*x)/(c + d\*x)]^3)/(3\*(b\*c - a\*d)^2\*g\*i^2) - (2\*B\*n\*Log[(a + b\*x)/(c + d\*x)]\*(-A + B\*n - B\*(Log[e\*((a + b\*x)/(c + d\*x))^n] - n\*Log[(a + b\*x)/(c + d\*x)])))/((b\*c - a\*d)\*g\*i^2\*(c + d\*x)) + (Log[(a + b\*x)/(c + d\*x)]^2\*(A\*b\*B\*c\*n - a\*B^2\*d\*n^2 + A\*b\*B\*d\*n\*x - b\*B^2\*d\*n^2\*x + b\*B^2\*c\*n\*(Log[e\*((a + b\*x)/(c + d\*x))^n] - n\*Log[(a + b\*x)/(c + d\*x)]) + b\*B^2\*d\*n\*x\*(Log[e\*((a + b\*x)/(c + d\*x))^n] - n\*Log[(a + b\*x)/(c + d\*x)])))/((b\*c - a\*d)^2\*g\*i^2\*(c + d\*x)) + (A^2 - 2\*A\*B\*n + 2\*B^2\*n^2 + 2\*A\*B\*(Log[e\*((a + b\*x)/(c + d\*x))^n] - n\*Log[(a + b\*x)/(c + d\*x)]) - 2\*B^2\*n\*(Log[e\*((a + b\*x)/(c + d\*x))^n] - n\*Log[(a + b\*x)/(c + d\*x)]) + B^2\*(Log[e\*((a + b\*x)/(c + d\*x))^n] - n\*Log[(a + b\*x)/(c + d\*x)])^2)/((b\*c - a\*d)\*g\*i^2\*(c + d\*x)) + (b\*Log[a + b\*x]\*(A^2 - 2\*A\*B\*n + 2\*B^2\*n^2 + 2\*A\*B\*(Log[e\*((a + b\*x)/(c + d\*x))^n] - n\*Log[(a + b\*x)/(c + d\*x)]) - 2\*B^2\*n\*(Log[e\*((a + b\*x)/(c + d\*x))^n] - n\*Log[(a + b\*x)/(c + d\*x)]) + B^2\*(Log[e\*((a + b\*x)/(c + d\*x))^n] - n\*Log[(a + b\*x)/(c + d\*x)])^2))/((b\*c - a\*d)^2\*g\*i^2) - (b\*(A^2 - 2\*A\*B\*n + 2\*B^2\*n^2 + 2\*A\*B\*(Log[e\*((a + b\*x)/(c + d\*x))^n] - n\*Log[(a + b\*x)/(c + d\*x)]) - 2\*B^2\*n\*(Log[e\*((a + b\*x)/(c + d\*x))^n] - n\*Log[(a + b\*x)/(c + d\*x)]) + B^2\*(Log[e\*((a + b\*x)/(c + d\*x))^n] - n\*Log[(a + b\*x)/(c + d\*x)])^2))/((b\*c - a\*d)^2\*g\*i^2) + B^2\*(Log[e\*((a + b\*x)/(c + d\*x))^n] - n\*Log[(a + b\*x)/(c + d\*x)])^2\*Log[(c + d\*x)]/((b\*c - a\*d)^2\*g\*i^2)

**Maple [F]** time = 0.689, size = 0, normalized size = 0.

$$\int \frac{1}{(bgx + ag)(dix + ci)^2} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)/(d\*i\*x+c\*i)^2, x)

[Out] int((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)/(d\*i\*x+c\*i)^2, x)



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**Maxima [B]** time = 1.52465, size = 1369, normalized size = 5.93

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)/(d\*i\*x+c\*i)^2,x, algorithm="maxima")

[Out] 
$$B^2 \cdot \left( \frac{1}{(b \cdot c \cdot d - a \cdot d^2) \cdot g \cdot i^{2 \cdot x} + (b \cdot c^2 - a \cdot c \cdot d) \cdot g \cdot i^2} + b \cdot \log(b \cdot x + a) / \left( (b^2 \cdot c^2 - 2 \cdot a \cdot b \cdot c \cdot d + a^2 \cdot d^2) \cdot g \cdot i^2 \right) - b \cdot \log(d \cdot x + c) / \left( (b^2 \cdot c^2 - 2 \cdot a \cdot b \cdot c \cdot d + a^2 \cdot d^2) \cdot g \cdot i^2 \right) \right) \cdot \log(e \cdot (b \cdot x / (d \cdot x + c) + a / (d \cdot x + c)) \cdot i)^2 + 2 \cdot A \cdot B \cdot \left( \frac{1}{(b \cdot c \cdot d - a \cdot d^2) \cdot g \cdot i^{2 \cdot x} + (b \cdot c^2 - a \cdot c \cdot d) \cdot g \cdot i^2} + b \cdot \log(b \cdot x + a) / \left( (b^2 \cdot c^2 - 2 \cdot a \cdot b \cdot c \cdot d + a^2 \cdot d^2) \cdot g \cdot i^2 \right) - b \cdot \log(d \cdot x + c) / \left( (b^2 \cdot c^2 - 2 \cdot a \cdot b \cdot c \cdot d + a^2 \cdot d^2) \cdot g \cdot i^2 \right) \right) \cdot \log(e \cdot (b \cdot x / (d \cdot x + c) + a / (d \cdot x + c)) \cdot i)^n + \frac{1}{3} \cdot \left( (b \cdot d \cdot x + b \cdot c) \cdot \log(b \cdot x + a)^3 - (b \cdot d \cdot x + b \cdot c) \cdot \log(d \cdot x + c)^3 + 3 \cdot (b \cdot d \cdot x + b \cdot c) \cdot \log(b \cdot x + a)^2 + 3 \cdot (b \cdot d \cdot x + b \cdot c + (b \cdot d \cdot x + b \cdot c) \cdot \log(b \cdot x + a)) \cdot \log(d \cdot x + c)^2 + 6 \cdot b \cdot c - 6 \cdot a \cdot d + 6 \cdot (b \cdot d \cdot x + b \cdot c) \cdot \log(b \cdot x + a) - 3 \cdot (2 \cdot b \cdot d \cdot x + (b \cdot d \cdot x + b \cdot c) \cdot \log(b \cdot x + a))^2 + 2 \cdot b \cdot c + 2 \cdot (b \cdot d \cdot x + b \cdot c) \cdot \log(b \cdot x + a) \right) \cdot \log(d \cdot x + c) \cdot n^2 / (b^2 \cdot c^3 \cdot g \cdot i^2 - 2 \cdot a \cdot b \cdot c^2 \cdot d \cdot g \cdot i^2 + a^2 \cdot c \cdot d^2 \cdot g \cdot i^2 + (b^2 \cdot c^2 \cdot d \cdot g \cdot i^2 - 2 \cdot a \cdot b \cdot c \cdot d^2 \cdot g \cdot i^2 + a^2 \cdot d^3 \cdot g \cdot i^2) \cdot x) - 3 \cdot \left( (b \cdot d \cdot x + b \cdot c) \cdot \log(b \cdot x + a)^2 + (b \cdot d \cdot x + b \cdot c) \cdot \log(d \cdot x + c)^2 + 2 \cdot b \cdot c - 2 \cdot a \cdot d + 2 \cdot (b \cdot d \cdot x + b \cdot c) \cdot \log(b \cdot x + a) - 2 \cdot (b \cdot d \cdot x + b \cdot c + (b \cdot d \cdot x + b \cdot c) \cdot \log(b \cdot x + a)) \cdot \log(d \cdot x + c) \right) \cdot n \cdot \log(e \cdot (b \cdot x / (d \cdot x + c) + a / (d \cdot x + c)) \cdot i)^n / (b^2 \cdot c^3 \cdot g \cdot i^2 - 2 \cdot a \cdot b \cdot c^2 \cdot d \cdot g \cdot i^2 + a^2 \cdot c \cdot d^2 \cdot g \cdot i^2 + (b^2 \cdot c^2 \cdot d \cdot g \cdot i^2 - 2 \cdot a \cdot b \cdot c \cdot d^2 \cdot g \cdot i^2 + a^2 \cdot d^3 \cdot g \cdot i^2) \cdot x) \right) \cdot B^2 - \left( (b \cdot d \cdot x + b \cdot c) \cdot \log(b \cdot x + a)^2 + (b \cdot d \cdot x + b \cdot c) \cdot \log(d \cdot x + c)^2 + 2 \cdot b \cdot c - 2 \cdot a \cdot d + 2 \cdot (b \cdot d \cdot x + b \cdot c) \cdot \log(b \cdot x + a) - 2 \cdot (b \cdot d \cdot x + b \cdot c + (b \cdot d \cdot x + b \cdot c) \cdot \log(b \cdot x + a)) \cdot \log(d \cdot x + c) \right) \cdot A \cdot B \cdot n / (b^2 \cdot c^3 \cdot g \cdot i^2 - 2 \cdot a \cdot b \cdot c^2 \cdot d \cdot g \cdot i^2 + a^2 \cdot c \cdot d^2 \cdot g \cdot i^2 + (b^2 \cdot c^2 \cdot d \cdot g \cdot i^2 - 2 \cdot a \cdot b \cdot c \cdot d^2 \cdot g \cdot i^2 + a^2 \cdot d^3 \cdot g \cdot i^2) \cdot x) + A^2 \cdot \left( \frac{1}{(b \cdot c \cdot d - a \cdot d^2) \cdot g \cdot i^{2 \cdot x} + (b \cdot c^2 - a \cdot c \cdot d) \cdot g \cdot i^2} + b \cdot \log(b \cdot x + a) / \left( (b^2 \cdot c^2 - 2 \cdot a \cdot b \cdot c \cdot d + a^2 \cdot d^2) \cdot g \cdot i^2 \right) - b \cdot \log(d \cdot x + c) / \left( (b^2 \cdot c^2 - 2 \cdot a \cdot b \cdot c \cdot d + a^2 \cdot d^2) \cdot g \cdot i^2 \right) \right)$$

---

**Fricas [A]** time = 0.517245, size = 954, normalized size = 4.13

$$3 A^2 b c - 3 A^2 a d + \left( B^2 b d n^2 x + B^2 b c n^2 \right) \log \left( \frac{b x + a}{d x + c} \right)^3 + 6 \left( B^2 b c - B^2 a d \right) n^2 + 3 \left( B^2 b c - B^2 a d + \left( B^2 b d x + B^2 b c \right) \log \left( \frac{b x + a}{d x + c} \right) \right)$$


---

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i)^2,x, a
lgorithm="fricas")
```

```
[Out] 1/3*(3*A^2*b*c - 3*A^2*a*d + (B^2*b*d*n^2*x + B^2*b*c*n^2)*log((b*x + a)/(d
*x + c))^3 + 6*(B^2*b*c - B^2*a*d)*n^2 + 3*(B^2*b*c - B^2*a*d + (B^2*b*d*x
+ B^2*b*c)*log((b*x + a)/(d*x + c)))*log(e)^2 - 3*(B^2*a*d*n^2 - A*B*b*c*n
+ (B^2*b*d*n^2 - A*B*b*d*n)*x)*log((b*x + a)/(d*x + c))^2 - 6*(A*B*b*c - A*
B*a*d)*n + 3*(2*A*B*b*c - 2*A*B*a*d + (B^2*b*d*n*x + B^2*b*c*n)*log((b*x +
a)/(d*x + c))^2 - 2*(B^2*b*c - B^2*a*d)*n - 2*(B^2*a*d*n - A*B*b*c + (B^2*b
*d*n - A*B*b*d)*x)*log((b*x + a)/(d*x + c))*log(e) + 3*(2*B^2*a*d*n^2 - 2*
A*B*a*d*n + A^2*b*c + (2*B^2*b*d*n^2 - 2*A*B*b*d*n + A^2*b*d)*x)*log((b*x +
a)/(d*x + c)))/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*g*i^2*x + (b^2*c^3 - 2
*a*b*c^2*d + a^2*c*d^2)*g*i^2)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i)^2,x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}{(bgx + ag)(dix + ci)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i)^2,x, a
lgorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/((b*g*x + a*g)*(d*i*x +
c*i)^2), x)
```

$$3.199 \quad \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^2(ci+dix)^2} dx$$

**Optimal.** Leaf size=392

$$\frac{b^2(c+dx)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)^2}{g^2i^2(a+bx)(bc-ad)^3} - \frac{2b^2Bn(c+dx)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{g^2i^2(a+bx)(bc-ad)^3} + \frac{d^2(a+bx)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)^2}{g^2i^2(c+dx)(bc-ad)^3}$$

[Out]  $(-2*A*B*d^{2*n}*(a + b*x))/((b*c - a*d)^3*g^{2*i}^{2*(c + d*x)}) + (2*B^2*d^{2*n}^{2*(a + b*x)})/((b*c - a*d)^3*g^{2*i}^{2*(c + d*x)}) - (2*b^2*B^2*n^{2*(c + d*x)})/((b*c - a*d)^3*g^{2*i}^{2*(a + b*x)}) - (2*B^2*d^{2*n}*(a + b*x)*\text{Log}[e*((a + b*x)/(c + d*x))^n])/((b*c - a*d)^3*g^{2*i}^{2*(c + d*x)}) - (2*b^2*B*n*(c + d*x)*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^3*g^{2*i}^{2*(a + b*x)}) + (d^{2*(a + b*x)}*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^3*g^{2*i}^{2*(c + d*x)}) - (b^2*(c + d*x)*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^3*g^{2*i}^{2*(a + b*x)}) - (2*b*d*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]))^3/((3*B*(b*c - a*d)^3*g^{2*i}^{2*n})$

**Rubi [C]** time = 6.81197, antiderivative size = 1621, normalized size of antiderivative = 4.14, number of steps used = 107, number of rules used = 31, integrand size = 45,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.689$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

[In]  $\text{Int}[(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^2*(c*i + d*i*x)^2), x]$

[Out]  $(-2*b*B^2*n^{2*(c + d*x)})/((b*c - a*d)^2*g^{2*i}^{2*(a + b*x)}) - (2*B^2*d^{2*n}^{2*(a + b*x)})/((b*c - a*d)^2*g^{2*i}^{2*(c + d*x)}) - (4*b*B^2*d^{2*n}^{2*(c + d*x)}*\text{Log}[a + b*x])/((b*c - a*d)^3*g^{2*i}^{2*(a + b*x)}) + (2*A*b*B*d^{2*n}*\text{Log}[a + b*x]^2)/((b*c - a*d)^3*g^{2*i}^{2*(c + d*x)}) + (2*b*B^2*d^{2*n}*\text{Log}[-((b*c - a*d)/(d*(a + b*x))])* \text{Log}[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^3*g^{2*i}^{2*(a + b*x)}) + (2*b*B^2*d^{2*n}*\text{Log}[a + b*x]* \text{Log}[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^3*g^{2*i}^{2*(c + d*x)}) - (2*b*B*n*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^2*g^{2*i}^{2*(a + b*x)}) + (2*B*d*n*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^2*g^{2*i}^{2*(c + d*x)}) - (b*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^2*g^{2*i}^{2*(a + b*x)}) - (b*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^2*g^{2*i}^{2*(c + d*x)})$

$$\begin{aligned}
& + d*x))^{n})^2)/((b*c - a*d)^2*g^{2*i^2}*(a + b*x)) - (d*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^2*g^{2*i^2}*(c + d*x)) - (2*b*d*\text{Log}[a + b*x] * (A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^3*g^{2*i^2}) + (4*b*B^2*d*n^2*\text{Log}[c + d*x])/((b*c - a*d)^3*g^{2*i^2}) - (4*A*b*B*d*n*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/((b*c - a*d)^3*g^{2*i^2}) - (2*b*B^2*d*\text{Log}[(a + b*x)^n]^2*\text{Log}[c + d*x])/((b*c - a*d)^3*g^{2*i^2}) + (2*b*d*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2*\text{Log}[c + d*x])/((b*c - a*d)^3*g^{2*i^2}) + (2*A*b*B*d*n*\text{Log}[c + d*x]^2)/((b*c - a*d)^3*g^{2*i^2}) - (2*b*B^2*d*n^2*\text{Log}[a + b*x]*\text{Log}[c + d*x]^2)/((b*c - a*d)^3*g^{2*i^2}) + (2*b*B^2*d*n*\text{Log}[e*((a + b*x)/(c + d*x))^n]*\text{Log}[c + d*x]^2)/((b*c - a*d)^3*g^{2*i^2}) + (2*b*B^2*d*n^2*\text{Log}[c + d*x]^3)/(3*(b*c - a*d)^3*g^{2*i^2}) - (4*A*b*B*d*n*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g^{2*i^2}) + (2*b*B^2*d*\text{Log}[(a + b*x)^n]^2*\text{Log}[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g^{2*i^2}) - (4*b*B^2*d*n*\text{Log}[a + b*x]*\text{Log}[c + d*x]*\text{Log}[(c + d*x)^{-n}])/((b*c - a*d)^3*g^{2*i^2}) - (2*b*B^2*d*\text{Log}[a + b*x]*\text{Log}[(c + d*x)^{-n}]^2)/((b*c - a*d)^3*g^{2*i^2}) + (2*b*B^2*d*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[(c + d*x)^{-n}]^2)/((b*c - a*d)^3*g^{2*i^2}) + (4*b*B^2*d*n*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x]*(\text{Log}[(a + b*x)^n] - \text{Log}[e*((a + b*x)/(c + d*x))^n] + \text{Log}[(c + d*x)^{-n}]))/((b*c - a*d)^3*g^{2*i^2}) - (4*A*b*B*d*n*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^3*g^{2*i^2}) + (4*b*B^2*d*n*\text{Log}[(a + b*x)^n]*\text{PolyLog}[2, -(d*(a + b*x))/(b*c - a*d)])/((b*c - a*d)^3*g^{2*i^2}) - (4*A*b*B*d*n*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g^{2*i^2}) - (4*b*B^2*d*n*\text{Log}[(c + d*x)^{-n}]*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g^{2*i^2}) + (4*b*B^2*d*n*(\text{Log}[(a + b*x)^n] - \text{Log}[e*((a + b*x)/(c + d*x))^n] + \text{Log}[(c + d*x)^{-n}])*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g^{2*i^2}) - (4*b*B^2*d*n*\text{Log}[e*((a + b*x)/(c + d*x))^n]*\text{PolyLog}[2, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^3*g^{2*i^2}) - (4*b*B^2*d*n^2*\text{PolyLog}[3, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^3*g^{2*i^2}) - (4*b*B^2*d*n^2*\text{PolyLog}[3, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g^{2*i^2}) - (4*b*B^2*d*n^2*\text{PolyLog}[3, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^3*g^{2*i^2})
\end{aligned}$$

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

```

### Rule 2525

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||

```

IntegerQ[m]) && NeQ[m, -1]

### Rule 12

Int[(a\_)\*(u\_), x\_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b\_)\*(v\_) /; FreeQ[b, x]]

### Rule 44

Int[((a\_) + (b\_)\*(x\_))^(m\_)\*((c\_) + (d\_)\*(x\_))^(n\_), x\_Symbol] := Int[ExpandIntegrand[(a + b\*x)^m\*(c + d\*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b\*c - a\*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])

### Rule 2524

Int[((a\_) + Log[(c\_)\*(RFX\_)^(p\_)])\*(b\_)^(n\_)/((d\_) + (e\_)\*(x\_)), x\_Symbol] := Simp[(Log[d + e\*x]\*(a + b\*Log[c\*RFX^p])^n)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[d + e\*x]\*(a + b\*Log[c\*RFX^p])^(n - 1)\*D[RFX, x])/RFX, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0]

### Rule 2418

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_))^(n\_)])\*(b\_)^(p\_)\*(RFX\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n])^p, RFX, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFX, x] && IntegerQ[p]

### Rule 2390

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_))^(n\_)])\*(b\_)^(p\_)\*((f\_) + (g\_)\*(x\_))^(q\_), x\_Symbol] := Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_) + Log[(c\_)\*(x\_))^(n\_)]\*(b\_)/(x\_), x\_Symbol] := Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rule 2394

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_))^(n\_)])\*(b\_)/((f\_) + (g\_)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x)

, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))])\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] := -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rule 6688

Int[u\_, x\_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplerIntegrandQ[v, u, x]]

### Rule 6742

Int[u\_, x\_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]

### Rule 2411

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))])\*(b\_.))^(p\_.)\*((f\_.) + (g\_.)\*(x\_)^(q\_.))\*((h\_.) + (i\_.)\*(x\_)^(r\_.)), x\_Symbol] := Dist[1/e, Subst[Int[((g\*x)/e)^q\*((e\*h - d\*i)/e + (i\*x)/e)^r\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e\*f - d\*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2\*r]

### Rule 2344

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.))/((x\_)\*((d\_) + (e\_.)\*(x\_))), x\_Symbol] := Dist[1/d, Int[(a + b\*Log[c\*x^n])^p/x, x], x] - Dist[e/d, Int[(a + b\*Log[c\*x^n])^p/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

### Rule 2317

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.))/((d\_) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^p)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b

, c, d, e, n}, x] && IGtQ[p, 0]

### Rule 2507

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.)\*Log[(i\_.)\*((j\_.)\*((g\_.) + (h\_.)\*(x\_))^(t\_.))^(u\_.)]\*(v\_), x\_Symbol] := With[{k = Simplify[v\*(a + b\*x)\*(c + d\*x)]}, Simp[(k\*Log[i\*(j\*(g + h\*x)^t]^u)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s + 1))/(p\*r\*(s + 1)\*(b\*c - a\*d)), x] - Dist[(k\*h\*t\*u)/(p\*r\*(s + 1)\*(b\*c - a\*d)), Int[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s + 1)/(g + h\*x), x], x] /; FreeQ[k, x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && NeQ[s, -1]

### Rule 2488

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.)/((g\_.) + (h\_.)\*(x\_)), x\_Symbol] := -Simp[(Log[-((b\*c - a\*d)/(d\*(a + b\*x)))]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/h, x] + Dist[(p\*r\*s\*(b\*c - a\*d)/h, Int[(Log[-((b\*c - a\*d)/(d\*(a + b\*x)))]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1))/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && EqQ[b\*g - a\*h, 0] && IGtQ[s, 0]

### Rule 2506

Int[Log[v\_]\*Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.)\*(u\_), x\_Symbol] := With[{g = Simplify[((v - 1)\*(c + d\*x))/(a + b\*x)], h = Simplify[u\*(a + b\*x)\*(c + d\*x)]}, -Simp[(h\*PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/(b\*c - a\*d), x] + Dist[h\*p\*r\*s, Int[(PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1))/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]

### Rule 6610

Int[(u\_)\*PolyLog[n\_, v\_], x\_Symbol] := With[{w = DerivativeDivides[v, u\*v, x]}, Simp[w\*PolyLog[n + 1, v], x] /; !FalseQ[w]] /; FreeQ[n, x]

### Rule 2500

Int[(Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]\*(s\_.) + Log[(i\_.)\*((g\_.) + (h\_.)\*(x\_))^(n\_.)]\*(t\_.))/((j\_.) + (k\_.)\*(x\_)), x\_Symbol] := Dist[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r] - Log[(a + b\*x)^(p\*r)] - Log[(c + d\*x)^(q\*r)], Int[(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x], x] + (Int[(Log[(a + b\*x)^(p\*r)]\*(s + t\*Log[i\*(g + h\*x)^n]))/(j + k

$\ast x), x] + \text{Int}[(\text{Log}[(c + d \ast x)^{(q \ast r)}] \ast (s + t \ast \text{Log}[i \ast (g + h \ast x)^n])) / (j + k \ast x), x] /;$  FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0]

Rule 2433

$\text{Int}[(a_.) + \text{Log}[(c_.) \ast ((d_.) + (e_.) \ast (x_.))^{(n_.)}] \ast (b_.))^{(p_.)} \ast ((f_.) + \text{Log}[(h_.) \ast ((i_.) + (j_.) \ast (x_.))^{(m_.)}] \ast (g_.)) \ast ((k_.) + (l_.) \ast (x_.))^{(r_.)}, x\_Symbol] \rightarrow \text{Dist}[1/e, \text{Subst}[\text{Int}[(k \ast x)/d]^r \ast (a + b \ast \text{Log}[c \ast x^n])^p \ast (f + g \ast \text{Log}[h \ast (e \ast i - d \ast j)/e + (j \ast x)/e]^m), x], x, d + e \ast x], x] /;$  FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e\*k - d\*1, 0]

Rule 2375

$\text{Int}[(\text{Log}[(d_.) \ast ((e_.) + (f_.) \ast (x_.))^{(m_.)}])^{(r_.)} \ast ((a_.) + \text{Log}[(c_.) \ast (x_.))^{(n_.)}] \ast (b_.))^{(p_.)} / (x_), x\_Symbol] \rightarrow \text{Simp}[(\text{Log}[d \ast (e + f \ast x^m)^r] \ast (a + b \ast \text{Log}[c \ast x^n])^{(p + 1)}) / (b \ast n \ast (p + 1)), x] - \text{Dist}[(f \ast m \ast r) / (b \ast n \ast (p + 1)), \text{Int}[(x^{(m - 1)} \ast (a + b \ast \text{Log}[c \ast x^n])^{(p + 1)}) / (e + f \ast x^m), x], x] /;$  FreeQ[{a, b, c, d, e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d\*e, 1]

Rule 2374

$\text{Int}[(\text{Log}[(d_.) \ast ((e_.) + (f_.) \ast (x_.))^{(m_.)}]) \ast ((a_.) + \text{Log}[(c_.) \ast (x_.))^{(n_.)}] \ast (b_.))^{(p_.)} / (x_), x\_Symbol] \rightarrow -\text{Simp}[(\text{PolyLog}[2, -(d \ast f \ast x^m)] \ast (a + b \ast \text{Log}[c \ast x^n])^p) / m, x] + \text{Dist}[(b \ast n \ast p) / m, \text{Int}[(\text{PolyLog}[2, -(d \ast f \ast x^m)] \ast (a + b \ast \text{Log}[c \ast x^n])^{(p - 1)}) / x, x], x] /;$  FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0] && EqQ[d\*e, 1]

Rule 6589

$\text{Int}[\text{PolyLog}[n_, (c_.) \ast ((a_.) + (b_.) \ast (x_.))^{(p_.)}] / ((d_.) + (e_.) \ast (x_.)), x\_Symbol] \rightarrow \text{Simp}[\text{PolyLog}[n + 1, c \ast (a + b \ast x)^p] / (e \ast p), x] /;$  FreeQ[{a, b, c, d, e, n, p}, x] && EqQ[b\*d, a\*e]

Rule 2440

$\text{Int}[(a_.) + \text{Log}[(c_.) \ast ((d_.) + (e_.) \ast (x_.))^{(n_.)}] \ast (b_.)) \ast ((f_.) + \text{Log}[(h_.) \ast ((i_.) + (j_.) \ast (x_.))^{(m_.)}] \ast (g_.)) \ast ((k_.) + (l_.) \ast (x_.))^{(r_.)}, x\_Symbol] \rightarrow \text{Dist}[1/l, \text{Subst}[\text{Int}[x^r \ast (a + b \ast \text{Log}[c \ast ((e \ast k - d \ast 1)/l + (e \ast x)/l)^n]) \ast (f + g \ast \text{Log}[h \ast ((j \ast k - i \ast 1)/l + (j \ast x)/l)^m]), x], x, k + l \ast x], x] /;$  FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]

Rule 2434



```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
)*(i_.) + (j_.)*(x_))^(m_.)]*(g_.))/(x_), x_Symbol] := Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n]*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m))]/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]

```

### Rule 2499

```

Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*(s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/(j_.
) + (k_.)*(x_)), x_Symbol] := Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q]^r)/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]

```

### Rule 2396

```

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.)
*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]

```

### Rule 2302

```

Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)/(x_), x_Symbol] := Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
x]

```

### Rule 30

```

Int[(x_)^(m_), x_Symbol] := Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]

```

### Rubi steps

$$\begin{aligned}
\int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(199c + 199dx)^2(ag + bgx)^2} dx &= \int \left[ \frac{b^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc - ad)^2g^2(a + bx)^2} - \frac{2b^2d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc - ad)^3g^2(a + bx)} + \frac{d^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc - ad)^2g^2(c + dx)^2} \right] dx \\
&= -\frac{(2b^2d) \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx} dx}{39601(bc - ad)^3g^2} + \frac{(2bd^2) \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx} dx}{39601(bc - ad)^3g^2} + \frac{b^2 \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(a+bx)^2} dx}{39601(bc - ad)^2g^2} \\
&= -\frac{b \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc - ad)^2g^2(a + bx)} - \frac{d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc - ad)^2g^2(c + dx)} - \frac{2bd \log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc - ad)^2g^2} \\
&= -\frac{b \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc - ad)^2g^2(a + bx)} - \frac{d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc - ad)^2g^2(c + dx)} - \frac{2bd \log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc - ad)^2g^2} \\
&= -\frac{b \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc - ad)^2g^2(a + bx)} - \frac{d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc - ad)^2g^2(c + dx)} - \frac{2bd \log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc - ad)^2g^2} \\
&= -\frac{b \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc - ad)^2g^2(a + bx)} - \frac{d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc - ad)^2g^2(c + dx)} - \frac{2bd \log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{39601(bc - ad)^2g^2} \\
&= -\frac{2bBn \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{39601(bc - ad)^2g^2(a + bx)} + \frac{2Bdn \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{39601(bc - ad)^2g^2(c + dx)} - \frac{b \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{39601(bc - ad)^2g^2} \\
&= \frac{2bB^2d \log(a + bx) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{39601(bc - ad)^3g^2} - \frac{2bBn \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{39601(bc - ad)^2g^2(a + bx)} + \frac{2Bdn \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{39601(bc - ad)^2g^2} \\
&= \frac{2bB^2d \log\left(-\frac{bc-ad}{d(a+bx)}\right) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{39601(bc - ad)^3g^2} + \frac{2bB^2d \log(a + bx) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{39601(bc - ad)^3g^2} - \frac{2bBn}{39601(bc - ad)^2g^2} \\
&= -\frac{2bB^2n^2}{39601(bc - ad)^2g^2(a + bx)} - \frac{2B^2dn^2}{39601(bc - ad)^2g^2(c + dx)} - \frac{4bB^2dn^2 \log(a + bx)}{39601(bc - ad)^3g^2} + \\
&= -\frac{2bB^2n^2}{39601(bc - ad)^2g^2(a + bx)} - \frac{2B^2dn^2}{39601(bc - ad)^2g^2(c + dx)} - \frac{4bB^2dn^2 \log(a + bx)}{39601(bc - ad)^3g^2} +
\end{aligned}$$

**Mathematica [B]** time = 1.42337, size = 870, normalized size = 2.22

$$2bB^2dn^2(a+bx)(c+dx)\log^3\left(\frac{a+bx}{c+dx}\right)+3Bn\left(2Ad^2x^2b^2+Bc^2nb^2+2Acdx b^2+2Bcdnxb^2+2aAcdb+2aAd^2xb-2aB\right)$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2/((a\*g + b\*g\*x)^2\*(c\*i + d\*i\*x)^2), x]

[Out] 
$$-(2*b*B^2*d*n^2*(a+b*x)*(c+d*x)*\text{Log}[(a+b*x)/(c+d*x)]^3+3*B*n*\text{Log}[(a+b*x)/(c+d*x)]^2*(2*a*A*b*c*d+b^2*B*c^2*n-a^2*B*d^2*n+2*A*b^2*c*d*x+2*a*A*b*d^2*x+2*b^2*B*c*d*n*x-2*a*b*B*d^2*n*x+2*A*b^2*d^2*x^2+2*b*B*d*(a+b*x)*(c+d*x)*\text{Log}[e*((a+b*x)/(c+d*x))^n]-2*b*B*d*n*(a+b*x)*(c+d*x)*\text{Log}[(a+b*x)/(c+d*x)])+6*B*(b*c-a*d)*n*\text{Log}[(a+b*x)/(c+d*x)]*(A*b*c+a*A*d+b*B*c*n-a*B*d*n+2*A*b*d*x+B*(a*d+b*(c+2*d*x))*\text{Log}[e*((a+b*x)/(c+d*x))^n]-B*n*(b*c+a*d+2*b*d*x)*\text{Log}[(a+b*x)/(c+d*x)])+6*b*d*(a+b*x)*(c+d*x)*\text{Log}[a+b*x]*(A^2+2*B^2*n^2+2*A*B*(\text{Log}[e*((a+b*x)/(c+d*x))^n]-n*\text{Log}[(a+b*x)/(c+d*x)])+B^2*(\text{Log}[e*((a+b*x)/(c+d*x))^n]-n*\text{Log}[(a+b*x)/(c+d*x)])^2)+3*b*(b*c-a*d)*(c+d*x)*(A^2+2*A*B*n+2*B^2*n^2+B^2*\text{Log}[e*((a+b*x)/(c+d*x))^n]^2-2*B*n*(A+B*n)*\text{Log}[(a+b*x)/(c+d*x)]+B^2*n^2*\text{Log}[(a+b*x)/(c+d*x)]^2+2*B*\text{Log}[e*((a+b*x)/(c+d*x))^n]*(A+B*n-B*n*\text{Log}[(a+b*x)/(c+d*x)]))+3*d*(b*c-a*d)*(a+b*x)*(A^2-2*A*B*n+2*B^2*n^2+B^2*\text{Log}[e*((a+b*x)/(c+d*x))^n]^2+2*B*n*(-A+B*n)*\text{Log}[(a+b*x)/(c+d*x)]+B^2*n^2*\text{Log}[(a+b*x)/(c+d*x)]^2-2*B*\text{Log}[e*((a+b*x)/(c+d*x))^n]*(-A+B*n+B*n*\text{Log}[(a+b*x)/(c+d*x)]))-6*b*d*(a+b*x)*(c+d*x)*(A^2+2*B^2*n^2+2*A*B*(\text{Log}[e*((a+b*x)/(c+d*x))^n]-n*\text{Log}[(a+b*x)/(c+d*x)])+B^2*(\text{Log}[e*((a+b*x)/(c+d*x))^n]-n*\text{Log}[(a+b*x)/(c+d*x)])^2)*\text{Log}[c+d*x]/(3*(b*c-a*d)^3*g^2*i^2*(a+b*x)*(c+d*x))$$

**Maple [F]** time = 0.696, size = 0, normalized size = 0.

$$\int \frac{1}{(bgx+ag)^2(dix+ci)^2} \left( A + B \ln \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^2/(d\*i\*x+c\*i)^2,x)

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x)
```

**Maxima [B]** time = 1.83143, size = 2708, normalized size = 6.91

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x,
algorithm="maxima")
```

```
[Out] -B^2*((2*b*d*x + b*c + a*d)/((b^3*c^2*d - 2*a*b^2*c*d^2 + a^2*b*d^3)*g^2*i^
2*x^2 + (b^3*c^3 - a*b^2*c^2*d - a^2*b*c*d^2 + a^3*d^3)*g^2*i^2*x + (a*b^2*
c^3 - 2*a^2*b*c^2*d + a^3*c*d^2)*g^2*i^2) + 2*b*d*log(b*x + a)/((b^3*c^3 -
3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2*i^2) - 2*b*d*log(d*x + c)/((b^
3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2*i^2))*log(e*(b*x/(d*x
+ c) + a/(d*x + c))^n)^2 - 2*A*B*((2*b*d*x + b*c + a*d)/((b^3*c^2*d - 2*a*b
^2*c*d^2 + a^2*b*d^3)*g^2*i^2*x^2 + (b^3*c^3 - a*b^2*c^2*d - a^2*b*c*d^2 +
a^3*d^3)*g^2*i^2*x + (a*b^2*c^3 - 2*a^2*b*c^2*d + a^3*c*d^2)*g^2*i^2) + 2*b
*d*log(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g^2*i^
2) - 2*b*d*log(d*x + c)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3
)*g^2*i^2))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) - 2/3*((3*b^2*c^2 - 3*a^
2*d^2 + (b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(b*x + a)^3 + 3*
(b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(b*x + a)*log(d*x + c)^2
- (b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(d*x + c)^3 + 6*(b^2*
c*d - a*b*d^2)*x + 6*(b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(b*
x + a) - 3*(2*b^2*d^2*x^2 + 2*a*b*c*d + (b^2*d^2*x^2 + a*b*c*d + (b^2*c*d +
a*b*d^2)*x)*log(b*x + a)^2 + 2*(b^2*c*d + a*b*d^2)*x)*log(d*x + c))^n^2/(a
*b^3*c^4*g^2*i^2 - 3*a^2*b^2*c^3*d*g^2*i^2 + 3*a^3*b*c^2*d^2*g^2*i^2 - a^4*
c*d^3*g^2*i^2 + (b^4*c^3*d*g^2*i^2 - 3*a*b^3*c^2*d^2*g^2*i^2 + 3*a^2*b^2*c*
d^3*g^2*i^2 - a^3*b*d^4*g^2*i^2)*x^2 + (b^4*c^4*g^2*i^2 - 2*a*b^3*c^3*d*g^2
*i^2 + 2*a^3*b*c*d^3*g^2*i^2 - a^4*d^4*g^2*i^2)*x) + 3*(b^2*c^2 - 2*a*b*c*d
+ a^2*d^2 - (b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(b*x + a)^2
+ 2*(b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(b*x + a)*log(d*x +
c) - (b^2*d^2*x^2 + a*b*c*d + (b^2*c*d + a*b*d^2)*x)*log(d*x + c)^2)*n*log
(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(a*b^3*c^4*g^2*i^2 - 3*a^2*b^2*c^3*d*g^
2*i^2 + 3*a^3*b*c^2*d^2*g^2*i^2 - a^4*c*d^3*g^2*i^2 + (b^4*c^3*d*g^2*i^2 -
3*a*b^3*c^2*d^2*g^2*i^2 + 3*a^2*b^2*c*d^3*g^2*i^2 - a^3*b*d^4*g^2*i^2)*x^2
+ (b^4*c^4*g^2*i^2 - 2*a*b^3*c^3*d*g^2*i^2 + 2*a^3*b*c*d^3*g^2*i^2 - a^4*d^
4*g^2*i^2)*x))*B^2 - 2*(b^2*c^2 - 2*a*b*c*d + a^2*d^2 - (b^2*d^2*x^2 + a*b*
c*d + (b^2*c*d + a*b*d^2)*x)*log(b*x + a)^2 + 2*(b^2*d^2*x^2 + a*b*c*d + (
^2*c*d + a*b*d^2)*x)*log(b*x + a)*log(d*x + c) - (b^2*d^2*x^2 + a*b*c*d + (
```

$$b^2cd + a^2bd^2) * x) * \log(dx + c)^2 * A * B^n / (a^3c^4g^{2i^2} - 3a^2b^2c^3d^2g^{2i^2} + 3a^3b^2c^2d^2g^{2i^2} - a^4c^3d^3g^{2i^2} + (b^4c^3d^2g^{2i^2} - 3a^2b^3c^2d^2g^{2i^2} + 3a^2b^2c^3d^3g^{2i^2} - a^3b^2d^4g^{2i^2}) * x^2 + (b^4c^4g^{2i^2} - 2a^2b^3c^3d^2g^{2i^2} + 2a^3b^2c^3d^3g^{2i^2} - a^4d^4g^{2i^2}) * x) - A^2 * ((2b^2dx + bc + ad) / ((b^3c^2d - 2a^2b^2cd^2 + a^2b^2d^3) * g^{2i^2} * x^2 + (b^3c^3 - a^2b^2c^2d - a^2b^2cd^2 + a^3d^3) * g^{2i^2} * x + (a^2b^2c^3 - 2a^2b^2cd^2 + a^3cd^2) * g^{2i^2}) + 2b^2d \log(bx + a) / ((b^3c^3 - 3a^2b^2c^2d + 3a^2b^2cd^2 - a^3d^3) * g^{2i^2}) - 2b^2d \log(dx + c) / ((b^3c^3 - 3a^2b^2c^2d + 3a^2b^2cd^2 - a^3d^3) * g^{2i^2}))$$

**Fricas [B]** time = 0.585958, size = 2006, normalized size = 5.12

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^2,x,
algorithm="fricas")
```

```
[Out] -1/3*(3*A^2*b^2*c^2 - 3*A^2*a^2*d^2 + 2*(B^2*b^2*d^2*n^2*x^2 + B^2*a*b*c*d*n^2 + (B^2*b^2*c*d + B^2*a*b*d^2)*n^2*x)*log((b*x + a)/(d*x + c))^3 + 6*(B^2*b^2*c^2 - B^2*a^2*d^2)*n^2 + 3*(B^2*b^2*c^2 - B^2*a^2*d^2 + 2*(B^2*b^2*c*d - B^2*a*b*d^2)*x + 2*(B^2*b^2*d^2*x^2 + B^2*a*b*c*d + (B^2*b^2*c*d + B^2*a*b*d^2)*x)*log((b*x + a)/(d*x + c))*log(e)^2 + 3*(2*A*B*b^2*d^2*n*x^2 + 2*A*B*a*b*c*d*n + (B^2*b^2*c^2 - B^2*a^2*d^2)*n^2 + 2*((B^2*b^2*c*d - B^2*a*b*d^2)*n^2 + (A*B*b^2*c*d + A*B*a*b*d^2)*n)*x)*log((b*x + a)/(d*x + c))^2 + 6*(A*B*b^2*c^2 - 2*A*B*a*b*c*d + A*B*a^2*d^2)*n + 6*(A^2*b^2*c*d - A^2*a*b*d^2 + 2*(B^2*b^2*c*d - B^2*a*b*d^2)*n^2)*x + 6*(A*B*b^2*c^2 - A*B*a^2*d^2 + (B^2*b^2*d^2*n*x^2 + B^2*a*b*c*d*n + (B^2*b^2*c*d + B^2*a*b*d^2)*n*x)*log((b*x + a)/(d*x + c))^2 + (B^2*b^2*c^2 - 2*B^2*a*b*c*d + B^2*a^2*d^2)*n + 2*(A*B*b^2*c*d - A*B*a*b*d^2)*x + (2*A*B*b^2*d^2*x^2 + 2*A*B*a*b*c*d + (B^2*b^2*c^2 - B^2*a^2*d^2)*n + 2*(A*B*b^2*c*d + A*B*a*b*d^2 + (B^2*b^2*c*d - B^2*a*b*d^2)*n)*x)*log((b*x + a)/(d*x + c))*log(e) + 6*(A^2*a*b*c*d + (B^2*b^2*c^2 + B^2*a^2*d^2)*n^2 + (2*B^2*b^2*d^2*n^2 + A^2*b^2*d^2)*x^2 + (A*B*b^2*c^2 - A*B*a^2*d^2)*n + (A^2*b^2*c*d + A^2*a*b*d^2 + 2*(B^2*b^2*c*d + B^2*a*b*d^2)*n^2 + 2*(A*B*b^2*c*d - A*B*a*b*d^2)*n)*x)*log((b*x + a)/(d*x + c)))/(b^4*c^3*d - 3*a*b^3*c^2*d^2 + 3*a^2*b^2*c*d^3 - a^3*b*d^4)*g^{2i^2}*x^2 + (b^4*c^4 - 2*a*b^3*c^3*d + 2*a^3*b*c*d^3 - a^4*d^4)*g^{2i^2}*x + (a*b^3*c^4 - 3*a^2*b^2*c^3*d + 3*a^3*b*c^2*d^2 - a^4*c*d^3)*g^{2i^2}
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**2/(d*i*x+c*i)**2, x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2}{(bgx + ag)^2 (dix + ci)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^2, x, algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/((b*g*x + a*g)^2*(d*i*x + c*i)^2), x)
```

$$3.200 \quad \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^3(ci+dix)^2} dx$$

**Optimal.** Leaf size=560

$$\frac{b^3(c+dx)^2 \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)^2}{2g^3i^2(a+bx)^2(bc-ad)^4} - \frac{b^3Bn(c+dx)^2 \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{2g^3i^2(a+bx)^2(bc-ad)^4} + \frac{3b^2d(c+dx) \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{g^3i^2(a+bx)(bc-ad)^4}$$

[Out]  $(2ABd^3n(a+bx))/((b^2c-ad)^4g^3i^2(c+dx)) - (2B^2d^3n^2(a+bx))/((b^2c-ad)^4g^3i^2(c+dx)) + (6b^2B^2d^2n^2(c+dx))/((b^2c-ad)^4g^3i^2(a+bx)) - (b^3B^2n^2(c+dx)^2)/(4(b^2c-ad)^4g^3i^2(a+bx)^2) + (2B^2d^3n(a+bx)*\text{Log}[e((a+bx)/(c+dx))^n])/((b^2c-ad)^4g^3i^2(c+dx)) + (6b^2B^2d^2n(c+dx)*(A+B*\text{Log}[e((a+bx)/(c+dx))^n]))/((b^2c-ad)^4g^3i^2(a+bx)) - (b^3B^2n(c+dx)^2*(A+B*\text{Log}[e((a+bx)/(c+dx))^n]))/(2(b^2c-ad)^4g^3i^2(a+bx)^2) - (d^3(a+bx)*(A+B*\text{Log}[e((a+bx)/(c+dx))^n])^2)/((b^2c-ad)^4g^3i^2(c+dx)) + (3b^2d^2(c+dx)*(A+B*\text{Log}[e((a+bx)/(c+dx))^n])^2)/((b^2c-ad)^4g^3i^2(a+bx)) - (b^3(c+dx)^2*(A+B*\text{Log}[e((a+bx)/(c+dx))^n])^2)/(2(b^2c-ad)^4g^3i^2(a+bx)^2) + (b^2d^2*(A+B*\text{Log}[e((a+bx)/(c+dx))^n])^3)/(B*(b^2c-ad)^4g^3i^2n)$

**Rubi [C]** time = 8.15022, antiderivative size = 2207, normalized size of antiderivative = 3.94, number of steps used = 135, number of rules used = 31, integrand size = 45,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.689$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[e((a + bx)/(c + dx))^n])^2/((a\*g + b\*g\*x)^3\*(c\*i + d\*i\*x)^2), x]

[Out]  $-(b^2B^2n^2)/(4(b^2c-ad)^2g^3i^2(a+bx)^2) + (11b^2B^2d^2n^2)/(2(b^2c-ad)^3g^3i^2(a+bx)) + (2B^2d^2n^2)/((b^2c-ad)^3g^3i^2(c+dx)) + (15b^2B^2d^2n^2*\text{Log}[a+bx])/((2(b^2c-ad)^4g^3i^2) - (3A*b^2B^2d^2n*\text{Log}[a+bx]^2)/((b^2c-ad)^4g^3i^2) - (3b^2B^2d^2n^2*\text{Log}[a$

$$\begin{aligned}
& + b*x]^2)/(2*(b*c - a*d)^4*g^3*i^2) - (3*b*B^2*d^2*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*((a + b*x)/(c + d*x))^n]^2)/((b*c - a*d)^4*g^3*i^2) - (3*b*B^2*d^2*Log[a + b*x]*Log[e*((a + b*x)/(c + d*x))^n]^2)/((b*c - a*d)^4*g^3*i^2) - (b*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^2*g^3*i^2*(a + b*x)^2) + (5*b*B*d*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^3*g^3*i^2*(a + b*x)) - (2*B*d^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^3*g^3*i^2*(c + d*x)) + (3*b*B*d^2*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^4*g^3*i^2) - (b*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*(b*c - a*d)^2*g^3*i^2*(a + b*x)^2) + (2*b*d*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^3*g^3*i^2*(a + b*x)) + (d^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^3*g^3*i^2*(c + d*x)) + (3*b*d^2*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^4*g^3*i^2) - (15*b*B^2*d^2*n^2*Log[c + d*x])/(2*(b*c - a*d)^4*g^3*i^2) + (6*A*b*B*d^2*n*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)^4*g^3*i^2) + (3*b*B^2*d^2*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)^4*g^3*i^2) + (3*b*B^2*d^2*Log[(a + b*x)^n]^2*Log[c + d*x])/((b*c - a*d)^4*g^3*i^2) - (3*b*B^2*d^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/((b*c - a*d)^4*g^3*i^2) - (3*b*d^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[c + d*x])/((b*c - a*d)^4*g^3*i^2) - (3*b*B^2*d^2*n^2*Log[c + d*x]^2)/(2*(b*c - a*d)^4*g^3*i^2) + (3*b*B^2*d^2*n^2*Log[a + b*x]*Log[c + d*x]^2)/((b*c - a*d)^4*g^3*i^2) - (3*b*B^2*d^2*n*Log[e*((a + b*x)/(c + d*x))^n]*Log[c + d*x]^2)/((b*c - a*d)^4*g^3*i^2) - (b*B^2*d^2*n^2*Log[c + d*x]^3)/((b*c - a*d)^4*g^3*i^2) + (6*A*b*B*d^2*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^3*i^2) + (3*b*B^2*d^2*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^3*i^2) - (3*b*B^2*d^2*Log[(a + b*x)^n]^2*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^3*i^2) + (6*b*B^2*d^2*n*Log[a + b*x]*Log[c + d*x]*Log[(c + d*x)^(-n)])/((b*c - a*d)^4*g^3*i^2) + (3*b*B^2*d^2*Log[a + b*x]*Log[(c + d*x)^(-n)]^2)/((b*c - a*d)^4*g^3*i^2) - (3*b*B^2*d^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^(-n)]^2)/((b*c - a*d)^4*g^3*i^2) - (6*b*B^2*d^2*n*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x]*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)]))/((b*c - a*d)^4*g^3*i^2) + (6*A*b*B*d^2*n*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^4*g^3*i^2) + (3*b*B^2*d^2*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^4*g^3*i^2) - (6*b*B^2*d^2*n*Log[(a + b*x)^n]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^4*g^3*i^2) + (6*A*b*B*d^2*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^3*i^2) + (3*b*B^2*d^2*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^3*i^2) + (6*b*B^2*d^2*n*Log[(c + d*x)^(-n)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^3*i^2) - (6*b*B^2*d^2*n*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)])*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^4*g^3*i^2) + (6*b*B^2*d^2*n*Log[e*((a + b*x)/(c + d*x))^n]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^4*g^3*i^2) + (6*b*B^2*d^2*n^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^4*g^3*i^2) + (6*b*B^2*d^2*n^2*PolyLog[3, (b*(c + d*x))/(b*c -
\end{aligned}$$



$$\frac{a*d]}{((b*c - a*d)^4*g^3*i^2) + (6*b*B^2*d^2*n^2*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x)])/(b*c - a*d)^4*g^3*i^2)}$$

### Rule 2528

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*(RGx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

### Rule 2525

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*((d\_.) + (e\_.)\*(x\_))^(m\_.), x\_Symbol] := Simp[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^n)/(e\*(m + 1)), x] - Dist[(b\*n\*p)/(e\*(m + 1)), Int[SimplifyIntegrand[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

### Rule 12

Int[(a\_)\*(u\_), x\_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b\_)\*(v\_) /; FreeQ[b, x]]

### Rule 44

Int[((a\_) + (b\_.)\*(x\_))^(m\_.)\*((c\_.) + (d\_.)\*(x\_))^(n\_.), x\_Symbol] := Int[ExpandIntegrand[(a + b\*x)^m\*(c + d\*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b\*c - a\*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])

### Rule 2524

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^n)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

### Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*(RFx\_), x\_Symbol] := With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x
), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] := Dist[1/e, Subst[Int
```

```

[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]

```

### Rule 2344

```

Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^p_/((x_)*((d_) + (e_.)*(x_))),
  x_Symbol] := Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]

```

### Rule 2317

```

Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^p_/((d_) + (e_.)*(x_)), x_Symb
ol] := Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
  Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]

```

### Rule 2507

```

Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] := With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s + 1))/(p*r*(s + 1)*(b*c
- a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q]^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
EqQ[p + q, 0] && NeQ[s, -1]

```

### Rule 2488

```

Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] := -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q]^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]

```

### Rule 2506

```

Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_
))^(q_.)]^(r_.)]^(s_.)*(u_), x_Symbol] := With[{g = Simplify[(v - 1)*(c + d
*x)/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/(b*c - a*d), x] + Dist[h*p*r

```

\*s, Int[(PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1))/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]

### Rule 6610

Int[(u\_)\*PolyLog[n\_, v\_], x\_Symbol] := With[{w = DerivativeDivides[v, u\*v, x]}, Simp[w\*PolyLog[n + 1, v], x] /; !FalseQ[w]] /; FreeQ[n, x]

### Rule 2500

Int[(Log[(e\_)\*((f\_)\*((a\_) + (b\_)\*(x\_))^(p\_))\*((c\_) + (d\_)\*(x\_))^(q\_))]^(r\_)]\*((s\_) + Log[(i\_)\*((g\_) + (h\_)\*(x\_))^(n\_)]\*(t\_)))/((j\_) + (k\_)\*(x\_)), x\_Symbol] := Dist[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r] - Log[(a + b\*x)^(p\*r)] - Log[(c + d\*x)^(q\*r)], Int[(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x], x] + (Int[(Log[(a + b\*x)^(p\*r)]\*(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x] + Int[(Log[(c + d\*x)^(q\*r)]\*(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0]

### Rule 2433

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_))^(n\_)]\*(b\_))]^(p\_)\*((f\_) + Log[(h\_)\*((i\_) + (j\_)\*(x\_))^(m\_)]\*(g\_))\*((k\_) + (l\_)\*(x\_))^(r\_), x\_Symbol] := Dist[1/e, Subst[Int[((k\*x)/d)^r\*(a + b\*Log[c\*x^n])^p\*(f + g\*Log[h\*(e\*i - d\*j)/e + (j\*x)/e]^m)], x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e\*k - d\*l, 0]

### Rule 2375

Int[(Log[(d\_)\*((e\_) + (f\_)\*(x\_))^(m\_))]^(r\_)]\*((a\_) + Log[(c\_)\*(x\_))^(n\_)]\*(b\_))]^(p\_))/(x\_), x\_Symbol] := Simp[(Log[d\*(e + f\*x^m)^r]\*(a + b\*Log[c\*x^n])^(p + 1))/(b\*n\*(p + 1)), x] - Dist[(f\*m\*r)/(b\*n\*(p + 1)), Int[(x^(m - 1)\*(a + b\*Log[c\*x^n])^(p + 1))/(e + f\*x^m), x], x] /; FreeQ[{a, b, c, d, e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d\*e, 1]

### Rule 2374

Int[(Log[(d\_)\*((e\_) + (f\_)\*(x\_))^(m\_))]\*(a\_) + Log[(c\_)\*(x\_))^(n\_)]\*(b\_))]^(p\_))/(x\_), x\_Symbol] := -Simp[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^p)/m, x] + Dist[(b\*n\*p)/m, Int[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0] && EqQ[d\*e, 1]

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_Symbol]
:> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d, e, n, p}, x]
&& EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol]
:> Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n)]*(f +
g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, m, n}, x]
&& IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol]
:> Simp[Log[x]*(a + b*Log[c*(d + e*x)^n)]*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Log[x]
*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x]
*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, m, n}, x]
&& EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/(j_.)
+ (k_.)*(x_)), x_Symbol]
:> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r)/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dist[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x]
&& NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.)
*(x_)), x_Symbol]
:> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p}, x]
&& NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_))^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol]
:> Dist[1/(
```

$b \cdot n$ ), Subst[Int[x<sup>p</sup>, x], x, a + b\*Log[c\*x<sup>n</sup>]], x] /; FreeQ[{a, b, c, n, p}, x]

### Rule 30

Int[(x\_)<sup>(m\_.)</sup>, x\_Symbol] :> Simp[x<sup>(m + 1)</sup>/(m + 1), x] /; FreeQ[m, x] && NeQ[m, -1]

### Rubi steps

$$\begin{aligned}
\int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(200c + 200dx)^2(ag + bgx)^3} dx &= \int \left( \frac{b^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{40000(bc - ad)^2 g^3 (a + bx)^3} - \frac{b^2 d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{20000(bc - ad)^3 g^3 (a + bx)^2} + \frac{3b^2 d^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{40000(bc - ad)^4 g^3} \right) dx \\
&= \frac{(3b^2 d^2) \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx} dx}{40000(bc - ad)^4 g^3} - \frac{(3bd^3) \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx} dx}{40000(bc - ad)^4 g^3} - \frac{(b^2 d) \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx} dx}{20000(bc - ad)^3 g^3} \\
&= -\frac{b \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{80000(bc - ad)^2 g^3 (a + bx)^2} + \frac{bd \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{20000(bc - ad)^3 g^3 (a + bx)} + \frac{d^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{40000(bc - ad)^3 g^3} \\
&= -\frac{b \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{80000(bc - ad)^2 g^3 (a + bx)^2} + \frac{bd \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{20000(bc - ad)^3 g^3 (a + bx)} + \frac{d^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{40000(bc - ad)^3 g^3} \\
&= -\frac{b \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{80000(bc - ad)^2 g^3 (a + bx)^2} + \frac{bd \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{20000(bc - ad)^3 g^3 (a + bx)} + \frac{d^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{40000(bc - ad)^3 g^3} \\
&= -\frac{b \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{80000(bc - ad)^2 g^3 (a + bx)^2} + \frac{bd \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{20000(bc - ad)^3 g^3 (a + bx)} + \frac{d^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{40000(bc - ad)^3 g^3} \\
&= -\frac{bBn \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{80000(bc - ad)^2 g^3 (a + bx)^2} + \frac{bBdn \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8000(bc - ad)^3 g^3 (a + bx)} - \frac{Bd^2 n \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{20000(bc - ad)^3 g^3} \\
&= -\frac{3bB^2 d^2 \log(a + bx) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{40000(bc - ad)^4 g^3} - \frac{bBn \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{80000(bc - ad)^2 g^3 (a + bx)^2} + \frac{bBdn \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8000(bc - ad)^3 g^3} \\
&= -\frac{3bB^2 d^2 \log\left(-\frac{bc-ad}{d(a+bx)}\right) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{40000(bc - ad)^4 g^3} - \frac{3bB^2 d^2 \log(a + bx) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{40000(bc - ad)^4 g^3} + \frac{bBdn \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8000(bc - ad)^3 g^3} \\
&= -\frac{bB^2 n^2}{160000(bc - ad)^2 g^3 (a + bx)^2} + \frac{11bB^2 dn^2}{80000(bc - ad)^3 g^3 (a + bx)} + \frac{B^2 d^2 n^2}{20000(bc - ad)^3 g^3} \\
&= -\frac{bB^2 n^2}{160000(bc - ad)^2 g^3 (a + bx)^2} + \frac{11bB^2 dn^2}{80000(bc - ad)^3 g^3 (a + bx)} + \frac{B^2 d^2 n^2}{20000(bc - ad)^3 g^3}
\end{aligned}$$

**Mathematica [B]** time = 2.03362, size = 1340, normalized size = 2.39

$$4bB^2d^2n^2(a+bx)^2(c+dx)\log^3\left(\frac{a+bx}{c+dx}\right) + 2Bn\left(6Ad^3x^3b^3 + 3Bd^3nx^3b^3 + 6Acd^2x^2b^3 + 9Bcd^2nx^2b^3 - Bc^3nb^3 + 3Bc^2dnxb\right)$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2/((a\*g + b\*g\*x)^3\*(c\*i + d\*i\*x)^2), x]

[Out] (4\*b\*B^2\*d^2\*n^2\*(a + b\*x)^2\*(c + d\*x)\*Log[(a + b\*x)/(c + d\*x)]^3 + 2\*B\*n\*Log[(a + b\*x)/(c + d\*x)]^2\*(6\*a^2\*A\*b\*c\*d^2 - b^3\*B\*c^3\*n + 6\*a\*b^2\*B\*c^2\*d\*n - 2\*a^3\*B\*d^3\*n + 12\*a\*A\*b^2\*c\*d^2\*x + 6\*a^2\*A\*b\*d^3\*x + 3\*b^3\*B\*c^2\*d\*n\*x + 12\*a\*b^2\*B\*c\*d^2\*n\*x - 6\*a^2\*b\*B\*d^3\*n\*x + 6\*A\*b^3\*c\*d^2\*x^2 + 12\*a\*A\*b^2\*d^3\*x^2 + 9\*b^3\*B\*c\*d^2\*n\*x^2 + 6\*A\*b^3\*d^3\*x^3 + 3\*b^3\*B\*d^3\*n\*x^3 + 6\*b\*B\*d^2\*(a + b\*x)^2\*(c + d\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n] - 6\*b\*B\*d^2\*n\*(a + b\*x)^2\*(c + d\*x)\*Log[(a + b\*x)/(c + d\*x)]) + 2\*b\*d\*(b\*c - a\*d)\*(a + b\*x)\*(c + d\*x)\*(4\*A^2 + 10\*A\*B\*n + 11\*B^2\*n^2 + 4\*B^2\*Log[e\*((a + b\*x)/(c + d\*x))^n]^2 - 2\*B\*n\*(4\*A + 5\*B\*n)\*Log[(a + b\*x)/(c + d\*x)] + 4\*B^2\*n^2\*Log[(a + b\*x)/(c + d\*x)]^2 + 2\*B\*Log[e\*((a + b\*x)/(c + d\*x))^n]\*(4\*A + 5\*B\*n - 4\*B\*n\*Log[(a + b\*x)/(c + d\*x)])) - b\*(b\*c - a\*d)^2\*(c + d\*x)\*(2\*A^2 + 2\*A\*B\*n + B^2\*n^2 + 2\*B^2\*Log[e\*((a + b\*x)/(c + d\*x))^n]^2 - 2\*B\*n\*(2\*A + B\*n)\*Log[(a + b\*x)/(c + d\*x)] + 2\*B^2\*n^2\*Log[(a + b\*x)/(c + d\*x)]^2 + 2\*B\*Log[e\*((a + b\*x)/(c + d\*x))^n]\*(2\*A + B\*n - 2\*B\*n\*Log[(a + b\*x)/(c + d\*x)])) + 6\*b\*d^2\*(a + b\*x)^2\*(c + d\*x)\*Log[a + b\*x]\*(2\*A^2 + 2\*A\*B\*n + 5\*B^2\*n^2 + 2\*B^2\*Log[e\*((a + b\*x)/(c + d\*x))^n]^2 - 2\*B\*n\*(2\*A + B\*n)\*Log[(a + b\*x)/(c + d\*x)] + 2\*B^2\*n^2\*Log[(a + b\*x)/(c + d\*x)]^2 + 2\*B\*Log[e\*((a + b\*x)/(c + d\*x))^n]\*(2\*A + B\*n - 2\*B\*n\*Log[(a + b\*x)/(c + d\*x)])) + 2\*B\*(b\*c - a\*d)\*n\*Log[(a + b\*x)/(c + d\*x)]\*(2\*b\*d\*(a + b\*x)\*(c + d\*x)\*(4\*A + 5\*B\*n + 4\*B\*Log[e\*((a + b\*x)/(c + d\*x))^n] - 4\*B\*n\*Log[(a + b\*x)/(c + d\*x)]) - b\*(b\*c - a\*d)\*(c + d\*x)\*(2\*A + B\*n + 2\*B\*Log[e\*((a + b\*x)/(c + d\*x))^n] - 2\*B\*n\*Log[(a + b\*x)/(c + d\*x)]) + 4\*d^2\*(a + b\*x)^2\*(A - B\*n + B\*Log[e\*((a + b\*x)/(c + d\*x))^n] - B\*n\*Log[(a + b\*x)/(c + d\*x)]) + 4\*d^2\*(b\*c - a\*d)\*(a + b\*x)^2\*(A^2 - 2\*A\*B\*n + 2\*B^2\*n^2 + B^2\*Log[e\*((a + b\*x)/(c + d\*x))^n]^2 + 2\*B\*n\*(-A + B\*n)\*Log[(a + b\*x)/(c + d\*x)] + B^2\*n^2\*Log[(a + b\*x)/(c + d\*x)]^2 - 2\*B\*Log[e\*((a + b\*x)/(c + d\*x))^n]\*(-A + B\*n + B\*n\*Log[(a + b\*x)/(c + d\*x)])) - 6\*b\*d^2\*(a + b\*x)^2\*(c + d\*x)\*(2\*A^2 + 2\*A\*B\*n + 5\*B^2\*n^2 + 2\*B^2\*Log[e\*((a + b\*x)/(c + d\*x))^n]^2 - 2\*B\*n\*(2\*A + B\*n)\*Log[(a + b\*x)/(c + d\*x)] + 2\*B^2\*n^2\*Log[(a + b\*x)/(c + d\*x)]^2 + 2\*B\*Log[e\*((a + b\*x)/(c + d\*x))^n]\*(2\*A + B\*n - 2\*B\*n\*Log[(a + b\*x)/(c + d\*x)]))\*Log[c + d\*x]/(4\*(b\*c - a\*d)^4\*g^3\*i^2\*(a + b\*x)^2\*(c + d\*x))







$$\begin{aligned}
& *a*b^2*c*d^2 + a^2*b*d^3)*x)*\log(b*x + a))*\log(d*x + c))*A*B*n/(a^2*b^4*c^5 \\
& *g^3*i^2 - 4*a^3*b^3*c^4*d*g^3*i^2 + 6*a^4*b^2*c^3*d^2*g^3*i^2 - 4*a^5*b*c^2 \\
& *d^3*g^3*i^2 + a^6*c*d^4*g^3*i^2 + (b^6*c^4*d*g^3*i^2 - 4*a*b^5*c^3*d^2*g^ \\
& 3*i^2 + 6*a^2*b^4*c^2*d^3*g^3*i^2 - 4*a^3*b^3*c*d^4*g^3*i^2 + a^4*b^2*d^5*g \\
& ^3*i^2)*x^3 + (b^6*c^5*g^3*i^2 - 2*a*b^5*c^4*d*g^3*i^2 - 2*a^2*b^4*c^3*d^2* \\
& g^3*i^2 + 8*a^3*b^3*c^2*d^3*g^3*i^2 - 7*a^4*b^2*c*d^4*g^3*i^2 + 2*a^5*b*d^5 \\
& *g^3*i^2)*x^2 + (2*a*b^5*c^5*g^3*i^2 - 7*a^2*b^4*c^4*d*g^3*i^2 + 8*a^3*b^3* \\
& c^3*d^2*g^3*i^2 - 2*a^4*b^2*c^2*d^3*g^3*i^2 - 2*a^5*b*c*d^4*g^3*i^2 + a^6*d \\
& ^5*g^3*i^2)*x) + 1/2*A^2*((b*b^2*d^2*x^2 - b^2*c^2 + 5*a*b*c*d + 2*a^2*d^2 \\
& + 3*(b^2*c*d + 3*a*b*d^2)*x)/((b^5*c^3*d - 3*a*b^4*c^2*d^2 + 3*a^2*b^3*c*d^ \\
& 3 - a^3*b^2*d^4)*g^3*i^2*x^3 + (b^5*c^4 - a*b^4*c^3*d - 3*a^2*b^3*c^2*d^2 + \\
& 5*a^3*b^2*c*d^3 - 2*a^4*b*d^4)*g^3*i^2*x^2 + (2*a*b^4*c^4 - 5*a^2*b^3*c^3* \\
& d + 3*a^3*b^2*c^2*d^2 + a^4*b*c*d^3 - a^5*d^4)*g^3*i^2*x + (a^2*b^3*c^4 - 3 \\
& *a^3*b^2*c^3*d + 3*a^4*b*c^2*d^2 - a^5*c*d^3)*g^3*i^2) + 6*b*d^2*\log(b*x + \\
& a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4) \\
& *g^3*i^2) - 6*b*d^2*\log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2* \\
& d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^3*i^2))
\end{aligned}$$

**Fricas [B]** time = 0.716624, size = 4177, normalized size = 7.46

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^3/(d\*i\*x+c\*i)^2,x,  
algorithm="fricas")

[Out] 
$$\begin{aligned}
& -1/4*(2*A^2*b^3*c^3 - 12*A^2*a*b^2*c^2*d + 6*A^2*a^2*b*c*d^2 + 4*A^2*a^3*d^ \\
& 3 - 4*(B^2*b^3*d^3*n^2*x^3 + B^2*a^2*b*c*d^2*n^2 + (B^2*b^3*c*d^2 + 2*B^2*a \\
& *b^2*d^3)*n^2*x^2 + (2*B^2*a*b^2*c*d^2 + B^2*a^2*b*d^3)*n^2*x)*\log((b*x + a \\
& )/(d*x + c))^3 + (B^2*b^3*c^3 - 24*B^2*a*b^2*c^2*d + 15*B^2*a^2*b*c*d^2 + 8 \\
& *B^2*a^3*d^3)*n^2 - 6*(2*A^2*b^3*c*d^2 - 2*A^2*a*b^2*d^3 + 5*(B^2*b^3*c*d^2 \\
& - B^2*a*b^2*d^3)*n^2 + 2*(A*B*b^3*c*d^2 - A*B*a*b^2*d^3)*n)*x^2 + 2*(B^2*b \\
& ^3*c^3 - 6*B^2*a*b^2*c^2*d + 3*B^2*a^2*b*c*d^2 + 2*B^2*a^3*d^3 - 6*(B^2*b^3 \\
& *c*d^2 - B^2*a*b^2*d^3)*x^2 - 3*(B^2*b^3*c^2*d + 2*B^2*a*b^2*c*d^2 - 3*B^2* \\
& a^2*b*d^3)*x - 6*(B^2*b^3*d^3*x^3 + B^2*a^2*b*c*d^2 + (B^2*b^3*c*d^2 + 2*B^ \\
& 2*a*b^2*d^3)*x^2 + (2*B^2*a*b^2*c*d^2 + B^2*a^2*b*d^3)*x)*\log((b*x + a)/(d \\
& x + c))*\log(e)^2 - 2*(6*A*B*a^2*b*c*d^2*n + 3*(B^2*b^3*d^3*n^2 + 2*A*B*b^3 \\
& *d^3*n)*x^3 - (B^2*b^3*c^3 - 6*B^2*a*b^2*c^2*d + 2*B^2*a^3*d^3)*n^2 + 3*(3* \\
& B^2*b^3*c*d^2*n^2 + 2*(A*B*b^3*c*d^2 + 2*A*B*a*b^2*d^3)*n)*x^2 + 3*((B^2*b^ \\
& 3*c^2*d + 4*B^2*a*b^2*c*d^2 - 2*B^2*a^2*b*d^3)*n^2 + 2*(2*A*B*a*b^2*c*d^2 + \\
& A*B*a^2*b*d^3)*n)*x)*\log((b*x + a)/(d*x + c))^2 + 2*(A*B*b^3*c^3 - 12*A*B*
\end{aligned}$$

$$\begin{aligned}
& a^2 b^2 c^2 d + 15 A B a^2 b^2 c^2 d^2 - 4 A B a^3 d^3) n - 3 (2 A^2 b^3 c^2 d + 4 A^2 a b^2 c^2 d^2 - 6 A^2 a^2 b^2 d^3 + (7 B^2 b^3 c^2 d + 6 B^2 a b^2 c^2 d^2 \\
& - 13 B^2 a^2 b^2 d^3) n^2 + 2 (3 A B b^3 c^2 d - 2 A B a b^2 c^2 d^2 - A B a^2 b^2 d^3) n) x + 2 (2 A B b^3 c^3 - 12 A B a b^2 c^2 d + 6 A B a^2 b^2 c^2 d^2 + 4 \\
& A B a^3 d^3 - 6 (2 A B b^3 c^2 d^2 - 2 A B a b^2 d^3 + (B^2 b^3 c^2 d^2 - B^2 a b^2 d^3) n) x^2 - 6 (B^2 b^3 d^3 n x^3 + B^2 a^2 b^2 c^2 d^2 n + (B^2 b^3 c^2 d^2 \\
& + 2 B^2 a b^2 d^3) n x^2 + (2 B^2 a b^2 c^2 d^2 + B^2 a^2 b^2 d^3) n x) \log((b x + a)/(d x + c))^2 + (B^2 b^3 c^3 - 12 B^2 a b^2 c^2 d + 15 B^2 a^2 b^2 c^2 d^2 \\
& - 4 B^2 a^3 d^3) n - 3 (2 A B b^3 c^2 d + 4 A B a b^2 c^2 d^2 - 6 A B a^2 b^2 d^3 + (3 B^2 b^3 c^2 d - 2 B^2 a b^2 c^2 d^2 - B^2 a^2 b^2 d^3) n) x - 2 (6 \\
& A B a^2 b^2 c^2 d + 3 (B^2 b^3 d^3 n + 2 A B b^3 d^3) x^3 + 3 (3 B^2 b^3 c^2 d^2 n + 2 A B b^3 c^2 d^2 + 4 A B a b^2 d^3) x^2 - (B^2 b^3 c^3 - 6 B^2 a b^2 c^2 d + 2 B^2 a^3 d^3) n \\
& + 3 (4 A B a b^2 c^2 d^2 + 2 A B a^2 b^2 d^3 + (B^2 b^3 c^2 d + 4 B^2 a b^2 c^2 d^2 - 2 B^2 a^2 b^2 d^3) n) x) \log((b x + a)/(d x + c)) \log(e) - 2 (6 A^2 a^2 b^2 c^2 d^2 + 3 (5 B^2 b^3 d^3 n^2 + 2 A B b^3 d^3 n \\
& + 2 A^2 b^3 d^3) x^3 - (B^2 b^3 c^3 - 12 B^2 a b^2 c^2 d - 4 B^2 a^3 d^3) n^2 + 3 (6 A B b^3 c^2 d^2 n + 2 A^2 b^3 c^2 d^2 + 4 A^2 a b^2 d^3 + (7 B^2 b^3 c^2 d^2 + 8 B^2 a b^2 d^3) n^2) x^2 - 2 (A B b^3 c^3 - 6 A B a b^2 c^2 d + 2 \\
& A B a^3 d^3) n + 3 (4 A^2 a b^2 c^2 d^2 + 2 A^2 a^2 b^2 d^3 + (3 B^2 b^3 c^2 d + 8 B^2 a b^2 c^2 d^2 + 4 B^2 a^2 b^2 d^3) n^2 + 2 (A B b^3 c^2 d + 4 A B a b^2 c^2 d^2 - 2 A B a^2 b^2 d^3) n) x) \log((b x + a)/(d x + c)) / ((b^6 c^4 d - 4 a \\
& b^5 c^3 d^2 + 6 a^2 b^4 c^2 d^3 - 4 a^3 b^3 c^2 d^4 + a^4 b^2 d^5) g^3 i^2 x^3 + (b^6 c^5 - 2 a b^5 c^4 d - 2 a^2 b^4 c^3 d^2 + 8 a^3 b^3 c^2 d^3 - 7 a^4 b^2 c^2 d^4 + 2 a^5 b^2 d^5) g^3 i^2 x^2 + (2 a b^5 c^5 - 7 a^2 b^4 c^4 d + 8 a^3 b^3 c^3 d^2 - 2 a^4 b^2 c^2 d^3 - 2 a^5 b^2 c^2 d^4 + a^6 d^5) g^3 i^2 x \\
& + (a^2 b^4 c^5 - 4 a^3 b^3 c^4 d + 6 a^4 b^2 c^3 d^2 - 4 a^5 b^2 c^2 d^3 + a^6 c^2 d^4) g^3 i^2)
\end{aligned}$$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**3/(d*i*x+c*i)**2, x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2}{(bgx + ag)^3 (dix + ci)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^2,x,
algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/((b*g*x + a*g)^3*(d*i*x
+ c*i)^2), x)
```

$$3.201 \quad \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^4(ci+dix)^2} dx$$

**Optimal.** Leaf size=729

$$\frac{6b^2d^2(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{g^4i^2(a+bx)(bc-ad)^5} - \frac{12b^2Bd^2n(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^4i^2(a+bx)(bc-ad)^5} - \frac{b^4(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3g^4i^2(a+bx)^3(bc-ad)^5}$$

```
[Out] (-2*A*B*d^4*n*(a + b*x))/((b*c - a*d)^5*g^4*i^2*(c + d*x)) + (2*B^2*d^4*n^2*(a + b*x))/((b*c - a*d)^5*g^4*i^2*(c + d*x)) - (12*b^2*B^2*d^2*n^2*(c + d*x))/((b*c - a*d)^5*g^4*i^2*(a + b*x)) + (b^3*B^2*d*n^2*(c + d*x)^2)/((b*c - a*d)^5*g^4*i^2*(a + b*x)^2) - (2*b^4*B^2*n^2*(c + d*x)^3)/(27*(b*c - a*d)^5*g^4*i^2*(a + b*x)^3) - (2*B^2*d^4*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/((b*c - a*d)^5*g^4*i^2*(c + d*x)) - (12*b^2*B*d^2*n*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^5*g^4*i^2*(a + b*x)) + (2*b^3*B*d*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^5*g^4*i^2*(a + b*x)^2) - (2*b^4*B*n*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(9*(b*c - a*d)^5*g^4*i^2*(a + b*x)^3) + (d^4*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^5*g^4*i^2*(c + d*x)) - (6*b^2*d^2*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^5*g^4*i^2*(a + b*x)) + (2*b^3*d*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^5*g^4*i^2*(a + b*x)^2) - (b^4*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(3*(b*c - a*d)^5*g^4*i^2*(a + b*x)^3) - (4*b*d^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^3)/(3*B*(b*c - a*d)^5*g^4*i^2*n)
```

**Rubi [C]** time = 9.29131, antiderivative size = 2368, normalized size of antiderivative = 3.25, number of steps used = 167, number of rules used = 31, integrand size = 45,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.689$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^4*(c*i + d*i*x)^2), x]
```

```
[Out] (-2*b*B^2*n^2)/(27*(b*c - a*d)^2*g^4*i^2*(a + b*x)^3) + (7*b*B^2*d*n^2)/(9*(b*c - a*d)^3*g^4*i^2*(a + b*x)^2) - (92*b*B^2*d^2*n^2)/(9*(b*c - a*d)^4*g^4*i^2*(a + b*x))
```

$$\begin{aligned}
& 4i^2(a + bx) - (2B^2d^3n^2)/((b^2c - a^2d)^4g^4i^2(c + dx)) - (110 \\
& *bB^2d^3n^2\text{Log}[a + bx])/((9(b^2c - a^2d)^5g^4i^2) + (4A*bB^2d^3n\text{Log} \\
& [a + bx]^2)/((b^2c - a^2d)^5g^4i^2) + (10*bB^2d^3n^2\text{Log}[a + bx]^2)/(3 \\
& *(b^2c - a^2d)^5g^4i^2) + (4*bB^2d^3\text{Log}[-((b^2c - a^2d)/(d*(a + bx)))]*Lo \\
& g[e*((a + bx)/(c + dx))^n]^2)/((b^2c - a^2d)^5g^4i^2) + (4*bB^2d^3\text{Log}[ \\
& a + bx]*\text{Log}[e*((a + bx)/(c + dx))^n]^2)/((b^2c - a^2d)^5g^4i^2) - (2*bB \\
& *n*(A + B*\text{Log}[e*((a + bx)/(c + dx))^n]))/(9(b^2c - a^2d)^2g^4i^2*(a + b \\
& x)^3) + (4*bB*d*n*(A + B*\text{Log}[e*((a + bx)/(c + dx))^n]))/(3*(b^2c - a^2d)^3 \\
& *g^4i^2*(a + bx)^2) - (26*bB*d^2*n*(A + B*\text{Log}[e*((a + bx)/(c + dx))^n] \\
& ))/(3*(b^2c - a^2d)^4g^4i^2*(a + bx)) + (2*B*d^3*n*(A + B*\text{Log}[e*((a + bx) \\
& / (c + dx))^n]))/(b^2c - a^2d)^4g^4i^2*(c + dx) - (20*bB*d^3*n*\text{Log}[a + \\
& bx]*(A + B*\text{Log}[e*((a + bx)/(c + dx))^n]))/(3*(b^2c - a^2d)^5g^4i^2) - (b \\
& *(A + B*\text{Log}[e*((a + bx)/(c + dx))^n])^2)/(3*(b^2c - a^2d)^2g^4i^2*(a + b \\
& x)^3) + (b*d*(A + B*\text{Log}[e*((a + bx)/(c + dx))^n])^2)/((b^2c - a^2d)^3g^4i \\
& ^2*(a + bx)^2) - (3*b*d^2*(A + B*\text{Log}[e*((a + bx)/(c + dx))^n])^2)/((b^2c \\
& - a^2d)^4g^4i^2*(a + bx)) - (d^3*(A + B*\text{Log}[e*((a + bx)/(c + dx))^n])^2 \\
& )/((b^2c - a^2d)^4g^4i^2*(c + dx)) - (4*b*d^3*\text{Log}[a + bx]*(A + B*\text{Log}[e*(( \\
& a + bx)/(c + dx))^n])^2)/((b^2c - a^2d)^5g^4i^2) + (110*bB^2d^3n^2*\text{Log} \\
& [c + dx])/((9(b^2c - a^2d)^5g^4i^2) - (8A*bB^2d^3n*\text{Log}[-((d*(a + bx))/( \\
& b^2c - a^2d))]*\text{Log}[c + dx])/((b^2c - a^2d)^5g^4i^2) - (20*bB^2d^3n^2*\text{Log}[ \\
& -((d*(a + bx))/(b^2c - a^2d))]*\text{Log}[c + dx])/((3*(b^2c - a^2d)^5g^4i^2) - (4* \\
& bB^2d^3*\text{Log}[(a + bx)^n]^2*\text{Log}[c + dx])/((b^2c - a^2d)^5g^4i^2) + (20*bB \\
& *d^3*n*(A + B*\text{Log}[e*((a + bx)/(c + dx))^n])*\text{Log}[c + dx])/((3*(b^2c - a^2d) \\
& ^5g^4i^2) + (4*b*d^3*(A + B*\text{Log}[e*((a + bx)/(c + dx))^n])^2*\text{Log}[c + dx \\
& ])/((b^2c - a^2d)^5g^4i^2) + (4A*bB^2d^3n*\text{Log}[c + dx]^2)/((b^2c - a^2d)^5g \\
& ^4i^2) + (10*bB^2d^3n^2*\text{Log}[c + dx]^2)/(3*(b^2c - a^2d)^5g^4i^2) - (4 \\
& *bB^2d^3n^2*\text{Log}[a + bx]*\text{Log}[c + dx]^2)/((b^2c - a^2d)^5g^4i^2) + (4*bB \\
& ^2d^3n*\text{Log}[e*((a + bx)/(c + dx))^n]*\text{Log}[c + dx]^2)/((b^2c - a^2d)^5g^4 \\
& *i^2) + (4*bB^2d^3n^2*\text{Log}[c + dx]^3)/(3*(b^2c - a^2d)^5g^4i^2) - (8A*b \\
& *B^2d^3n*\text{Log}[a + bx]*\text{Log}[(b*(c + dx))/(b^2c - a^2d)]/((b^2c - a^2d)^5g^4i^ \\
& 2) - (20*bB^2d^3n^2*\text{Log}[a + bx]*\text{Log}[(b*(c + dx))/(b^2c - a^2d)]/((3*(b^2c \\
& - a^2d)^5g^4i^2) + (4*bB^2d^3*\text{Log}[(a + bx)^n]^2*\text{Log}[(b*(c + dx))/(b^2c \\
& - a^2d)]/((b^2c - a^2d)^5g^4i^2) - (8*bB^2d^3n*\text{Log}[a + bx]*\text{Log}[c + dx \\
& ]*\text{Log}[(c + dx)^(-n)]/((b^2c - a^2d)^5g^4i^2) - (4*bB^2d^3*\text{Log}[a + bx]* \\
& \text{Log}[(c + dx)^(-n)]^2)/((b^2c - a^2d)^5g^4i^2) + (4*bB^2d^3*\text{Log}[-((d*(a + \\
& bx))/(b^2c - a^2d))]*\text{Log}[(c + dx)^(-n)]^2)/((b^2c - a^2d)^5g^4i^2) + (8*bB \\
& ^2d^3n*\text{Log}[-((d*(a + bx))/(b^2c - a^2d))]*\text{Log}[c + dx]*(\text{Log}[(a + bx)^n] \\
& - \text{Log}[e*((a + bx)/(c + dx))^n] + \text{Log}[(c + dx)^(-n)]))/((b^2c - a^2d)^5g^4 \\
& *i^2) - (8A*bB^2d^3n*\text{PolyLog}[2, -((d*(a + bx))/(b^2c - a^2d))])/((b^2c - a^2 \\
& d)^5g^4i^2) - (20*bB^2d^3n^2*\text{PolyLog}[2, -((d*(a + bx))/(b^2c - a^2d))]) \\
& /((3*(b^2c - a^2d)^5g^4i^2) + (8*bB^2d^3n*\text{Log}[(a + bx)^n]*\text{PolyLog}[2, -(( \\
& d*(a + bx))/(b^2c - a^2d))])/((b^2c - a^2d)^5g^4i^2) - (8A*bB^2d^3n*\text{PolyLo \\
& g}[2, (b*(c + dx))/(b^2c - a^2d)]/((b^2c - a^2d)^5g^4i^2) - (20*bB^2d^3n^ \\
& 2*\text{PolyLog}[2, (b*(c + dx))/(b^2c - a^2d)]/((3*(b^2c - a^2d)^5g^4i^2) - (8*bB \\
& ^2d^3n*\text{Log}[(c + dx)^(-n)]*\text{PolyLog}[2, (b*(c + dx))/(b^2c - a^2d)]/((b^2c -
\end{aligned}$$

$$a*d)^5*g^4*i^2) + (8*b*B^2*d^3*n*(\text{Log}[(a + b*x)^n] - \text{Log}[e*((a + b*x)/(c + d*x))^n] + \text{Log}[(c + d*x)^{-n}])*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^5*g^4*i^2) - (8*b*B^2*d^3*n*\text{Log}[e*((a + b*x)/(c + d*x))^n]*\text{PolyLog}[2, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^5*g^4*i^2) - (8*b*B^2*d^3*n^2*\text{PolyLog}[3, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^5*g^4*i^2) - (8*b*B^2*d^3*n^2*\text{PolyLog}[3, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^5*g^4*i^2) - (8*b*B^2*d^3*n^2*\text{PolyLog}[3, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^5*g^4*i^2)$$

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*RFX^p])^n, RGx, x] }, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFX, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[ ((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[ ((d + e*x)^(m + 1)*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFX_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFX^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFX^p])^(n - 1)*D[RFX, x])/RFX, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFX, x] && IGtQ[n, 0]
```



Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol]
:> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

### Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] := Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

### Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
x_Symbol] := Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

### Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] := Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

### Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] := With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
h*x)^t]^u)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s + 1))/(p*r*(s + 1)*(b*c
- a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q]^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
EqQ[p + q, 0] && NeQ[s, -1]
```

### Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] := -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q]^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
```

$[b*g - a*h, 0] \&\& \text{IGtQ}[s, 0]$

### Rule 2506

$\text{Int}[\text{Log}[v\_]*\text{Log}[(e\_)*((f\_)*((a\_)+(b\_)*(x\_))^{\text{p}\_}*((c\_)+(d\_)*(x\_))^{\text{q}\_})^{\text{r}\_}]^{\text{s}\_}*(u\_), x\_Symbol] \text{ :> With}[\{g = \text{Simplify}[(v - 1)*(c + d*x)]/(a + b*x), h = \text{Simplify}[u*(a + b*x)*(c + d*x)]\}, -\text{Simp}[(h*\text{PolyLog}[2, 1 - v]*\text{Log}[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/(b*c - a*d), x] + \text{Dist}[h*p*r*s, \text{Int}[(\text{PolyLog}[2, 1 - v]*\text{Log}[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^{\text{s} - 1})/((a + b*x)*(c + d*x)), x], x] /; \text{FreeQ}[\{g, h\}, x] /; \text{FreeQ}\{a, b, c, d, e, f, p, q, r, s\}, x] \&\& \text{NeQ}[b*c - a*d, 0] \&\& \text{IGtQ}[s, 0] \&\& \text{EqQ}[p + q, 0]$

### Rule 6610

$\text{Int}[(u\_)*\text{PolyLog}[n\_ , v\_], x\_Symbol] \text{ :> With}[\{w = \text{DerivativeDivides}[v, u*v, x]\}, \text{Simp}[w*\text{PolyLog}[n + 1, v], x] /; \text{!FalseQ}[w] /; \text{FreeQ}[n, x]$

### Rule 2500

$\text{Int}[(\text{Log}[(e\_)*((f\_)*((a\_)+(b\_)*(x\_))^{\text{p}\_}*((c\_)+(d\_)*(x\_))^{\text{q}\_})^{\text{r}\_})*((s\_)+\text{Log}[(i\_)*((g\_)+(h\_)*(x\_))^{\text{n}\_}]*(\text{t}\_)))/((j\_)+(k\_)*(x\_)), x\_Symbol] \text{ :> Dist}[\text{Log}[e*(f*(a + b*x)^p*(c + d*x)^q]^r] - \text{Log}[(a + b*x)^{p*r}] - \text{Log}[(c + d*x)^{q*r}], \text{Int}[(s + t*\text{Log}[i*(g + h*x)^n])/(j + k*x), x], x] + (\text{Int}[(\text{Log}[(a + b*x)^{p*r}]*(\text{s} + t*\text{Log}[i*(g + h*x)^n]))/(j + k*x), x] + \text{Int}[(\text{Log}[(c + d*x)^{q*r}]*(\text{s} + t*\text{Log}[i*(g + h*x)^n]))/(j + k*x), x]) /; \text{FreeQ}\{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r\}, x] \&\& \text{NeQ}[b*c - a*d, 0]$

### Rule 2433

$\text{Int}[(a\_)+\text{Log}[(c\_)*((d\_)+(e\_)*(x\_))^{\text{n}\_}]*(\text{b}\_)]^{\text{p}\_}*((f\_)+\text{Log}[(h\_)*((i\_)+(j\_)*(x\_))^{\text{m}\_}]*(\text{g}\_))*((k\_)+(l\_)*(x\_))^{\text{r}\_}, x\_Symbol] \text{ :> Dist}[1/e, \text{Subst}[\text{Int}[(k*x)/d]^r*(a + b*\text{Log}[c*x^n])^p*(f + g*\text{Log}[h*(e*i - d*j)/e + (j*x)/e]^m)], x], x, d + e*x], x] /; \text{FreeQ}\{a, b, c, d, e, f, g, h, i, j, k, l, n, p, r\}, x] \&\& \text{EqQ}[e*k - d*1, 0]$

### Rule 2375

$\text{Int}[(\text{Log}[(d\_)*((e\_)+(f\_)*(x\_))^{\text{m}\_})^{\text{r}\_}]*((a\_)+\text{Log}[(c\_)*(x\_))^{\text{n}\_}]*(\text{b}\_)]^{\text{p}\_}/(x\_), x\_Symbol] \text{ :> Simp}[(\text{Log}[d*(e + f*x^m)^r]*(a + b*\text{Log}[c*x^n])^{\text{p} + 1})/(b*n*(\text{p} + 1)), x] - \text{Dist}[(f*m*r)/(b*n*(\text{p} + 1)), \text{Int}[(x^{\text{m} - 1}*(a + b*\text{Log}[c*x^n])^{\text{p} + 1})/(e + f*x^m), x], x] /; \text{FreeQ}\{a, b, c, d, e, f, r, m, n\}, x] \&\& \text{IGtQ}[p, 0] \&\& \text{NeQ}[d*e, 1]$

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.))/(x_), x_Symbol] := -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0] && EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_)^(p_.))]/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]*(b_.))*((f_.) + Log[(h_.)*((i_.) + (j_.)*(x_)^(m_.))]*(g_.))*((k_) + (l_.)*(x_)^(r_.)), x_Symbol] := Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*1)/1) + (e*x)/1)^n])*(f + g*Log[h*(-((j*k - i*1)/1) + (j*x)/1)^m]), x], x, k + l*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]*(b_.))*((f_.) + Log[(h_.)*((i_.) + (j_.)*(x_)^(m_.))]*(g_.)))/(x_), x_Symbol] := Simp[Log[x]*(a + b*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Log[x]*(a + b*Log[c*(d + e*x)^n])]/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x]*(f + g*Log[h*(i + j*x)^m])]/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_)^(p_.))*((c_.) + (d_.)*(x_)^(q_.))^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_)^(n_.))*(t_.))^(m_.)))/(j_.) + (k_.)*(x_)), x_Symbol] := Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r)/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dist[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]*(b_.))^(p_)/((f_.) + (g_.
```

```

)*(x_), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]

```

### Rule 2302

```

Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^p]/(x_), x_Symbol] := Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
x]

```

### Rule 30

```

Int[(x_)^(m_.), x_Symbol] := Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]

```

### Rubi steps

$$\int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(201c + 201dx)^2(ag + bgx)^4} dx = -\frac{2bB^2n^2}{1090827(bc - ad)^2g^4(a + bx)^3} + \frac{7bB^2dn^2}{363609(bc - ad)^3g^4(a + bx)^2} - \frac{92bB^2a}{363609(bc - ad)^4g^4(a + bx)}$$

**Mathematica [B]** time = 3.06998, size = 1695, normalized size = 2.33

result too large to display

Antiderivative was successfully verified.

```

[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^4*(c*i +
d*i*x)^2), x]

```

```

[Out] -(36*b*B^2*d^3*n^2*(a + b*x)^3*(c + d*x)*Log[(a + b*x)/(c + d*x)]^3 + 9*B*n
*Log[(a + b*x)/(c + d*x)]^2*(12*a^3*A*b*c*d^3 + b^4*B*c^4*n - 6*a*b^3*B*c^3
*d*n + 18*a^2*b^2*B*c^2*d^2*n - 3*a^4*B*d^4*n + 36*a^2*A*b^2*c*d^3*x + 12*a
^3*A*b*d^4*x - 2*b^4*B*c^3*d*n*x + 18*a*b^3*B*c^2*d^2*n*x + 36*a^2*b^2*B*c
d^3*n*x - 12*a^3*b*B*d^4*n*x + 36*a*A*b^3*c*d^3*x^2 + 36*a^2*A*b^2*d^4*x^2
+ 6*b^4*B*c^2*d^2*n*x^2 + 54*a*b^3*B*c*d^3*n*x^2 + 12*A*b^4*c*d^3*x^3 + 36*
a*A*b^3*d^4*x^3 + 22*b^4*B*c*d^3*n*x^3 + 18*a*b^3*B*d^4*n*x^3 + 12*A*b^4*d^
4*x^4 + 10*b^4*B*d^4*n*x^4 + 12*b*B*d^3*(a + b*x)^3*(c + d*x)*Log[e*((a + b
*x)/(c + d*x))^n] - 12*b*B*d^3*n*(a + b*x)^3*(c + d*x)*Log[(a + b*x)/(c + d
*x)]) + 3*b*d^2*(b*c - a*d)*(a + b*x)^2*(c + d*x)*(27*A^2 + 78*A*B*n + 92*B

```

$$\begin{aligned}
& ^2n^2 + 27B^2\text{Log}[e*((a + b*x)/(c + d*x))^n]^2 - 6B*n*(9A + 13B*n)*\text{Log} \\
& [(a + b*x)/(c + d*x)] + 27B^2n^2\text{Log}[(a + b*x)/(c + d*x)]^2 + 6B*\text{Log}[e*( \\
& (a + b*x)/(c + d*x))^n]*(9A + 13B*n - 9B*n*\text{Log}[(a + b*x)/(c + d*x)]) + \\
& 6*b*d^3*(a + b*x)^3*(c + d*x)*\text{Log}[a + b*x]*(18A^2 + 30A*B*n + 55B^2n^2 \\
& + 18B^2*\text{Log}[e*((a + b*x)/(c + d*x))^n]^2 - 6B*n*(6A + 5B*n)*\text{Log}[(a + b* \\
& x)/(c + d*x)] + 18B^2n^2\text{Log}[(a + b*x)/(c + d*x)]^2 + 6B*\text{Log}[e*((a + b*x) \\
& )/(c + d*x))^n]*(6A + 5B*n - 6B*n*\text{Log}[(a + b*x)/(c + d*x)]) + b*(b*c - \\
& a*d)^3*(c + d*x)*(9A^2 + 6A*B*n + 2B^2n^2 + 9B^2*\text{Log}[e*((a + b*x)/(c + \\
& d*x))^n]^2 - 6B*n*(3A + B*n)*\text{Log}[(a + b*x)/(c + d*x)] + 9B^2n^2\text{Log}[(a \\
& + b*x)/(c + d*x)]^2 + 6B*\text{Log}[e*((a + b*x)/(c + d*x))^n]*(3A + B*n - 3B* \\
& n*\text{Log}[(a + b*x)/(c + d*x)]) - 3*b*d*(b*c - a*d)^2*(a + b*x)*(c + d*x)*(9A \\
& ^2 + 12A*B*n + 7B^2n^2 + 9B^2*\text{Log}[e*((a + b*x)/(c + d*x))^n]^2 - 6B*n* \\
& (3A + 2B*n)*\text{Log}[(a + b*x)/(c + d*x)] + 9B^2n^2\text{Log}[(a + b*x)/(c + d*x)] \\
& ^2 + 6B*\text{Log}[e*((a + b*x)/(c + d*x))^n]*(3A + 2B*n - 3B*n*\text{Log}[(a + b*x)/ \\
& (c + d*x)]) + 6B*(b*c - a*d)*n*\text{Log}[(a + b*x)/(c + d*x)]*(3*b*d^2*(a + b*x) \\
& )^2*(c + d*x)*(9A + 13B*n + 9B*\text{Log}[e*((a + b*x)/(c + d*x))^n] - 9B*n*\text{Lo} \\
& g[(a + b*x)/(c + d*x)] + b*(b*c - a*d)^2*(c + d*x)*(3A + B*n + 3B*\text{Log}[e* \\
& ((a + b*x)/(c + d*x))^n] - 3B*n*\text{Log}[(a + b*x)/(c + d*x)]) - 3*b*d*(b*c - a \\
& *d)*(a + b*x)*(c + d*x)*(3A + 2B*n + 3B*\text{Log}[e*((a + b*x)/(c + d*x))^n] - \\
& 3B*n*\text{Log}[(a + b*x)/(c + d*x)]) + 9*d^3*(a + b*x)^3*(A - B*n + B*\text{Log}[e*((a \\
& + b*x)/(c + d*x))^n] - B*n*\text{Log}[(a + b*x)/(c + d*x)]) + 27*d^3*(b*c - a*d) \\
& *(a + b*x)^3*(A^2 - 2A*B*n + 2B^2n^2 + B^2*\text{Log}[e*((a + b*x)/(c + d*x))^n] \\
& ]^2 + 2B*n*(-A + B*n)*\text{Log}[(a + b*x)/(c + d*x)] + B^2n^2\text{Log}[(a + b*x)/(c \\
& + d*x)]^2 - 2B*\text{Log}[e*((a + b*x)/(c + d*x))^n]*(-A + B*n + B*n*\text{Log}[(a + b*x) \\
& )/(c + d*x)]) - 6*b*d^3*(a + b*x)^3*(c + d*x)*(18A^2 + 30A*B*n + 55B^2* \\
& n^2 + 18B^2*\text{Log}[e*((a + b*x)/(c + d*x))^n]^2 - 6B*n*(6A + 5B*n)*\text{Log}[(a \\
& + b*x)/(c + d*x)] + 18B^2n^2\text{Log}[(a + b*x)/(c + d*x)]^2 + 6B*\text{Log}[e*((a + \\
& b*x)/(c + d*x))^n]*(6A + 5B*n - 6B*n*\text{Log}[(a + b*x)/(c + d*x)])*\text{Log}[c + \\
& d*x)]/(27*(b*c - a*d)^5*g^4*i^2*(a + b*x)^3*(c + d*x))
\end{aligned}$$


---

**Maple [F]** time = 0.7, size = 0, normalized size = 0.

$$\int \frac{1}{(bgx + ag)^4 (dix + ci)^2} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^4/(d\*i\*x+c\*i)^2,x)

[Out] int((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^4/(d\*i\*x+c\*i)^2,x)

**Maxima [B]** time = 4.05585, size = 8331, normalized size = 11.43

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x,
algorithm="maxima")
```

```
[Out] -1/3*B^2*((12*b^3*d^3*x^3 + b^3*c^3 - 5*a*b^2*c^2*d + 13*a^2*b*c*d^2 + 3*a^3*d^3 + 6*(b^3*c*d^2 + 5*a*b^2*d^3)*x^2 - 2*(b^3*c^2*d - 8*a*b^2*c*d^2 - 11*a^2*b*d^3)*x)/((b^7*c^4*d - 4*a*b^6*c^3*d^2 + 6*a^2*b^5*c^2*d^3 - 4*a^3*b^4*c*d^4 + a^4*b^3*d^5)*g^4*i^2*x^4 + (b^7*c^5 - a*b^6*c^4*d - 6*a^2*b^5*c^3*d^2 + 14*a^3*b^4*c^2*d^3 - 11*a^4*b^3*c*d^4 + 3*a^5*b^2*d^5)*g^4*i^2*x^3 + 3*(a*b^6*c^5 - 3*a^2*b^5*c^4*d + 2*a^3*b^4*c^3*d^2 + 2*a^4*b^3*c^2*d^3 - 3*a^5*b^2*c*d^4 + a^6*b*d^5)*g^4*i^2*x^2 + (3*a^2*b^5*c^5 - 11*a^3*b^4*c^4*d + 14*a^4*b^3*c^3*d^2 - 6*a^5*b^2*c^2*d^3 - a^6*b*c*d^4 + a^7*d^5)*g^4*i^2*x + (a^3*b^4*c^5 - 4*a^4*b^3*c^4*d + 6*a^5*b^2*c^3*d^2 - 4*a^6*b*c^2*d^3 + a^7*c*d^4)*g^4*i^2) + 12*b*d^3*log(b*x + a)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^4*i^2) - 12*b*d^3*log(d*x + c)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^4*i^2))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)^2 - 2/3*A*B*((12*b^3*d^3*x^3 + b^3*c^3 - 5*a*b^2*c^2*d + 13*a^2*b*c*d^2 + 3*a^3*d^3 + 6*(b^3*c*d^2 + 5*a*b^2*d^3)*x^2 - 2*(b^3*c^2*d - 8*a*b^2*c*d^2 - 11*a^2*b*d^3)*x)/((b^7*c^4*d - 4*a*b^6*c^3*d^2 + 6*a^2*b^5*c^2*d^3 - 4*a^3*b^4*c*d^4 + a^4*b^3*d^5)*g^4*i^2*x^4 + (b^7*c^5 - a*b^6*c^4*d - 6*a^2*b^5*c^3*d^2 + 14*a^3*b^4*c^2*d^3 - 11*a^4*b^3*c*d^4 + 3*a^5*b^2*d^5)*g^4*i^2*x^3 + 3*(a*b^6*c^5 - 3*a^2*b^5*c^4*d + 2*a^3*b^4*c^3*d^2 + 2*a^4*b^3*c^2*d^3 - 3*a^5*b^2*c*d^4 + a^6*b*d^5)*g^4*i^2*x^2 + (3*a^2*b^5*c^5 - 11*a^3*b^4*c^4*d + 14*a^4*b^3*c^3*d^2 - 6*a^5*b^2*c^2*d^3 - a^6*b*c*d^4 + a^7*d^5)*g^4*i^2*x + (a^3*b^4*c^5 - 4*a^4*b^3*c^4*d + 6*a^5*b^2*c^3*d^2 - 4*a^6*b*c^2*d^3 + a^7*c*d^4)*g^4*i^2) + 12*b*d^3*log(b*x + a)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^4*i^2) - 12*b*d^3*log(d*x + c)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^4*i^2))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) - 1/27*((2*b^4*c^4 - 27*a*b^3*c^3*d + 32*4*a^2*b^2*c^2*d^2 - 245*a^3*b*c*d^3 - 54*a^4*d^4 + 330*(b^4*c*d^3 - a*b^3*d^4)*x^3 + 36*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(b*x + a)^3 - 36*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*x)*log(d*x + c)^3 + 15*(17*b^4*c^2*d^2 + 32*a*b^3*c*d^3 - 49*a^2*b^2*d^4)*x^2 - 90*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 +
```

$$\begin{aligned}
& a^2 b^2 d^4 x^2 + (3a^2 b^2 c d^3 + a^3 b d^4) x \log(bx + a)^2 - 18(5 \\
& b^4 d^4 x^4 + 5a^3 b c d^3 + 5(b^4 c d^3 + 3a b^3 d^4) x^3 + 15(a b^3 c \\
& c d^3 + a^2 b^2 d^4) x^2 + 5(3a^2 b^2 c d^3 + a^3 b d^4) x - 6(b^4 d^4 x \\
& ^4 + a^3 b c d^3 + (b^4 c d^3 + 3a b^3 d^4) x^3 + 3(a b^3 c d^3 + a^2 b^2 \\
& d^4) x^2 + (3a^2 b^2 c d^3 + a^3 b d^4) x) \log(bx + a) \log(dx + c)^2 - \\
& (19b^4 c^3 d - 567a b^3 c^2 d^2 + 87a^2 b^2 c d^3 + 461a^3 b d^4) x + \\
& 330(b^4 d^4 x^4 + a^3 b c d^3 + (b^4 c d^3 + 3a b^3 d^4) x^3 + 3(a b^3 c \\
& d^3 + a^2 b^2 d^4) x^2 + (3a^2 b^2 c d^3 + a^3 b d^4) x) \log(bx + a) - 6 \\
& (55b^4 d^4 x^4 + 55a^3 b c d^3 + 55(b^4 c d^3 + 3a b^3 d^4) x^3 + 165 \\
& (a b^3 c d^3 + a^2 b^2 d^4) x^2 + 18(b^4 d^4 x^4 + a^3 b c d^3 + (b^4 c d^3 \\
& + 3a b^3 d^4) x^3 + 3(a b^3 c d^3 + a^2 b^2 d^4) x^2 + (3a^2 b^2 c d^3 \\
& + a^3 b d^4) x) \log(bx + a)^2 + 55(3a^2 b^2 c d^3 + a^3 b d^4) x - 30( \\
& b^4 d^4 x^4 + a^3 b c d^3 + (b^4 c d^3 + 3a b^3 d^4) x^3 + 3(a b^3 c d^3 \\
& + a^2 b^2 d^4) x^2 + (3a^2 b^2 c d^3 + a^3 b d^4) x) \log(bx + a) \log(dx \\
& + c)) n^2 / (a^3 b^5 c^6 g^4 i^2 - 5a^4 b^4 c^5 d g^4 i^2 + 10a^5 b^3 c^4 d^2 \\
& g^4 i^2 - 10a^6 b^2 c^3 d^3 g^4 i^2 + 5a^7 b c^2 d^4 g^4 i^2 - a^8 c d^5 g^4 i^2 \\
& + (b^8 c^5 d g^4 i^2 - 5a b^7 c^4 d^2 g^4 i^2 + 10a^2 b^6 c^3 d^3 g^4 i^2 - 10a^3 b^5 c^2 \\
& d^4 g^4 i^2 + 5a^4 b^4 c d^5 g^4 i^2 - a^5 b^3 d^6 g^4 i^2) x^4 + (b^8 c^6 g^4 i^2 - 2a b^7 c^5 d \\
& g^4 i^2 - 5a^2 b^6 c^4 d^2 g^4 i^2 + 20a^3 b^5 c^3 d^3 g^4 i^2 - 25a^4 b^4 c^2 d^4 g^4 i^2 + \\
& 14a^5 b^3 c d^5 g^4 i^2 - 3a^6 b^2 d^6 g^4 i^2) x^3 + 3(a b^7 c^6 g^4 i^2 - 4a^2 b^6 c^5 d \\
& g^4 i^2 + 5a^3 b^5 c^4 d^2 g^4 i^2 - 5a^5 b^3 c^2 d^4 g^4 i^2 + 4a^6 b^2 c d^5 g^4 i^2 - a^7 b \\
& d^6 g^4 i^2) x^2 + (3a^2 b^6 c^6 g^4 i^2 - 14a^3 b^5 c^5 d g^4 i^2 + 25a^4 b^4 c^4 d^2 g^4 i^2 - \\
& 20a^5 b^3 c^3 d^3 g^4 i^2 + 5a^6 b^2 c^2 d^4 g^4 i^2 + 2a^7 b c d^5 g^4 i^2 - a^8 d^6 g^4 i^2) \\
& x) + 6(b^4 c^4 - 9a b^3 c^3 d + 54a^2 b^2 c^2 d^2 - 55a^3 b c d^3 + 9a^4 d^4 + 30(b^4 c \\
& d^3 - a b^3 d^4) x^3 + 3(11b^4 c^2 d^2 + 8a b^3 c d^3 - 19a^2 b^2 d^4) x^2 - 18(b^4 d^4 x^4 \\
& + a^3 b c d^3 + (b^4 c d^3 + 3a b^3 d^4) x^3 + 3(a b^3 c d^3 + a^2 b^2 d^4) x^2 + (3a^2 b^2 \\
& c d^3 + a^3 b d^4) x) \log(bx + a)^2 - 18(b^4 d^4 x^4 + a^3 b c d^3 + (b^4 c d^3 + 3a \\
& b^3 d^4) x^3 + 3(a b^3 c d^3 + a^2 b^2 d^4) x^2 + (3a^2 b^2 c d^3 + a^3 b d^4) x) \log(dx \\
& + c)^2 - (5b^4 c^3 d - 81a b^3 c^2 d^2 + 57a^2 b^2 c d^3 + 19a^3 b d^4) x + 30(b^4 d^4 x^4 \\
& + a^3 b c d^3 + (b^4 c d^3 + 3a b^3 d^4) x^3 + 3(a b^3 c d^3 + a^2 b^2 d^4) x^2 + (3a^2 b^2 c \\
& d^3 + a^3 b d^4) x) \log(bx + a) - 6(5b^4 d^4 x^4 + 5a^3 b c d^3 + 5(b^4 c d^3 + 3a \\
& b^3 d^4) x^3 + 15(a b^3 c d^3 + a^2 b^2 d^4) x^2 + 5(3a^2 b^2 c d^3 + a^3 b d^4) x - 6(b^4 \\
& d^4 x^4 + a^3 b c d^3 + (b^4 c d^3 + 3a b^3 d^4) x^3 + 3(a b^3 c d^3 + a^2 b^2 d^4) x^2 + (3a^2 b^2 \\
& c d^3 + a^3 b d^4) x) \log(bx + a) \log(dx + c)) n \log(e(bx/(dx + c) + a/(dx + c)) \\
& ^n) / (a^3 b^5 c^6 g^4 i^2 - 5a^4 b^4 c^5 d g^4 i^2 + 10a^5 b^3 c^4 d^2 g^4 i^2 - 10a^6 b^2 c^3 d^3 \\
& g^4 i^2 + 5a^7 b c^2 d^4 g^4 i^2 - a^8 c d^5 g^4 i^2 + (b^8 c^5 d g^4 i^2 - 5a b^7 c^4 d^2 g^4 i^2 + 10a^2 b^6 c^3 \\
& d^3 g^4 i^2 - 10a^3 b^5 c^2 d^4 g^4 i^2 + 5a^4 b^4 c d^5 g^4 i^2 - a^5 b^3 d^6 g^4 i^2) x^4 + (b^8 c^6 g^4 i^2 - 2a \\
& b^7 c^5 d g^4 i^2 - 5a^2 b^6 c^4 d^2 g^4 i^2 + 20a^3 b^5 c^3 d^3 g^4 i^2 - 25a^4 b^4 c^2 d^4 g^4 i^2 + 14a^5
\end{aligned}$$



$$\begin{aligned}
& *b^3*c*d^5*g^4*i^2 - 3*a^6*b^2*d^6*g^4*i^2)*x^3 + 3*(a*b^7*c^6*g^4*i^2 - 4* \\
& a^2*b^6*c^5*d*g^4*i^2 + 5*a^3*b^5*c^4*d^2*g^4*i^2 - 5*a^5*b^3*c^2*d^4*g^4*i \\
& ^2 + 4*a^6*b^2*c*d^5*g^4*i^2 - a^7*b*d^6*g^4*i^2)*x^2 + (3*a^2*b^6*c^6*g^4* \\
& i^2 - 14*a^3*b^5*c^5*d*g^4*i^2 + 25*a^4*b^4*c^4*d^2*g^4*i^2 - 20*a^5*b^3*c^ \\
& 3*d^3*g^4*i^2 + 5*a^6*b^2*c^2*d^4*g^4*i^2 + 2*a^7*b*c*d^5*g^4*i^2 - a^8*d^6 \\
& *g^4*i^2)*x)) * B^2 - 2/9*(b^4*c^4 - 9*a*b^3*c^3*d + 54*a^2*b^2*c^2*d^2 - 55* \\
& a^3*b*c*d^3 + 9*a^4*d^4 + 30*(b^4*c*d^3 - a*b^3*d^4)*x^3 + 3*(11*b^4*c^2*d^ \\
& 2 + 8*a*b^3*c*d^3 - 19*a^2*b^2*d^4)*x^2 - 18*(b^4*d^4*x^4 + a^3*b*c*d^3 + ( \\
& b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b \\
& ^2*c*d^3 + a^3*b*d^4)*x)*log(b*x + a)^2 - 18*(b^4*d^4*x^4 + a^3*b*c*d^3 + ( \\
& b^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b \\
& ^2*c*d^3 + a^3*b*d^4)*x)*log(d*x + c)^2 - (5*b^4*c^3*d - 81*a*b^3*c^2*d^2 + \\
& 57*a^2*b^2*c*d^3 + 19*a^3*b*d^4)*x + 30*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4* \\
& c*d^3 + 3*a*b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c \\
& *d^3 + a^3*b*d^4)*x)*log(b*x + a) - 6*(5*b^4*d^4*x^4 + 5*a^3*b*c*d^3 + 5*(b \\
& ^4*c*d^3 + 3*a*b^3*d^4)*x^3 + 15*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 5*(3*a^2 \\
& *b^2*c*d^3 + a^3*b*d^4)*x - 6*(b^4*d^4*x^4 + a^3*b*c*d^3 + (b^4*c*d^3 + 3*a \\
& *b^3*d^4)*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + (3*a^2*b^2*c*d^3 + a^3* \\
& b*d^4)*x)*log(b*x + a)*log(d*x + c))*A*B^n/(a^3*b^5*c^6*g^4*i^2 - 5*a^4*b^ \\
& 4*c^5*d*g^4*i^2 + 10*a^5*b^3*c^4*d^2*g^4*i^2 - 10*a^6*b^2*c^3*d^3*g^4*i^2 + \\
& 5*a^7*b*c^2*d^4*g^4*i^2 - a^8*c*d^5*g^4*i^2 + (b^8*c^5*d*g^4*i^2 - 5*a*b^7 \\
& *c^4*d^2*g^4*i^2 + 10*a^2*b^6*c^3*d^3*g^4*i^2 - 10*a^3*b^5*c^2*d^4*g^4*i^2 \\
& + 5*a^4*b^4*c*d^5*g^4*i^2 - a^5*b^3*d^6*g^4*i^2)*x^4 + (b^8*c^6*g^4*i^2 - 2 \\
& *a*b^7*c^5*d*g^4*i^2 - 5*a^2*b^6*c^4*d^2*g^4*i^2 + 20*a^3*b^5*c^3*d^3*g^4*i \\
& ^2 - 25*a^4*b^4*c^2*d^4*g^4*i^2 + 14*a^5*b^3*c*d^5*g^4*i^2 - 3*a^6*b^2*d^6* \\
& g^4*i^2)*x^3 + 3*(a*b^7*c^6*g^4*i^2 - 4*a^2*b^6*c^5*d*g^4*i^2 + 5*a^3*b^5*c^ \\
& ^4*d^2*g^4*i^2 - 5*a^5*b^3*c^2*d^4*g^4*i^2 + 4*a^6*b^2*c*d^5*g^4*i^2 - a^7* \\
& b*d^6*g^4*i^2)*x^2 + (3*a^2*b^6*c^6*g^4*i^2 - 14*a^3*b^5*c^5*d*g^4*i^2 + 25 \\
& *a^4*b^4*c^4*d^2*g^4*i^2 - 20*a^5*b^3*c^3*d^3*g^4*i^2 + 5*a^6*b^2*c^2*d^4*g \\
& ^4*i^2 + 2*a^7*b*c*d^5*g^4*i^2 - a^8*d^6*g^4*i^2)*x) - 1/3*A^2*((12*b^3*d^3 \\
& *x^3 + b^3*c^3 - 5*a*b^2*c^2*d + 13*a^2*b*c*d^2 + 3*a^3*d^3 + 6*(b^3*c*d^2 \\
& + 5*a*b^2*d^3)*x^2 - 2*(b^3*c^2*d - 8*a*b^2*c*d^2 - 11*a^2*b*d^3)*x)/((b^7* \\
& c^4*d - 4*a*b^6*c^3*d^2 + 6*a^2*b^5*c^2*d^3 - 4*a^3*b^4*c*d^4 + a^4*b^3*d^5 \\
& )*g^4*i^2*x^4 + (b^7*c^5 - a*b^6*c^4*d - 6*a^2*b^5*c^3*d^2 + 14*a^3*b^4*c^2 \\
& *d^3 - 11*a^4*b^3*c*d^4 + 3*a^5*b^2*d^5)*g^4*i^2*x^3 + 3*(a*b^6*c^5 - 3*a^2 \\
& *b^5*c^4*d + 2*a^3*b^4*c^3*d^2 + 2*a^4*b^3*c^2*d^3 - 3*a^5*b^2*c*d^4 + a^6* \\
& b*d^5)*g^4*i^2*x^2 + (3*a^2*b^5*c^5 - 11*a^3*b^4*c^4*d + 14*a^4*b^3*c^3*d^2 \\
& - 6*a^5*b^2*c^2*d^3 - a^6*b*c*d^4 + a^7*d^5)*g^4*i^2*x + (a^3*b^4*c^5 - 4* \\
& a^4*b^3*c^4*d + 6*a^5*b^2*c^3*d^2 - 4*a^6*b*c^2*d^3 + a^7*c*d^4)*g^4*i^2) + \\
& 12*b*d^3*log(b*x + a)/((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10* \\
& a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - a^5*d^5)*g^4*i^2) - 12*b*d^3*log(d*x + c) \\
& /((b^5*c^5 - 5*a*b^4*c^4*d + 10*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^ \\
& 4*b*c*d^4 - a^5*d^5)*g^4*i^2))
\end{aligned}$$

**Fricas [B]** time = 0.830073, size = 6518, normalized size = 8.94

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x,
algorithm="fricas")
```

```
[Out] -1/27*(9*A^2*b^4*c^4 - 54*A^2*a*b^3*c^3*d + 162*A^2*a^2*b^2*c^2*d^2 - 90*A^
2*a^3*b*c*d^3 - 27*A^2*a^4*d^4 + 6*(18*A^2*b^4*c*d^3 - 18*A^2*a*b^3*d^4 + 5
5*(B^2*b^4*c*d^3 - B^2*a*b^3*d^4)*n^2 + 30*(A*B*b^4*c*d^3 - A*B*a*b^3*d^4)*
n)*x^3 + 36*(B^2*b^4*d^4*n^2*x^4 + B^2*a^3*b*c*d^3*n^2 + (B^2*b^4*c*d^3 + 3
*B^2*a*b^3*d^4)*n^2*x^3 + 3*(B^2*a*b^3*c*d^3 + B^2*a^2*b^2*d^4)*n^2*x^2 + (
3*B^2*a^2*b^2*c*d^3 + B^2*a^3*b*d^4)*n^2*x)*log((b*x + a)/(d*x + c))^3 + (2
*B^2*b^4*c^4 - 27*B^2*a*b^3*c^3*d + 324*B^2*a^2*b^2*c^2*d^2 - 245*B^2*a^3*b
*c*d^3 - 54*B^2*a^4*d^4)*n^2 + 3*(18*A^2*b^4*c^2*d^2 + 72*A^2*a*b^3*c*d^3 -
90*A^2*a^2*b^2*d^4 + 5*(17*B^2*b^4*c^2*d^2 + 32*B^2*a*b^3*c*d^3 - 49*B^2*a
^2*b^2*d^4)*n^2 + 6*(11*A*B*b^4*c^2*d^2 + 8*A*B*a*b^3*c*d^3 - 19*A*B*a^2*b^
2*d^4)*n)*x^2 + 9*(B^2*b^4*c^4 - 6*B^2*a*b^3*c^3*d + 18*B^2*a^2*b^2*c^2*d^2
- 10*B^2*a^3*b*c*d^3 - 3*B^2*a^4*d^4 + 12*(B^2*b^4*c*d^3 - B^2*a*b^3*d^4)*
x^3 + 6*(B^2*b^4*c^2*d^2 + 4*B^2*a*b^3*c*d^3 - 5*B^2*a^2*b^2*d^4)*x^2 - 2*(
B^2*b^4*c^3*d - 9*B^2*a*b^3*c^2*d^2 - 3*B^2*a^2*b^2*c*d^3 + 11*B^2*a^3*b*d^
4)*x + 12*(B^2*b^4*d^4*x^4 + B^2*a^3*b*c*d^3 + (B^2*b^4*c*d^3 + 3*B^2*a*b^3
*d^4)*x^3 + 3*(B^2*a*b^3*c*d^3 + B^2*a^2*b^2*d^4)*x^2 + (3*B^2*a^2*b^2*c*d^
3 + B^2*a^3*b*d^4)*x)*log((b*x + a)/(d*x + c))*log(e)^2 + 9*(12*A*B*a^3*b*
c*d^3*n + 2*(5*B^2*b^4*d^4*n^2 + 6*A*B*b^4*d^4*n)*x^4 + 2*((11*B^2*b^4*c*d^
3 + 9*B^2*a*b^3*d^4)*n^2 + 6*(A*B*b^4*c*d^3 + 3*A*B*a*b^3*d^4)*n)*x^3 + (B^
2*b^4*c^4 - 6*B^2*a*b^3*c^3*d + 18*B^2*a^2*b^2*c^2*d^2 - 3*B^2*a^4*d^4)*n^2
+ 6*((B^2*b^4*c^2*d^2 + 9*B^2*a*b^3*c*d^3)*n^2 + 6*(A*B*a*b^3*c*d^3 + A*B*
a^2*b^2*d^4)*n)*x^2 - 2*((B^2*b^4*c^3*d - 9*B^2*a*b^3*c^2*d^2 - 18*B^2*a^2*
b^2*c*d^3 + 6*B^2*a^3*b*d^4)*n^2 - 6*(3*A*B*a^2*b^2*c*d^3 + A*B*a^3*b*d^4)*
n)*x)*log((b*x + a)/(d*x + c))^2 + 6*(A*B*b^4*c^4 - 9*A*B*a*b^3*c^3*d + 54*
A*B*a^2*b^2*c^2*d^2 - 55*A*B*a^3*b*c*d^3 + 9*A*B*a^4*d^4)*n - (18*A^2*b^4*c
^3*d - 162*A^2*a*b^3*c^2*d^2 - 54*A^2*a^2*b^2*c*d^3 + 198*A^2*a^3*b*d^4 + (
19*B^2*b^4*c^3*d - 567*B^2*a*b^3*c^2*d^2 + 87*B^2*a^2*b^2*c*d^3 + 461*B^2*a
^3*b*d^4)*n^2 + 6*(5*A*B*b^4*c^3*d - 81*A*B*a*b^3*c^2*d^2 + 57*A*B*a^2*b^2*
c*d^3 + 19*A*B*a^3*b*d^4)*n)*x + 6*(3*A*B*b^4*c^4 - 18*A*B*a*b^3*c^3*d + 54
*A*B*a^2*b^2*c^2*d^2 - 30*A*B*a^3*b*c*d^3 - 9*A*B*a^4*d^4 + 6*(6*A*B*b^4*c*
d^3 - 6*A*B*a*b^3*d^4 + 5*(B^2*b^4*c*d^3 - B^2*a*b^3*d^4)*n)*x^3 + 3*(6*A*B
*b^4*c^2*d^2 + 24*A*B*a*b^3*c*d^3 - 30*A*B*a^2*b^2*d^4 + (11*B^2*b^4*c^2*d^
2 + 8*B^2*a*b^3*c*d^3 - 19*B^2*a^2*b^2*d^4)*n)*x^2 + 18*(B^2*b^4*d^4*n*x^4
+ B^2*a^3*b*c*d^3*n + (B^2*b^4*c*d^3 + 3*B^2*a*b^3*d^4)*n*x^3 + 3*(B^2*a*b^
```

$$\begin{aligned}
& 3*c*d^3 + B^2*a^2*b^2*d^4)*n*x^2 + (3*B^2*a^2*b^2*c*d^3 + B^2*a^3*b*d^4)*n* \\
& x)*\log((b*x + a)/(d*x + c))^2 + (B^2*b^4*c^4 - 9*B^2*a*b^3*c^3*d + 54*B^2*a \\
& ^2*b^2*c^2*d^2 - 55*B^2*a^3*b*c*d^3 + 9*B^2*a^4*d^4)*n - (6*A*B*b^4*c^3*d - \\
& 54*A*B*a*b^3*c^2*d^2 - 18*A*B*a^2*b^2*c*d^3 + 66*A*B*a^3*b*d^4 + (5*B^2*b^4 \\
& *c^3*d - 81*B^2*a*b^3*c^2*d^2 + 57*B^2*a^2*b^2*c*d^3 + 19*B^2*a^3*b*d^4)*n \\
& )*x + 3*(12*A*B*a^3*b*c*d^3 + 2*(5*B^2*b^4*d^4*n + 6*A*B*b^4*d^4)*x^4 + 2*( \\
& 6*A*B*b^4*c*d^3 + 18*A*B*a*b^3*d^4 + (11*B^2*b^4*c*d^3 + 9*B^2*a*b^3*d^4)*n \\
& )*x^3 + 6*(6*A*B*a*b^3*c*d^3 + 6*A*B*a^2*b^2*d^4 + (B^2*b^4*c^2*d^2 + 9*B^2 \\
& *a*b^3*c*d^3)*n)*x^2 + (B^2*b^4*c^4 - 6*B^2*a*b^3*c^3*d + 18*B^2*a^2*b^2*c^ \\
& ^2*d^2 - 3*B^2*a^4*d^4)*n + 2*(18*A*B*a^2*b^2*c*d^3 + 6*A*B*a^3*b*d^4 - (B^2 \\
& *b^4*c^3*d - 9*B^2*a*b^3*c^2*d^2 - 18*B^2*a^2*b^2*c*d^3 + 6*B^2*a^3*b*d^4)* \\
& n)*x)*\log((b*x + a)/(d*x + c))*\log(e) + 6*(18*A^2*a^3*b*c*d^3 + (55*B^2*b^4 \\
& *d^4*n^2 + 30*A*B*b^4*d^4*n + 18*A^2*b^4*d^4)*x^4 + (18*A^2*b^4*c*d^3 + 54 \\
& *A^2*a*b^3*d^4 + 5*(17*B^2*b^4*c*d^3 + 27*B^2*a*b^3*d^4)*n^2 + 6*(11*A*B*b^4 \\
& *c*d^3 + 9*A*B*a*b^3*d^4)*n)*x^3 + (B^2*b^4*c^4 - 9*B^2*a*b^3*c^3*d + 54*B \\
& ^2*a^2*b^2*c^2*d^2 + 9*B^2*a^4*d^4)*n^2 + 3*(18*A^2*a*b^3*c*d^3 + 18*A^2*a^ \\
& ^2*b^2*d^4 + (11*B^2*b^4*c^2*d^2 + 63*B^2*a*b^3*c*d^3 + 36*B^2*a^2*b^2*d^4)* \\
& n^2 + 6*(A*B*b^4*c^2*d^2 + 9*A*B*a*b^3*c*d^3)*n)*x^2 + 3*(A*B*b^4*c^4 - 6*A \\
& *B*a*b^3*c^3*d + 18*A*B*a^2*b^2*c^2*d^2 - 3*A*B*a^4*d^4)*n + (54*A^2*a^2*b^ \\
& ^2*c*d^3 + 18*A^2*a^3*b*d^4 - (5*B^2*b^4*c^3*d - 81*B^2*a*b^3*c^2*d^2 - 108* \\
& B^2*a^2*b^2*c*d^3 - 36*B^2*a^3*b*d^4)*n^2 - 6*(A*B*b^4*c^3*d - 9*A*B*a*b^3* \\
& c^2*d^2 - 18*A*B*a^2*b^2*c*d^3 + 6*A*B*a^3*b*d^4)*n)*x)*\log((b*x + a)/(d*x \\
& + c)))/((b^8*c^5*d - 5*a*b^7*c^4*d^2 + 10*a^2*b^6*c^3*d^3 - 10*a^3*b^5*c^2* \\
& d^4 + 5*a^4*b^4*c*d^5 - a^5*b^3*d^6)*g^4*i^2*x^4 + (b^8*c^6 - 2*a*b^7*c^5*d \\
& - 5*a^2*b^6*c^4*d^2 + 20*a^3*b^5*c^3*d^3 - 25*a^4*b^4*c^2*d^4 + 14*a^5*b^3 \\
& *c*d^5 - 3*a^6*b^2*d^6)*g^4*i^2*x^3 + 3*(a*b^7*c^6 - 4*a^2*b^6*c^5*d + 5*a^ \\
& 3*b^5*c^4*d^2 - 5*a^5*b^3*c^2*d^4 + 4*a^6*b^2*c*d^5 - a^7*b*d^6)*g^4*i^2*x^ \\
& 2 + (3*a^2*b^6*c^6 - 14*a^3*b^5*c^5*d + 25*a^4*b^4*c^4*d^2 - 20*a^5*b^3*c^3 \\
& *d^3 + 5*a^6*b^2*c^2*d^4 + 2*a^7*b*c*d^5 - a^8*d^6)*g^4*i^2*x + (a^3*b^5*c^ \\
& 6 - 5*a^4*b^4*c^5*d + 10*a^5*b^3*c^4*d^2 - 10*a^6*b^2*c^3*d^3 + 5*a^7*b*c^2 \\
& *d^4 - a^8*c*d^5)*g^4*i^2)
\end{aligned}$$


---

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n))\*\*2/(b\*g\*x+a\*g)\*\*4/(d\*i\*x+c\*i)\*\*2, x)

[Out] Timed out

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2}{(bgx + ag)^4 (dix + ci)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^2,x,  
algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/((b*g*x + a*g)^4*(d*i*x  
+ c*i)^2), x)
```

$$3.202 \quad \int \frac{(ag+bgx)^3 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ci+dix)^3} dx$$

**Optimal.** Leaf size=676

$$\frac{6b^2Bg^3n(bc-ad)\text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{d^4i^3} + \frac{2b^2B^2g^3n^2(bc-ad)\text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)}{d^4i^3} - \frac{6b^2B^2g^3n^2}{d^4i^3}$$

```
[Out] (B^2*(b*c - a*d)*g^3*n^2*(a + b*x)^2)/(4*d^2*i^3*(c + d*x)^2) - (4*A*b*B*(b*c - a*d)*g^3*n*(a + b*x))/(d^3*i^3*(c + d*x)) + (4*b*B^2*(b*c - a*d)*g^3*n^2*(a + b*x))/(d^3*i^3*(c + d*x)) - (4*b*B^2*(b*c - a*d)*g^3*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(d^3*i^3*(c + d*x)) - (B*(b*c - a*d)*g^3*n*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d^2*i^3*(c + d*x)^2) + (b^2*g^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(d^3*i^3) + (b*c - a*d)*g^3*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*d^2*i^3*(c + d*x)^2) + (2*b*(b*c - a*d)*g^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(d^3*i^3*(c + d*x)) + (2*b^2*B*(b*c - a*d)*g^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(d^4*i^3) + (3*b^2*(b*c - a*d)*g^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[(b*c - a*d)/(b*(c + d*x))])/(d^4*i^3) + (2*b^2*B^2*(b*c - a*d)*g^3*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i^3) + (6*b^2*B*(b*c - a*d)*g^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i^3) - (6*b^2*B^2*(b*c - a*d)*g^3*n^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/(d^4*i^3)
```

**Rubi [B]** time = 6.20093, antiderivative size = 2026, normalized size of antiderivative = 3., number of steps used = 117, number of rules used = 26, integrand size = 45,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.578$ , Rules used = {2528, 2523, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 2525, 44, 6688, 6742, 2500, 2433, 2375, 2317, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i + d*i*x)^3,x]
```

```
[Out] (B^2*(b*c - a*d)^3*g^3*n^2)/(4*d^4*i^3*(c + d*x)^2) - (9*b*B^2*(b*c - a*d)^2*g^3*n^2)/(2*d^4*i^3*(c + d*x)) - (9*b^2*B^2*(b*c - a*d)*g^3*n^2*Log[a + b
```

$$\begin{aligned}
& *x)]/(2*d^4*i^3) - (a*b^2*B^2*g^3*n^2*\text{Log}[a + b*x]^2)/(d^3*i^3) - (5*b^2*B^2*(b*c - a*d)*g^3*n^2*\text{Log}[a + b*x]^2)/(2*d^4*i^3) - (B*(b*c - a*d)^3*g^3*n^2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]))/(2*d^4*i^3*(c + d*x)^2) + (5*b*B*(b*c - a*d)^2*g^3*n^2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]))/(d^4*i^3*(c + d*x)) + (2*a*b^2*B*g^3*n^2*\text{Log}[a + b*x]*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]))/(d^3*i^3) + (5*b^2*B*(b*c - a*d)*g^3*n^2*\text{Log}[a + b*x]*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n]))/(d^4*i^3) + (b^3*g^3*x*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2)/(d^3*i^3) + ((b*c - a*d)^3*g^3*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2)/(2*d^4*i^3*(c + d*x)^2) - (3*b*(b*c - a*d)^2*g^3*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2)/(d^4*i^3*(c + d*x)) + (9*b^2*B^2*(b*c - a*d)*g^3*n^2*\text{Log}[c + d*x])/(2*d^4*i^3) + (6*A*b^2*B*(b*c - a*d)*g^3*n^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/(d^4*i^3) + (2*b^3*B^2*c*g^3*n^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/(d^4*i^3) + (5*b^2*B^2*(b*c - a*d)*g^3*n^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[c + d*x])/(d^4*i^3) + (3*b^2*B^2*(b*c - a*d)*g^3*\text{Log}[(a + b*x)^n]^2*\text{Log}[c + d*x])/(d^4*i^3) - (2*b^3*B*c*g^3*n^2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])*\text{Log}[c + d*x])/(d^4*i^3) - (5*b^2*B*(b*c - a*d)*g^3*n^2*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])*\text{Log}[c + d*x])/(d^4*i^3) - (3*b^2*(b*c - a*d)*g^3*(A + B*\text{Log}[e*((a + b*x)/(c + d*x))^n])^2*\text{Log}[c + d*x])/(d^4*i^3) - (3*A*b^2*B*(b*c - a*d)*g^3*n^2*\text{Log}[c + d*x]^2)/(d^4*i^3) - (b^3*B^2*c*g^3*n^2*\text{Log}[c + d*x]^2)/(d^4*i^3) - (5*b^2*B^2*(b*c - a*d)*g^3*n^2*\text{Log}[c + d*x]^2)/(2*d^4*i^3) + (3*b^2*B^2*(b*c - a*d)*g^3*n^2*\text{Log}[a + b*x]*\text{Log}[c + d*x]^2)/(d^4*i^3) - (3*b^2*B^2*(b*c - a*d)*g^3*n^2*\text{Log}[e*((a + b*x)/(c + d*x))^n]*\text{Log}[c + d*x]^2)/(d^4*i^3) - (b^2*B^2*(b*c - a*d)*g^3*n^2*\text{Log}[c + d*x]^3)/(d^4*i^3) + (2*a*b^2*B^2*g^3*n^2*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)])/(d^3*i^3) + (5*b^2*B^2*(b*c - a*d)*g^3*n^2*\text{Log}[a + b*x]*\text{Log}[(b*(c + d*x))/(b*c - a*d)])/(d^4*i^3) - (3*b^2*B^2*(b*c - a*d)*g^3*\text{Log}[(a + b*x)^n]^2*\text{Log}[(b*(c + d*x))/(b*c - a*d)])/(d^4*i^3) + (6*b^2*B^2*(b*c - a*d)*g^3*n^2*\text{Log}[a + b*x]*\text{Log}[c + d*x]*\text{Log}[(c + d*x)^(-n)])/(d^4*i^3) + (3*b^2*B^2*(b*c - a*d)*g^3*\text{Log}[a + b*x]*\text{Log}[(c + d*x)^(-n)]^2)/(d^4*i^3) - (3*b^2*B^2*(b*c - a*d)*g^3*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[(c + d*x)^(-n)]^2)/(d^4*i^3) - (6*b^2*B^2*(b*c - a*d)*g^3*n^2*\text{Log}[-((d*(a + b*x))/(b*c - a*d))]*\text{Log}[(c + d*x)^(-n)] + \text{Log}[(c + d*x)^(-n)])/(d^4*i^3) + (2*a*b^2*B^2*g^3*n^2*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))])/(d^3*i^3) + (5*b^2*B^2*(b*c - a*d)*g^3*n^2*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))])/(d^4*i^3) - (6*b^2*B^2*(b*c - a*d)*g^3*n^2*\text{Log}[(a + b*x)^n]*\text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))])/(d^4*i^3) + (6*A*b^2*B*(b*c - a*d)*g^3*n^2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])/(d^4*i^3) + (2*b^3*B^2*c*g^3*n^2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])/(d^4*i^3) + (5*b^2*B^2*(b*c - a*d)*g^3*n^2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])/(d^4*i^3) + (6*b^2*B^2*(b*c - a*d)*g^3*n^2*\text{Log}[(c + d*x)^(-n)]*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])/(d^4*i^3) - (6*b^2*B^2*(b*c - a*d)*g^3*n^2*(\text{Log}[(a + b*x)^n] - \text{Log}[e*((a + b*x)/(c + d*x))^n] + \text{Log}[(c + d*x)^(-n)])*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])/(d^4*i^3) + (6*b^2*B^2*(b*c - a*d)*g^3*n^2*\text{PolyLog}[3, -((d*(a + b*x))/(b*c - a*d))])/(d^4*i^3) + (6*b^2*B^2*(b*c - a*d)*g^3*n^2*\text{PolyLog}[3, (b*(c + d*x))/(b*c - a*d)])/(d^4*i^3)
\end{aligned}$$

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] := Simp[x*(a +
b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_)] /; FreeQ[b, x]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

Rule 6688

```
Int[u_, x_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifierIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]
```



Rule 2500

Int[(Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.) )^(r\_.)]\*((s\_.) + Log[(i\_.)\*((g\_.) + (h\_.)\*(x\_))^(n\_.)]\*(t\_.)))/((j\_.) + (k\_.)\*(x\_)), x\_Symbol] := Dist[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q)^r] - Log[(a + b\*x)^(p\*r)] - Log[(c + d\*x)^(q\*r)], Int[(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x], x] + (Int[(Log[(a + b\*x)^(p\*r)]\*(s + t\*Log[i\*(g + h\*x)^n]))/(j + k\*x), x] + Int[(Log[(c + d\*x)^(q\*r)]\*(s + t\*Log[i\*(g + h\*x)^n]))/(j + k\*x), x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0]

Rule 2433

Int[((a\_.) + Log[(c\_.)\*((d\_.) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_.) + Log [(h\_.)\*((i\_.) + (j\_.)\*(x\_))^(m\_.)]\*(g\_.))\*((k\_.) + (l\_.)\*(x\_))^(r\_.), x\_Symbol] := Dist[1/e, Subst[Int[((k\*x)/d)^r\*(a + b\*Log[c\*x^n])^p\*(f + g\*Log[h\*(e\*i - d\*j)/e + (j\*x)/e]^m)], x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e\*k - d\*l, 0]

Rule 2375

Int[(Log[(d\_.)\*((e\_) + (f\_.)\*(x\_)^(m\_.))^(r\_.)]\*((a\_.) + Log[(c\_.)\*(x\_)^(n\_.) ]\*(b\_.))^(p\_.))/(x\_), x\_Symbol] := Simp[(Log[d\*(e + f\*x^m)^r]\*(a + b\*Log[ c\*x^n])^(p + 1))/(b\*n\*(p + 1)), x] - Dist[(f\*m\*r)/(b\*n\*(p + 1)), Int[(x^(m - 1)\*(a + b\*Log[c\*x^n])^(p + 1))/(e + f\*x^m), x], x] /; FreeQ[{a, b, c, d, e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d\*e, 1]

Rule 2317

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/((d\_) + (e\_.)\*(x\_)), x\_Symbol] := Simp[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^p)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]

Rule 2374

Int[(Log[(d\_.)\*((e\_) + (f\_.)\*(x\_)^(m\_.))]\*((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.))/(x\_), x\_Symbol] := -Simp[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^p)/m, x] + Dist[(b\*n\*p)/m, Int[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0] && EqQ[d\*e, 1]

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_Symbol]
:> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d, e, n, p}, x]
&& EqQ[b*d, a*e]
```

### Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol]
:> Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, m, n}, x]
&& IntegerQ[r]
```

### Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol]
:> Simp[Log[x]*(a + b*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Log[x]
*(a + b*Log[c*(d + e*x)^n])]/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x]
*(f + g*Log[h*(i + j*x)^m])]/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, m, n}, x]
&& EqQ[e*i - d*j, 0]
```

### Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.)
]^(r_.))*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/(j_.)
+ (k_.)*(x_)), x_Symbol]
:> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r)/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dist[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x]
&& NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

### Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.)
*(x_)), x_Symbol]
:> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p}, x]
&& NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

### Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)/(x_), x_Symbol]
:> Dist[1/(b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
```

x]

Rule 30

`Int[(x_)^(m_.), x_Symbol] := Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && NeQ[m, -1]`

Rubi steps

$$\begin{aligned}
\int \frac{(ag + bgx)^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(202c + 202dx)^3} dx &= \int \left( \frac{b^3 g^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{8242408d^3} + \frac{(-bc + ad)^3 g^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{8242408d^3(c + dx)^3} \right) dx \\
&= \frac{(b^3 g^3) \int \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx}{8242408d^3} - \frac{(3b^2(bc - ad)g^3) \int \frac{\left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{c+dx}}{8242408d^3} \\
&= \frac{b^3 g^3 x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{8242408d^3} + \frac{(bc - ad)^3 g^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{16484816d^4(c + dx)^2} - \\
&= \frac{b^3 g^3 x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{8242408d^3} + \frac{(bc - ad)^3 g^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{16484816d^4(c + dx)^2} - \\
&= \frac{b^3 g^3 x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{8242408d^3} + \frac{(bc - ad)^3 g^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{16484816d^4(c + dx)^2} - \\
&= \frac{b^3 g^3 x \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{8242408d^3} + \frac{(bc - ad)^3 g^3 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{16484816d^4(c + dx)^2} - \\
&= -\frac{B(bc - ad)^3 g^3 n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{16484816d^4(c + dx)^2} + \frac{5bB(bc - ad)^2 g^3 n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{8242408d^4(c + dx)} \\
&= -\frac{B(bc - ad)^3 g^3 n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{16484816d^4(c + dx)^2} + \frac{5bB(bc - ad)^2 g^3 n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{8242408d^4(c + dx)} \\
&= -\frac{B(bc - ad)^3 g^3 n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{16484816d^4(c + dx)^2} + \frac{5bB(bc - ad)^2 g^3 n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{8242408d^4(c + dx)} \\
&= \frac{B^2(bc - ad)^3 g^3 n^2}{32969632d^4(c + dx)^2} - \frac{9bB^2(bc - ad)^2 g^3 n^2}{16484816d^4(c + dx)} - \frac{9b^2 B^2(bc - ad) g^3 n^2 \log(a + bx)}{16484816d^4} \\
&= \frac{B^2(bc - ad)^3 g^3 n^2}{32969632d^4(c + dx)^2} - \frac{9bB^2(bc - ad)^2 g^3 n^2}{16484816d^4(c + dx)} - \frac{9b^2 B^2(bc - ad) g^3 n^2 \log(a + bx)}{16484816d^4} \\
&= \frac{B^2(bc - ad)^3 g^3 n^2}{32969632d^4(c + dx)^2} - \frac{9bB^2(bc - ad)^2 g^3 n^2}{16484816d^4(c + dx)} - \frac{9b^2 B^2(bc - ad) g^3 n^2 \log(a + bx)}{16484816d^4}
\end{aligned}$$

**Mathematica [B]** time = 9.91975, size = 5730, normalized size = 8.48

Result too large to show

Antiderivative was successfully verified.

[In] Integrate[((a\*g + b\*g\*x)^3\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(c\*i + d\*i\*x)^3,x]

[Out] Result too large to show

**Maple [F]** time = 0.723, size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^3}{(dix + ci)^3} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i)^3,x)

[Out] int((b\*g\*x+a\*g)^3\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i)^3,x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^3\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i)^3,x, algorithm="maxima")

[Out]  $\frac{3}{2}A*B*a^2*b*g^3*n*((b*c^2 - 3*a*c*d + 2*(b*c*d - 2*a*d^2)*x)/((b*c*d^4 - a*d^5)*i^3*x^2 + 2*(b*c^2*d^3 - a*c*d^4)*i^3*x + (b*c^3*d^2 - a*c^2*d^3)*i^3) + 2*(b^2*c - 2*a*b*d)*\log(b*x + a)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*i^3) - 2*(b^2*c - 2*a*b*d)*\log(d*x + c)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*i^3) + 1/2*A*B*a^3*g^3*n*((2*b*d*x + 3*b*c - a*d)/((b*c*d^3 - a*d^4)*i^3*x^2 + 2*(b*c^2*d^2 - a*c*d^3)*i^3*x + (b*c^3*d - a*c^2*d^2)*i^3) + 2*b^2*\log(b*x + a)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3) - 2*b^2*\log(d*x +$

$$\begin{aligned} & c)/((b^2c^2d - 2abc^2d^2 + a^2d^3)i^3)) - 1/2A^2b^3g^3((6c^2dx \\ & x + 5c^3)/(d^6i^3x^2 + 2c^2d^5i^3x + c^2d^4i^3) - 2x/(d^3i^3) + 6 \\ & c \log(dx + c)/(d^4i^3)) + 3/2A^2ab^2g^3((4c^2dx + 3c^2)/(d^5i^3x \\ & ^2 + 2c^2d^4i^3x + c^2d^3i^3) + 2 \log(dx + c)/(d^3i^3)) - 3(2dx + \\ & c)A^2B^2b^3g^3 \log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(d^4i^3x^2 + 2c^2 \\ & d^3i^3x + c^2d^2i^3) - 3/2(2dx + c)A^2a^2b^3g^3/(d^4i^3x^2 + 2c \\ & *d^3i^3x + c^2d^2i^3) - A^2B^2a^3g^3 \log(e*(b*x/(d*x + c) + a/(d*x + c)) \\ & ^n)/(d^3i^3x^2 + 2c^2d^2i^3x + c^2d^2i^3) - 1/2A^2a^3g^3/(d^3i^3x^2 \\ & + 2c^2d^2i^3x + c^2d^2i^3) + 1/2(2B^2b^3d^3g^3x^3 + 4B^2b^3c^2d \\ & ^2g^3x^2 - 2(2b^3c^2d^2g^3 - 6a^2b^2c^2d^2g^3 + 3a^2b^2d^3g^3)B^2x \\ & x - (5b^3c^3g^3 - 9a^2b^2c^2d^2g^3 + 3a^2b^2c^2d^2g^3 + a^3d^3g^3)B^2 \\ & ^2 - 6((b^3c^2d^2g^3 - a^2b^2d^3g^3)B^2x^2 + 2(b^3c^2d^2g^3 - a^2b^2c^2 \\ & d^2g^3)B^2x + (b^3c^3g^3 - a^2b^2c^2d^2g^3)B^2) \log(dx + c)) \log(( \\ & dx + c)^n)^2/(d^6i^3x^2 + 2c^2d^5i^3x + c^2d^4i^3) - \text{integrate}(- (3B \\ & ^2a^2b^3d^3g^3x \log(e)^2 + B^2a^3d^3g^3 \log(e)^2 + (B^2b^3d^3g^3 \log(e)^2 \\ & + 2A^2B^2b^3d^3g^3 \log(e))x^3 + 3(B^2a^2b^2d^3g^3 \log(e)^2 + 2 \\ & *A^2B^2a^2b^2d^3g^3 \log(e))x^2 + (B^2b^3d^3g^3x^3 + 3B^2a^2b^2d^3g^3 \\ & *x^2 + 3B^2a^2b^2d^3g^3x + B^2a^3d^3g^3) \log((b*x + a)^n)^2 + 2(3B \\ & ^2a^2b^3d^3g^3x \log(e) + B^2a^3d^3g^3 \log(e) + (B^2b^3d^3g^3 \log(e) \\ & ) + A^2B^2b^3d^3g^3)x^3 + 3(B^2a^2b^2d^3g^3 \log(e) + A^2B^2a^2b^2d^3g^3) \\ & *x^2) \log((b*x + a)^n) + (2(2b^3c^2d^2g^3n - 6a^2b^2c^2d^2g^3n + 3(g^3n \\ & - g^3 \log(e))a^2b^2d^3)B^2x - 2(A^2B^2b^3d^3g^3 + (g^3n + g^3 \log \\ & (e))B^2b^3d^3)x^3 + (5b^3c^3g^3n - 9a^2b^2c^2d^2g^3n + 3a^2b^2c^2 \\ & d^2g^3n + (g^3n - 2g^3 \log(e))a^3d^3)B^2 - 2(3A^2B^2a^2b^2d^3g^3 + \\ & (2b^3c^2d^2g^3n + 3a^2b^2d^3g^3 \log(e))B^2)x^2 + 6((b^3c^2d^2g^3n \\ & - a^2b^2d^3g^3n)B^2x^2 + 2(b^3c^2d^2g^3n - a^2b^2c^2d^2g^3n)B^2x \\ & + (b^3c^3g^3n - a^2b^2c^2d^2g^3n)B^2) \log(dx + c) - 2(B^2b^3d^3g^3 \\ & ^3x^3 + 3B^2a^2b^2d^3g^3x^2 + 3B^2a^2b^2d^3g^3x + B^2a^3d^3g^3) \\ & * \log((b*x + a)^n) \log((d*x + c)^n))/(d^6i^3x^3 + 3c^2d^5i^3x^2 + 3c^2 \\ & *d^4i^3x + c^3d^3i^3), x) \end{aligned}$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{A^2b^3g^3x^3 + 3A^2ab^2g^3x^2 + 3A^2a^2bg^3x + A^2a^3g^3 + (B^2b^3g^3x^3 + 3B^2ab^2g^3x^2 + 3B^2a^2bg^3x + B^2a^3g^3) \log\left(e\left(\frac{b}{d}\right)\right)}{d^3i^3x^3 + 3cd^2i^3x^2 + 3c^2di^3x + c^3d^3i^3} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x,
algorithm="fricas")
```

```
[Out] integral((A^2*b^3*g^3*x^3 + 3*A^2*a*b^2*g^3*x^2 + 3*A^2*a^2*b*g^3*x + A^2*a^3*g^3 + (B^2*b^3*g^3*x^3 + 3*B^2*a*b^2*g^3*x^2 + 3*B^2*a^2*b*g^3*x + B^2*a^3*g^3)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*B*b^3*g^3*x^3 + 3*A*B*a*b^2*g^3*x^2 + 3*A*B*a^2*b*g^3*x + A*B*a^3*g^3)*log(e*((b*x + a)/(d*x + c))^n))/(d^3*i^3*x^3 + 3*c*d^2*i^3*x^2 + 3*c^2*d*i^3*x + c^3*i^3), x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*i*x+c*i)**3, x)
```

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^3 \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2}{(dix + ci)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3, x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(d*i*x + c*i)^3, x)
```

$$3.203 \quad \int \frac{(ag+bgx)^2 \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ci+dx)^3} dx$$

**Optimal.** Leaf size=441

$$\frac{2b^2Bg^2n \text{PolyLog} \left( 2, \frac{d(a+bx)}{b(c+dx)} \right) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{d^3i^3} + \frac{2b^2B^2g^2n^2 \text{PolyLog} \left( 3, \frac{d(a+bx)}{b(c+dx)} \right)}{d^3i^3} - \frac{b^2g^2 \log \left( \frac{bc-ad}{b(c+dx)} \right) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{d^3i^3}$$

```
[Out] -(B^2*g^2*n^2*(a + b*x)^2)/(4*d*i^3*(c + d*x)^2) + (2*A*b*B*g^2*n*(a + b*x)
)/(d^2*i^3*(c + d*x)) - (2*b*B^2*g^2*n^2*(a + b*x))/(d^2*i^3*(c + d*x)) + (
2*b*B^2*g^2*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n]/(d^2*i^3*(c + d*x))
+ (B*g^2*n*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d*i^3*(c
+ d*x)^2) - (g^2*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*
d*i^3*(c + d*x)^2) - (b*g^2*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
)^2)/(d^2*i^3*(c + d*x)) - (b^2*g^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^
2*Log[(b*c - a*d)/(b*(c + d*x))])/(d^3*i^3) - (2*b^2*B*g^2*n*(A + B*Log[e*(
a + b*x)/(c + d*x))^n]*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i^3)
+ (2*b^2*B^2*g^2*n^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/(d^3*i^3)
```

**Rubi [B]** time = 5.12309, antiderivative size = 1435, normalized size of antiderivative = 3.25, number of steps used = 97, number of rules used = 25, integrand size = 45,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.556$ , Rules used = {2528, 2525, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 44, 6688, 6742, 2500, 2433, 2375, 2317, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(c*i + d*i*x
)^3,x]
```

```
[Out] -(B^2*(b*c - a*d)^2*g^2*n^2)/(4*d^3*i^3*(c + d*x)^2) + (5*b*B^2*(b*c - a*d)
*g^2*n^2)/(2*d^3*i^3*(c + d*x)) + (5*b^2*B^2*g^2*n^2*Log[a + b*x])/(2*d^3*i
^3) + (3*b^2*B^2*g^2*n^2*Log[a + b*x]^2)/(2*d^3*i^3) + (B*(b*c - a*d)^2*g^2
*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d^3*i^3*(c + d*x)^2) - (3*b*B
*(b*c - a*d)*g^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(d^3*i^3*(c + d*
x)) - (3*b^2*B*g^2*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(
d^3*i^3) - ((b*c - a*d)^2*g^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*
d^3*i^3*(c + d*x)^2) + (2*b*(b*c - a*d)*g^2*(A + B*Log[e*((a + b*x)/(c + d
```



$$\begin{aligned} & x))^{n})^2)/(d^3i^3(c + dx)) - (5b^2B^2g^2n^2\text{Log}[c + dx])/(2d^3i^3) \\ & - (2Ab^2B^2g^2n\text{Log}[-((d(a + bx))/(bc - ad))]\text{Log}[c + dx])/(d^3i^3) \\ & - (3b^2B^2g^2n^2\text{Log}[-((d(a + bx))/(bc - ad))]\text{Log}[c + dx])/(d^3i^3) \\ & - (b^2B^2g^2\text{Log}[(a + bx)^n]^2\text{Log}[c + dx])/(d^3i^3) + (3b^2B^2g^2n(A + B\text{Log}[e((a + bx)/(c + dx))^n])\text{Log}[c + dx])/(d^3i^3) \\ & + (b^2g^2(A + B\text{Log}[e((a + bx)/(c + dx))^n])^2\text{Log}[c + dx])/(d^3i^3) + (Ab^2B^2g^2n\text{Log}[c + dx]^2)/(d^3i^3) \\ & + (3b^2B^2g^2n^2\text{Log}[c + dx]^2)/(2d^3i^3) - (b^2B^2g^2n^2\text{Log}[a + bx]\text{Log}[c + dx]^2)/(d^3i^3) \\ & + (b^2B^2g^2n\text{Log}[e((a + bx)/(c + dx))^n]\text{Log}[c + dx]^2)/(d^3i^3) + (b^2B^2g^2n^2\text{Log}[c + dx]^3)/(3d^3i^3) \\ & - (3b^2B^2g^2n^2\text{Log}[a + bx]\text{Log}[(b(c + dx))/(bc - ad)])/(d^3i^3) + (b^2B^2g^2\text{Log}[(a + bx)^n]^2\text{Log}[(b(c + dx))/(bc - ad)])/(d^3i^3) \\ & - (2b^2B^2g^2n\text{Log}[a + bx]\text{Log}[c + dx]\text{Log}[(c + dx)^{-n}])/(d^3i^3) - (b^2B^2g^2\text{Log}[a + bx]\text{Log}[(c + dx)^{-n}]^2)/(d^3i^3) \\ & + (b^2B^2g^2\text{Log}[-((d(a + bx))/(bc - ad))]\text{Log}[(c + dx)^{-n}]^2)/(d^3i^3) + (2b^2B^2g^2n\text{Log}[-((d(a + bx))/(bc - ad))]\text{Log}[c + dx](\text{Log}[(a + bx)^n] - \text{Log}[e((a + bx)/(c + dx))^n] + \text{Log}[(c + dx)^{-n}]))/d^3i^3 \\ & - (3b^2B^2g^2n^2\text{PolyLog}[2, -((d(a + bx))/(bc - ad))])/(d^3i^3) + (2b^2B^2g^2n\text{Log}[(a + bx)^n]\text{PolyLog}[2, -((d(a + bx))/(bc - ad))])/(d^3i^3) \\ & - (2Ab^2B^2g^2n\text{PolyLog}[2, (b(c + dx))/(bc - ad)])/(d^3i^3) - (3b^2B^2g^2n^2\text{PolyLog}[2, (b(c + dx))/(bc - ad)])/(d^3i^3) \\ & - (2b^2B^2g^2n\text{Log}[(c + dx)^{-n}]\text{PolyLog}[2, (b(c + dx))/(bc - ad)])/(d^3i^3) + (2b^2B^2g^2n(\text{Log}[(a + bx)^n] - \text{Log}[e((a + bx)/(c + dx))^n] + \text{Log}[(c + dx)^{-n}])\text{PolyLog}[2, (b(c + dx))/(bc - ad)])/(d^3i^3) \\ & - (2b^2B^2g^2n^2\text{PolyLog}[3, -((d(a + bx))/(bc - ad))])/(d^3i^3) - (2b^2B^2g^2n^2\text{PolyLog}[3, (b(c + dx))/(bc - ad)])/(d^3i^3) \end{aligned}$$
**Rule 2528**

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

**Rule 2525**

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

**Rule 12**

```
Int[(a_)*(u_), x_Symbol] :=> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Sy
mbol] :=> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :=> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :=> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

### Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :=> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

### Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :=> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

### Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))])*(b_.)/((f_.) + (g_.)*(x_)), x_
Symbol] :=> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

#### Rule 44

```
Int[((a_) + (b_.)*(x_)^(m_.))*((c_.) + (d_.)*(x_)^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

#### Rule 6688

```
Int[u_, x_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifierIntegrandQ[v, u, x]]
```

#### Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]
```

#### Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_)^(p_.))*((c_.) + (d_.)*(x_)^(q_.))^(r_.)]*(s_.) + Log[(i_.)*((g_.) + (h_.)*(x_)^(n_.))*((t_.))]/((j_.) + (k_.)*(x_)), x_Symbol] := Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a + b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x), x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ[b*c - a*d, 0]
```

#### Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]*(b_.))^(p_.)*((f_.) + Log[(h_.)*((i_.) + (j_.)*(x_)^(m_.))*((g_.))*((k_.) + (l_.)*(x_)^(r_.), x_Symbol] := Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(e*i - d*j)/e + (j*x)/e]^m)], x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

#### Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*(a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] := Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m - 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
```

$e, f, r, m, n\}, x] \&\& \text{IGtQ}[p, 0] \&\& \text{NeQ}[d*e, 1]$

### Rule 2317

$\text{Int}[(a_.) + \text{Log}[(c_.)*(x_)^(n_.)]*(b_.)]^(p_.)/((d_.) + (e_.)*(x_)), x\_Symbol] \rightarrow \text{Simp}[(\text{Log}[1 + (e*x)/d]*(a + b*\text{Log}[c*x^n])^p)/e, x] - \text{Dist}[(b*n*p)/e, \text{Int}[(\text{Log}[1 + (e*x)/d]*(a + b*\text{Log}[c*x^n])^(p - 1))/x, x], x] /; \text{FreeQ}[\{a, b, c, d, e, n\}, x] \&\& \text{IGtQ}[p, 0]$

### Rule 2374

$\text{Int}[(\text{Log}[(d_.)*((e_.) + (f_.)*(x_)^(m_.))])*(a_.) + \text{Log}[(c_.)*(x_)^(n_.)]*(b_.)]^(p_.)/(x_), x\_Symbol] \rightarrow -\text{Simp}[(\text{PolyLog}[2, -(d*f*x^m)]*(a + b*\text{Log}[c*x^n])^p)/m, x] + \text{Dist}[(b*n*p)/m, \text{Int}[(\text{PolyLog}[2, -(d*f*x^m)]*(a + b*\text{Log}[c*x^n])^(p - 1))/x, x], x] /; \text{FreeQ}[\{a, b, c, d, e, f, m, n\}, x] \&\& \text{IGtQ}[p, 0] \&\& \text{EqQ}[d*e, 1]$

### Rule 6589

$\text{Int}[\text{PolyLog}[n_, (c_.)*((a_.) + (b_.)*(x_)^(p_.))]/((d_.) + (e_.)*(x_)), x\_Symbol] \rightarrow \text{Simp}[\text{PolyLog}[n + 1, c*(a + b*x)^p]/(e*p), x] /; \text{FreeQ}[\{a, b, c, d, e, n, p\}, x] \&\& \text{EqQ}[b*d, a*e]$

### Rule 2440

$\text{Int}[(a_.) + \text{Log}[(c_.)*((d_.) + (e_.)*(x_)^(n_.))]*(b_.)]*((f_.) + \text{Log}[(h_.)*((i_.) + (j_.)*(x_)^(m_.))]*(g_.)]*((k_.) + (l_.)*(x_)^(r_.)), x\_Symbol] \rightarrow \text{Dist}[1/l, \text{Subst}[\text{Int}[x^r*(a + b*\text{Log}[c*(-((e*k - d*1)/1) + (e*x)/1)^n])*(f + g*\text{Log}[h*(-((j*k - i*1)/1) + (j*x)/1)^m]), x], x, k + l*x], x] /; \text{FreeQ}[\{a, b, c, d, e, f, g, h, i, j, k, l, m, n\}, x] \&\& \text{IntegerQ}[r]$

### Rule 2434

$\text{Int}[(a_.) + \text{Log}[(c_.)*((d_.) + (e_.)*(x_)^(n_.))]*(b_.)]*((f_.) + \text{Log}[(h_.)*((i_.) + (j_.)*(x_)^(m_.))]*(g_.)))/(x_), x\_Symbol] \rightarrow \text{Simp}[\text{Log}[x]*(a + b*\text{Log}[c*(d + e*x)^n])*(f + g*\text{Log}[h*(i + j*x)^m]), x] + (-\text{Dist}[e*g*m, \text{Int}[(\text{Log}[x]*(a + b*\text{Log}[c*(d + e*x)^n])]/(d + e*x), x], x] - \text{Dist}[b*j*n, \text{Int}[(\text{Log}[x]*(f + g*\text{Log}[h*(i + j*x)^m])]/(i + j*x), x], x]) /; \text{FreeQ}[\{a, b, c, d, e, f, g, h, i, j, m, n\}, x] \&\& \text{EqQ}[e*i - d*j, 0]$

### Rule 2499

$\text{Int}[(\text{Log}[(e_.)*((f_.)*((a_.) + (b_.)*(x_)^(p_.))*((c_.) + (d_.)*(x_)^(q_.))]^(r_.)]*((s_.) + \text{Log}[(i_.)*((g_.) + (h_.)*(x_)^(n_.))]*(t_.)]^(m_.))/(j_.) + (k_.)*(x_)), x\_Symbol] \rightarrow \text{Simp}[(s + t*\text{Log}[i*(g + h*x)^n])^(m + 1)*\text{Log}[$

```
e*(f*(a + b*x)^p*(c + d*x)^q)^r)/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dist[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

### Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

### Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] := Dist[1/(b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p}, x]
```

### Rule 30

```
Int[(x_)^(m_.), x_Symbol] := Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && NeQ[m, -1]
```

### Rubi steps

$$\begin{aligned}
\int \frac{(ag + bgx)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(203c + 203dx)^3} dx &= \int \left( \frac{(-bc + ad)^2 g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{8365427d^2(c + dx)^3} - \frac{2b(bc - ad)g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{8365427d^2(c + dx)} \right) dx \\
&= \frac{(b^2g^2) \int \frac{\left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{c+dx} dx}{8365427d^2} - \frac{(2b(bc - ad)g^2) \int \frac{\left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{(c+dx)^2} dx}{8365427d^2} + \\
&= -\frac{(bc - ad)^2 g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{16730854d^3(c + dx)^2} + \frac{2b(bc - ad)g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{8365427d^3(c + dx)} \\
&= -\frac{(bc - ad)^2 g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{16730854d^3(c + dx)^2} + \frac{2b(bc - ad)g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{8365427d^3(c + dx)} \\
&= -\frac{(bc - ad)^2 g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{16730854d^3(c + dx)^2} + \frac{2b(bc - ad)g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{8365427d^3(c + dx)} \\
&= -\frac{(bc - ad)^2 g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{16730854d^3(c + dx)^2} + \frac{2b(bc - ad)g^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{8365427d^3(c + dx)} \\
&= \frac{B(bc - ad)^2 g^2 n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{16730854d^3(c + dx)^2} - \frac{3bB(bc - ad)g^2 n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{8365427d^3(c + dx)} \\
&= \frac{B(bc - ad)^2 g^2 n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{16730854d^3(c + dx)^2} - \frac{3bB(bc - ad)g^2 n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{8365427d^3(c + dx)} \\
&= \frac{B(bc - ad)^2 g^2 n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{16730854d^3(c + dx)^2} - \frac{3bB(bc - ad)g^2 n \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{8365427d^3(c + dx)} \\
&= -\frac{B^2(bc - ad)^2 g^2 n^2}{33461708d^3(c + dx)^2} + \frac{5bB^2(bc - ad)g^2 n^2}{16730854d^3(c + dx)} + \frac{5b^2B^2g^2 n^2 \log(a + bx)}{16730854d^3} + \\
&= -\frac{B^2(bc - ad)^2 g^2 n^2}{33461708d^3(c + dx)^2} + \frac{5bB^2(bc - ad)g^2 n^2}{16730854d^3(c + dx)} + \frac{5b^2B^2g^2 n^2 \log(a + bx)}{16730854d^3} + \\
&= -\frac{B^2(bc - ad)^2 g^2 n^2}{33461708d^3(c + dx)^2} + \frac{5bB^2(bc - ad)g^2 n^2}{16730854d^3(c + dx)} + \frac{5b^2B^2g^2 n^2 \log(a + bx)}{16730854d^3} +
\end{aligned}$$

**Mathematica [B]** time = 8.07997, size = 3172, normalized size = 7.19

Result too large to show

Antiderivative was successfully verified.

[In] Integrate[((a\*g + b\*g\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(c\*i + d\*i\*x)^3,x]

[Out] (g^2\*((-2\*(b\*c - a\*d)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n] - B\*n\*Log[(a + b\*x)/(c + d\*x)])^2)/(c + d\*x)^2 + (8\*b\*(b\*c - a\*d)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n] - B\*n\*Log[(a + b\*x)/(c + d\*x)])^2)/(c + d\*x) + 4\*b^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n] - B\*n\*Log[(a + b\*x)/(c + d\*x)])^2\*Log[c + d\*x] + (4\*a\*b\*B\*d\*n\*(-A - B\*Log[e\*((a + b\*x)/(c + d\*x))^n] + B\*n\*Log[(a + b\*x)/(c + d\*x)])\*(-(b^2\*c^3) + 4\*a\*b\*c^2\*d - 3\*a^2\*c\*d^2 - 2\*b^2\*c^2\*d\*x + 6\*a\*b\*c\*d^2\*x - 4\*a^2\*d^3\*x - 2\*b\*(b\*c - 2\*a\*d)\*(c + d\*x)^2\*Log[a + b\*x] + 2\*(b\*c - a\*d)^2\*(c + 2\*d\*x)\*Log[(a + b\*x)/(c + d\*x)] + 2\*b^2\*c^3\*Log[c + d\*x] - 4\*a\*b\*c^2\*d\*Log[c + d\*x] + 4\*b^2\*c^2\*d\*x\*Log[c + d\*x] - 8\*a\*b\*c\*d^2\*x\*Log[c + d\*x] + 2\*b^2\*c\*d^2\*x^2\*Log[c + d\*x] - 4\*a\*b\*d^3\*x^2\*Log[c + d\*x]))/((b\*c - a\*d)^2\*(c + d\*x)^2) + (2\*a^2\*B\*d^2\*n\*(-A - B\*Log[e\*((a + b\*x)/(c + d\*x))^n] + B\*n\*Log[(a + b\*x)/(c + d\*x)])\*(-(b^2\*c^2) + 4\*a\*b\*c\*d - a^2\*d^2 + 2\*b^2\*c\*d\*x + 2\*a\*b\*d^2\*x + 2\*b^2\*d^2\*x^2 - 2\*b^2\*(c + d\*x)^2\*Log[a/b + x] + 2\*(b\*c - a\*d)^2\*Log[(a + b\*x)/(c + d\*x)] + 2\*b^2\*c^2\*Log[(b\*(c + d\*x))/(b\*c - a\*d)] + 4\*b^2\*c\*d\*x\*Log[(b\*(c + d\*x))/(b\*c - a\*d)] + 2\*b^2\*d^2\*x^2\*Log[(b\*(c + d\*x))/(b\*c - a\*d)))/((b\*c - a\*d)^2\*(c + d\*x)^2) + 2\*b^2\*B\*n\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n] - B\*n\*Log[(a + b\*x)/(c + d\*x)])\*(-2\*Log[c/d + x]^2 - (8\*c\*(1 + Log[c/d + x]))/(c + d\*x) + (c^2\*(1 + 2\*Log[c/d + x]))/(c + d\*x)^2 + 8\*c\*(Log[a/b + x]/(c + d\*x) + (b\*(Log[a + b\*x] - Log[c + d\*x]))/(-(b\*c) + a\*d)) + 2\*(-Log[a/b + x] + Log[c/d + x] + Log[(a + b\*x)/(c + d\*x)])))\*((c\*(3\*c + 4\*d\*x))/(c + d\*x)^2 + 2\*Log[c + d\*x] + (2\*c^2\*(-Log[a/b + x] + (b\*(c + d\*x)\*(b\*c - a\*d + b\*(c + d\*x)\*Log[a + b\*x] - b\*(c + d\*x)\*Log[c + d\*x]))/(b\*c - a\*d)^2))/((c + d\*x)^2 + 4\*(Log[a/b + x]\*Log[(b\*(c + d\*x))/(b\*c - a\*d)] + PolyLog[2, (d\*(a + b\*x))/(-(b\*c) + a\*d)])) + (2\*a\*b\*B^2\*d\*n^2\*(2\*c\*Log[(a + b\*x)/(c + d\*x)]^2 - 4\*(c + d\*x)\*Log[(a + b\*x)/(c + d\*x)]^2 - (4\*(c + d\*x)\*(2\*b\*c - 2\*a\*d + 2\*b\*(c + d\*x)\*Log[a + b\*x] - 2\*(b\*c - a\*d)\*Log[(a + b\*x)/(c + d\*x)] - 2\*b\*(c + d\*x)\*Log[a + b\*x]\*Log[(a + b\*x)/(c + d\*x)] - 2\*b\*(c + d\*x)\*Log[c + d\*x] - 2\*b\*(c + d\*x)\*Log[(a + b\*x)/(c + d\*x)]\*Log[(b\*c - a\*d)/(b\*c + b\*d\*x)] + b\*(c + d\*x)\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]) - 2\*PolyLog[2, (d\*(a + b\*x))/(-(b\*c) + a\*d)]) + b\*(c + d\*x)\*(Log[(b\*c - a\*d)/(b\*c + b\*d\*x)]\*(2\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)] + Log[(b\*c - a\*d)/(b\*c + b\*d\*x)]) - 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])))/((b\*c - a\*d) + (c\*((b\*c - a\*d)^2 + 2\*b\*(b\*c - a\*d)\*(c + d\*x) + 2\*b^2\*(c + d\*x)^2\*Log[a + b\*x] - 2\*(b\*c - a\*d)^2\*Log[(a + b\*x)/(c + d\*x)] - 4\*b\*(b\*c - a\*d)\*(c + d\*x)\*Log[(a + b\*x)/(c + d\*x)] - 4\*b^2\*(c + d\*x)^2\*

$$\begin{aligned}
& \text{Log}[a + b*x]*\text{Log}[(a + b*x)/(c + d*x)] - 2*b^2*(c + d*x)^2*\text{Log}[c + d*x] + 4* \\
& b*(c + d*x)*(b*c - a*d + b*(c + d*x)*\text{Log}[a + b*x] - b*(c + d*x)*\text{Log}[c + d*x] \\
& ) - 4*b^2*(c + d*x)^2*\text{Log}[(a + b*x)/(c + d*x)]*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] \\
& + 2*b^2*(c + d*x)^2*(\text{Log}[a + b*x]*(\text{Log}[a + b*x] - 2*\text{Log}[(b*(c + d*x))/(b*c - a*d)]) \\
& ) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-(b*c) + a*d)] + 2*b^2*(c + d*x)^2*(\text{Log}[(b*c - a*d)/(b*c + b*d*x)]*(2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] + \\
& \text{Log}[(b*c - a*d)/(b*c + b*d*x)]) - 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]) \\
& )/(b*c - a*d)^2)/(c + d*x)^2 - (a^2*B^2*d^2*n^2*((b*c - a*d)^2 + 2*b*(b*c - a*d)*(c + d*x) + 2*b^2*(c + d*x)^2*\text{Log}[a + b*x] - 2*(b*c - a*d)^2*\text{Log}[(a + b*x)/(c + d*x)] - 4*b*(b*c - a*d)*(c + d*x)*\text{Log}[(a + b*x)/(c + d*x)] - 4*b^2*(c + d*x)^2*\text{Log}[a + b*x]*\text{Log}[(a + b*x)/(c + d*x)] + 2*(b*c - a*d)^2*\text{Log}[(a + b*x)/(c + d*x)]^2 - 2*b^2*(c + d*x)^2*\text{Log}[c + d*x] + 4*b*(c + d*x)*(b*c - a*d + b*(c + d*x)*\text{Log}[a + b*x] - b*(c + d*x)*\text{Log}[c + d*x]) - 4*b^2*(c + d*x)^2*\text{Log}[(a + b*x)/(c + d*x)]*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] + 2*b^2*(c + d*x)^2*(\text{Log}[a + b*x]*(\text{Log}[a + b*x] - 2*\text{Log}[(b*(c + d*x))/(b*c - a*d)]) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-(b*c) + a*d)] + 2*b^2*(c + d*x)^2*(\text{Log}[(b*c - a*d)/(b*c + b*d*x)]*(2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] + \text{Log}[(b*c - a*d)/(b*c + b*d*x)]) - 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d)^2*(c + d*x)^2 - 2*b^2*B^2*n^2*((c^2*\text{Log}[(a + b*x)/(c + d*x)]^2)/(c + d*x)^2 - (4*c*\text{Log}[(a + b*x)/(c + d*x)]^2)/(c + d*x) + 2*\text{Log}[(a + b*x)/(c + d*x)]^2*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] + 4*\text{Log}[(a + b*x)/(c + d*x)]*\text{PolyLog}[2, (d*(a + b*x))/(b*(c + d*x))] - (4*c*(2*b*c - 2*a*d + 2*b*(c + d*x)*\text{Log}[a + b*x] - 2*(b*c - a*d)*\text{Log}[(a + b*x)/(c + d*x)] - 2*b*(c + d*x)*\text{Log}[a + b*x]*\text{Log}[(a + b*x)/(c + d*x)] - 2*b*(c + d*x)*\text{Log}[(a + b*x)/(c + d*x)]*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] + b*(c + d*x)*(\text{Log}[a + b*x]*(\text{Log}[a + b*x] - 2*\text{Log}[(b*(c + d*x))/(b*c - a*d)]) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-(b*c) + a*d)] + b*(c + d*x)*(\text{Log}[(b*c - a*d)/(b*c + b*d*x)]*(2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] + \text{Log}[(b*c - a*d)/(b*c + b*d*x)]) - 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d)*(c + d*x) + (c^2*((b*c - a*d)^2 + 2*b*(b*c - a*d)*(c + d*x) + 2*b^2*(c + d*x)^2*\text{Log}[a + b*x] - 2*(b*c - a*d)^2*\text{Log}[(a + b*x)/(c + d*x)] - 4*b*(b*c - a*d)*(c + d*x)*\text{Log}[(a + b*x)/(c + d*x)] - 4*b^2*(c + d*x)^2*\text{Log}[a + b*x]*\text{Log}[(a + b*x)/(c + d*x)] - 2*b^2*(c + d*x)^2*\text{Log}[c + d*x] + 4*b*(c + d*x)*(b*c - a*d + b*(c + d*x)*\text{Log}[a + b*x] - b*(c + d*x)*\text{Log}[c + d*x]) - 4*b^2*(c + d*x)^2*\text{Log}[(a + b*x)/(c + d*x)]*\text{Log}[(b*c - a*d)/(b*c + b*d*x)] + 2*b^2*(c + d*x)^2*(\text{Log}[a + b*x]*(\text{Log}[a + b*x] - 2*\text{Log}[(b*(c + d*x))/(b*c - a*d)]) - 2*\text{PolyLog}[2, (d*(a + b*x))/(-(b*c) + a*d)] + 2*b^2*(c + d*x)^2*(\text{Log}[(b*c - a*d)/(b*c + b*d*x)]*(2*\text{Log}[(d*(a + b*x))/(-(b*c) + a*d)] + \text{Log}[(b*c - a*d)/(b*c + b*d*x)]) - 2*\text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)])))/(2*(b*c - a*d)^2*(c + d*x)^2 - 4*\text{PolyLog}[3, (d*(a + b*x))/(b*(c + d*x))]))/(4*d^3*i^3)
\end{aligned}$$



**Maple [F]** time = 0.71, size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^2}{(dix + ci)^3} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i)^3,x)

[Out] int((b\*g\*x+a\*g)^2\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i)^3,x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^2\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i)^3,x,  
algorithm="maxima")

[Out] A\*B\*a\*b\*g^2\*n\*((b\*c^2 - 3\*a\*c\*d + 2\*(b\*c\*d - 2\*a\*d^2)\*x)/((b\*c\*d^4 - a\*d^5)  
\*i^3\*x^2 + 2\*(b\*c^2\*d^3 - a\*c\*d^4)\*i^3\*x + (b\*c^3\*d^2 - a\*c^2\*d^3)\*i^3) + 2  
\*(b^2\*c - 2\*a\*b\*d)\*log(b\*x + a)/((b^2\*c^2\*d^2 - 2\*a\*b\*c\*d^3 + a^2\*d^4)\*i^3)  
- 2\*(b^2\*c - 2\*a\*b\*d)\*log(d\*x + c)/((b^2\*c^2\*d^2 - 2\*a\*b\*c\*d^3 + a^2\*d^4)\*  
i^3)) + 1/2\*A\*B\*a^2\*g^2\*n\*((2\*b\*d\*x + 3\*b\*c - a\*d)/((b\*c\*d^3 - a\*d^4)\*i^3\*x  
^2 + 2\*(b\*c^2\*d^2 - a\*c\*d^3)\*i^3\*x + (b\*c^3\*d - a\*c^2\*d^2)\*i^3) + 2\*b^2\*log  
(b\*x + a)/((b^2\*c^2\*d - 2\*a\*b\*c\*d^2 + a^2\*d^3)\*i^3) - 2\*b^2\*log(d\*x + c)/((  
b^2\*c^2\*d - 2\*a\*b\*c\*d^2 + a^2\*d^3)\*i^3)) + 1/2\*A^2\*b^2\*g^2\*((4\*c\*d\*x + 3\*c^  
2)/(d^5\*i^3\*x^2 + 2\*c\*d^4\*i^3\*x + c^2\*d^3\*i^3) + 2\*log(d\*x + c)/(d^3\*i^3))  
- 2\*(2\*d\*x + c)\*A\*B\*a\*b\*g^2\*log(e\*(b\*x/(d\*x + c) + a/(d\*x + c))^n)/(d^4\*i^3  
\*x^2 + 2\*c\*d^3\*i^3\*x + c^2\*d^2\*i^3) - (2\*d\*x + c)\*A^2\*a\*b\*g^2/(d^4\*i^3\*x^2  
+ 2\*c\*d^3\*i^3\*x + c^2\*d^2\*i^3) - A\*B\*a^2\*g^2\*log(e\*(b\*x/(d\*x + c) + a/(d\*x  
+ c))^n)/(d^3\*i^3\*x^2 + 2\*c\*d^2\*i^3\*x + c^2\*d\*i^3) - 1/2\*A^2\*a^2\*g^2/(d^3\*i  
^3\*x^2 + 2\*c\*d^2\*i^3\*x + c^2\*d\*i^3) + 1/2\*(4\*(b^2\*c\*d\*g^2 - a\*b\*d^2\*g^2)\*B^  
2\*x + (3\*b^2\*c^2\*g^2 - 2\*a\*b\*c\*d\*g^2 - a^2\*d^2\*g^2)\*B^2 + 2\*(B^2\*b^2\*d^2\*g^  
2\*x^2 + 2\*B^2\*b^2\*c\*d\*g^2\*x + B^2\*b^2\*c^2\*g^2)\*log(d\*x + c))\*log((d\*x + c)^  
n)^2/(d^5\*i^3\*x^2 + 2\*c\*d^4\*i^3\*x + c^2\*d^3\*i^3) - integrate(-(2\*B^2\*a\*b\*d^  
2\*g^2\*x\*log(e)^2 + B^2\*a^2\*d^2\*g^2\*log(e)^2 + (B^2\*b^2\*d^2\*g^2\*log(e)^2 + 2  
\*A\*B\*b^2\*d^2\*g^2\*log(e))\*x^2 + (B^2\*b^2\*d^2\*g^2\*x^2 + 2\*B^2\*a\*b\*d^2\*g^2\*x +  
B^2\*a^2\*d^2\*g^2)\*log((b\*x + a)^n)^2 + 2\*(2\*B^2\*a\*b\*d^2\*g^2\*x\*log(e) + B^2\*  
a^2\*d^2\*g^2\*log(e) + (B^2\*b^2\*d^2\*g^2\*log(e) + A\*B\*b^2\*d^2\*g^2)\*x^2)\*log((b

$$\begin{aligned} & *x + a)^n) - (4*(b^2*c*d*g^2*n - (g^2*n - g^2*\log(e))*a*b*d^2)*B^2*x + (3*b \\ & ^2*c^2*g^2*n - 2*a*b*c*d*g^2*n - (g^2*n - 2*g^2*\log(e))*a^2*d^2)*B^2 + 2*(B \\ & ^2*b^2*d^2*g^2*\log(e) + A*B*b^2*d^2*g^2)*x^2 + 2*(B^2*b^2*d^2*g^2*n*x^2 + 2 \\ & *B^2*b^2*c*d*g^2*n*x + B^2*b^2*c^2*g^2*n)*\log(d*x + c) + 2*(B^2*b^2*d^2*g^2 \\ & *x^2 + 2*B^2*a*b*d^2*g^2*x + B^2*a^2*d^2*g^2)*\log((b*x + a)^n))*\log((d*x + \\ & c)^n))/(d^5*i^3*x^3 + 3*c*d^4*i^3*x^2 + 3*c^2*d^3*i^3*x + c^3*d^2*i^3), x) \end{aligned}$$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{A^2 b^2 g^2 x^2 + 2 A^2 a b g^2 x + A^2 a^2 g^2 + (B^2 b^2 g^2 x^2 + 2 B^2 a b g^2 x + B^2 a^2 g^2) \log \left( e \left( \frac{b x + a}{d x + c} \right)^n \right)^2 + 2 (A B b^2 g^2 x^2 + 2 A B a b g^2 x + A^2 a^2 g^2) \log \left( \frac{b x + a}{d x + c} \right)^n}{d^3 i^3 x^3 + 3 c d^2 i^3 x^2 + 3 c^2 d i^3 x + c^3 i^3}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x,
algorithm="fricas")
```

```
[Out] integral((A^2*b^2*g^2*x^2 + 2*A^2*a*b*g^2*x + A^2*a^2*g^2 + (B^2*b^2*g^2*x^2
+ 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log(e*((b*x + a)/(d*x + c))^n))^2 + 2*(A*
B*b^2*g^2*x^2 + 2*A*B*a*b*g^2*x + A*B*a^2*g^2)*log(e*((b*x + a)/(d*x + c))^
n))/(d^3*i^3*x^3 + 3*c*d^2*i^3*x^2 + 3*c^2*d*i^3*x + c^3*i^3), x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*((b*x+a)/(d*x+c)**n))**2/(d*i*x+c*i)**3
,x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^2 \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2}{(dix + ci)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x,
algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(d*i*x +
c*i)^3, x)
```

$$3.204 \quad \int \frac{(ag+bgx) \left( A+B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(ci+dx)^3} dx$$

**Optimal.** Leaf size=151

$$\frac{g(a+bx)^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)^2}{2i^3(c+dx)^2(bc-ad)} - \frac{Bgn(a+bx)^2 \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{2i^3(c+dx)^2(bc-ad)} + \frac{B^2gn^2(a+bx)^2}{4i^3(c+dx)^2(bc-ad)}$$

[Out]  $(B^2 * g * n^2 * (a + b * x)^2) / (4 * (b * c - a * d) * i^3 * (c + d * x)^2) - (B * g * n * (a + b * x)^2 * (A + B * \text{Log}[e * ((a + b * x) / (c + d * x))^n])) / (2 * (b * c - a * d) * i^3 * (c + d * x)^2) + (g * (a + b * x)^2 * (A + B * \text{Log}[e * ((a + b * x) / (c + d * x))^n])^2) / (2 * (b * c - a * d) * i^3 * (c + d * x)^2)$

**Rubi [C]** time = 1.99646, antiderivative size = 686, normalized size of antiderivative = 4.54, number of steps used = 54, number of rules used = 11, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.256$ , Rules used = {2528, 2525, 12, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 44}

$$\frac{b^2 B^2 g n^2 \text{PolyLog} \left( 2, -\frac{d(a+bx)}{bc-ad} \right)}{d^2 i^3 (bc-ad)} + \frac{b^2 B^2 g n^2 \text{PolyLog} \left( 2, \frac{b(c+dx)}{bc-ad} \right)}{d^2 i^3 (bc-ad)} + \frac{b^2 B g n \log(a+bx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{d^2 i^3 (bc-ad)} - \frac{b^2 B g n \log(a+bx)}{d^2 i^3 (bc-ad)}$$

Antiderivative was successfully verified.

[In]  $\text{Int} \left[ \left( (a * g + b * g * x) * (A + B * \text{Log}[e * ((a + b * x) / (c + d * x))^n]) \right)^2 / (c * i + d * i * x)^3, x \right]$

[Out]  $(B^2 * (b * c - a * d) * g * n^2) / (4 * d^2 * i^3 * (c + d * x)^2) - (b * B^2 * g * n^2) / (2 * d^2 * i^3 * (c + d * x)) - (b^2 * B^2 * g * n^2 * \text{Log}[a + b * x]) / (2 * d^2 * (b * c - a * d) * i^3) - (b^2 * B^2 * g * n^2 * \text{Log}[a + b * x]^2) / (2 * d^2 * (b * c - a * d) * i^3) - (B * (b * c - a * d) * g * n * (A + B * \text{Log}[e * ((a + b * x) / (c + d * x))^n])) / (2 * d^2 * i^3 * (c + d * x)^2) + (b * B * g * n * (A + B * \text{Log}[e * ((a + b * x) / (c + d * x))^n])) / (d^2 * i^3 * (c + d * x)) + (b^2 * B * g * n * \text{Log}[a + b * x] * (A + B * \text{Log}[e * ((a + b * x) / (c + d * x))^n])) / (d^2 * (b * c - a * d) * i^3) + ((b * c - a * d) * g * (A + B * \text{Log}[e * ((a + b * x) / (c + d * x))^n])^2) / (2 * d^2 * i^3 * (c + d * x)^2) - (b * g * (A + B * \text{Log}[e * ((a + b * x) / (c + d * x))^n])^2) / (d^2 * i^3 * (c + d * x)) + (b^2 * B^2 * g * n^2 * \text{Log}[c + d * x]) / (2 * d^2 * (b * c - a * d) * i^3) + (b^2 * B^2 * g * n^2 * \text{Log}[-((d * (a + b * x)) / (b * c - a * d))] * \text{Log}[c + d * x]) / (d^2 * (b * c - a * d) * i^3) - (b^2 * B * g * n * (A + B * \text{Log}[e * ((a + b * x) / (c + d * x))^n]) * \text{Log}[c + d * x]) / (d^2 * (b * c - a * d) * i^3) - (b^2 * B^2 * g * n^2 * \text{Log}[c + d * x]^2) / (2 * d^2 * (b * c - a * d) * i^3) + (b^2 * B^2 * g * n^2 * \text{Log}[a + b * x] * \text{Log}[(b * (c + d * x)) / (b * c - a * d)]) / (d^2 * (b * c - a * d) * i^3) + (b^2 * B^2$

$*g^n^2 \text{PolyLog}[2, -((d*(a + b*x))/(b*c - a*d))]/(d^2*(b*c - a*d)*i^3) + (b^2*B^2*g^n^2 \text{PolyLog}[2, (b*(c + d*x))/(b*c - a*d)]/(d^2*(b*c - a*d)*i^3)$

### Rule 2528

`Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]`

### Rule 2525

`Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]`

### Rule 12

`Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_) /; FreeQ[b, x]]`

### Rule 2524

`Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]`

### Rule 2418

`Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]`

### Rule 2390

`Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]`

Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] := Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] := -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

Rule 44

Int[((a\_) + (b\_.)\*(x\_)^(m\_.))\*((c\_.) + (d\_.)\*(x\_)^(n\_.)), x\_Symbol] := Int[ExpandIntegrand[(a + b\*x)^m\*(c + d\*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b\*c - a\*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])

Rubi steps

$$\begin{aligned}
\int \frac{(ag + bgx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(204c + 204dx)^3} dx &= \int \left( \frac{(-bc + ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{8489664d(c + dx)^3} + \frac{bg \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{8489664d(c + dx)^2} \right) dx \\
&= \frac{(bg) \int \frac{\left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(c+dx)^2} dx}{8489664d} - \frac{((bc - ad)g) \int \frac{\left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{(c+dx)^3} dx}{8489664d} \\
&= \frac{(bc - ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{16979328d^2(c + dx)^2} - \frac{bg \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{8489664d^2(c + dx)} + \frac{(bBg)}{16979328d^2(c + dx)^2} \\
&= \frac{(bc - ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{16979328d^2(c + dx)^2} - \frac{bg \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{8489664d^2(c + dx)} + \frac{(bB)}{16979328d^2(c + dx)^2} \\
&= \frac{(bc - ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{16979328d^2(c + dx)^2} - \frac{bg \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{8489664d^2(c + dx)} + \frac{(bB)}{16979328d^2(c + dx)^2} \\
&= \frac{(bc - ad)g \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{16979328d^2(c + dx)^2} - \frac{bg \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{8489664d^2(c + dx)} + \frac{(bBg)}{16979328d^2(c + dx)^2} \\
&= -\frac{B(bc - ad)gn \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{16979328d^2(c + dx)^2} + \frac{bBgn \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{8489664d^2(c + dx)} + \frac{B}{16979328d^2(c + dx)^2} \\
&= -\frac{B(bc - ad)gn \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{16979328d^2(c + dx)^2} + \frac{bBgn \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{8489664d^2(c + dx)} + \frac{B}{16979328d^2(c + dx)^2} \\
&= -\frac{B(bc - ad)gn \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{16979328d^2(c + dx)^2} + \frac{bBgn \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{8489664d^2(c + dx)} + \frac{B}{16979328d^2(c + dx)^2} \\
&= \frac{B^2(bc - ad)gn^2}{33958656d^2(c + dx)^2} - \frac{bB^2gn^2}{16979328d^2(c + dx)} - \frac{b^2B^2gn^2 \log(a + bx)}{16979328d^2(bc - ad)} - \frac{B}{16979328d^2(c + dx)^2} \\
&= \frac{B^2(bc - ad)gn^2}{33958656d^2(c + dx)^2} - \frac{bB^2gn^2}{16979328d^2(c + dx)} - \frac{b^2B^2gn^2 \log(a + bx)}{16979328d^2(bc - ad)} - \frac{b^2}{16979328d^2(c + dx)^2} \\
&= \frac{B^2(bc - ad)gn^2}{33958656d^2(c + dx)^2} - \frac{bB^2gn^2}{16979328d^2(c + dx)} - \frac{b^2B^2gn^2 \log(a + bx)}{16979328d^2(bc - ad)} - \frac{b^2}{16979328d^2(c + dx)^2}
\end{aligned}$$

**Mathematica [C]** time = 0.949506, size = 803, normalized size = 5.32

$$g \left( 2(bc - ad)^2 \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 - 4b(bc - ad)(c + dx) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) + 4bBn(c + dx) \left( 2(bc - ad) \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) \right)^2 \right)$$

Antiderivative was successfully verified.

[In] Integrate[((a\*g + b\*g\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2)/(c\*i + d\*i\*x)^3,x]

[Out] (g\*(2\*(b\*c - a\*d)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2 - 4\*b\*(b\*c - a\*d)\*(c + d\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2 + 4\*b\*B\*n\*(c + d\*x)\*(2\*(b\*c - a\*d)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 2\*b\*(c + d\*x)\*Log[a + b\*x]\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 2\*b\*(c + d\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[c + d\*x] - 2\*B\*n\*(b\*c - a\*d + b\*(c + d\*x)\*Log[a + b\*x] - b\*(c + d\*x)\*Log[c + d\*x]) - b\*B\*n\*(c + d\*x)\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]) - 2\*PolyLog[2, (d\*(a + b\*x))/(-(b\*c) + a\*d)]) + b\*B\*n\*(c + d\*x)\*((2\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)] - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])) - B\*n\*(2\*(b\*c - a\*d)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 4\*b\*(b\*c - a\*d)\*(c + d\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 4\*b^2\*(c + d\*x)^2\*Log[a + b\*x]\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 4\*b^2\*(c + d\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[c + d\*x] - 4\*b\*B\*n\*(c + d\*x)\*(b\*c - a\*d + b\*(c + d\*x)\*Log[a + b\*x] - b\*(c + d\*x)\*Log[c + d\*x]) - B\*n\*((b\*c - a\*d)^2 + 2\*b\*(b\*c - a\*d)\*(c + d\*x) + 2\*b^2\*(c + d\*x)^2\*Log[a + b\*x] - 2\*b^2\*(c + d\*x)^2\*Log[c + d\*x]) - 2\*b^2\*B\*n\*(c + d\*x)^2\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]) - 2\*PolyLog[2, (d\*(a + b\*x))/(-(b\*c) + a\*d)]) + 2\*b^2\*B\*n\*(c + d\*x)^2\*((2\*Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)] - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])))/(4\*d^2\*(b\*c - a\*d)\*i^3\*(c + d\*x)^2)

**Maple [F]** time = 0.527, size = 0, normalized size = 0.

$$\int \frac{bgx + ag}{(dix + ci)^3} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i)^3,x)



```
[Out] int((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x)
```

**Maxima [B]** time = 1.75734, size = 2693, normalized size = 17.83

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x, a
lgorithm="maxima")
```

```
[Out] 1/2*A*B*b*g*n*((b*c^2 - 3*a*c*d + 2*(b*c*d - 2*a*d^2)*x)/((b*c*d^4 - a*d^5)
*i^3*x^2 + 2*(b*c^2*d^3 - a*c*d^4)*i^3*x + (b*c^3*d^2 - a*c^2*d^3)*i^3) + 2
*(b^2*c - 2*a*b*d)*log(b*x + a)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*i^3)
- 2*(b^2*c - 2*a*b*d)*log(d*x + c)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*
i^3)) + 1/2*A*B*a*g*n*((2*b*d*x + 3*b*c - a*d)/((b*c*d^3 - a*d^4)*i^3*x^2 +
2*(b*c^2*d^2 - a*c*d^3)*i^3*x + (b*c^3*d - a*c^2*d^2)*i^3) + 2*b^2*log(b*x
+ a)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3) - 2*b^2*log(d*x + c)/((b^2*
c^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3)) - 1/2*(2*d*x + c)*B^2*b*g*log(e*(b*x/(
d*x + c) + a/(d*x + c))^n)^2/(d^4*i^3*x^2 + 2*c*d^3*i^3*x + c^2*d^2*i^3) +
1/4*(2*n*((2*b*d*x + 3*b*c - a*d)/((b*c*d^3 - a*d^4)*i^3*x^2 + 2*(b*c^2*d^2
- a*c*d^3)*i^3*x + (b*c^3*d - a*c^2*d^2)*i^3) + 2*b^2*log(b*x + a)/((b^2*c
^2*d - 2*a*b*c*d^2 + a^2*d^3)*i^3) - 2*b^2*log(d*x + c)/((b^2*c^2*d - 2*a*b
*c*d^2 + a^2*d^3)*i^3))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) - (7*b^2*c^2
- 8*a*b*c*d + a^2*d^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x +
a)^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(d*x + c)^2 + 6*(b^2*c*d
- a*b*d^2)*x + 6*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x + a) - 2*(3*
b^2*d^2*x^2 + 6*b^2*c*d*x + 3*b^2*c^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*
c^2)*log(b*x + a))*log(d*x + c))*n^2/(b^2*c^4*d*i^3 - 2*a*b*c^3*d^2*i^3 + a
^2*c^2*d^3*i^3 + (b^2*c^2*d^3*i^3 - 2*a*b*c*d^4*i^3 + a^2*d^5*i^3)*x^2 + 2*
(b^2*c^3*d^2*i^3 - 2*a*b*c^2*d^3*i^3 + a^2*c*d^4*i^3)*x)*B^2*a*g + 1/4*(2*
n*((b*c^2 - 3*a*c*d + 2*(b*c*d - 2*a*d^2)*x)/((b*c*d^4 - a*d^5)*i^3*x^2 + 2
*(b*c^2*d^3 - a*c*d^4)*i^3*x + (b*c^3*d^2 - a*c^2*d^3)*i^3) + 2*(b^2*c - 2*
a*b*d)*log(b*x + a)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*i^3) - 2*(b^2*c
- 2*a*b*d)*log(d*x + c)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*i^3))*log(e*
(b*x/(d*x + c) + a/(d*x + c))^n) - (b^2*c^3 - 8*a*b*c^2*d + 7*a^2*c*d^2 + 2
*(b^2*c^3 - 2*a*b*c^2*d + (b^2*c*d^2 - 2*a*b*d^3)*x^2 + 2*(b^2*c^2*d - 2*a*
b*c*d^2)*x)*log(b*x + a)^2 + 2*(b^2*c^3 - 2*a*b*c^2*d + (b^2*c*d^2 - 2*a*b*
d^3)*x^2 + 2*(b^2*c^2*d - 2*a*b*c*d^2)*x)*log(d*x + c)^2 + 2*(b^2*c^2*d - 5
*a*b*c*d^2 + 4*a^2*d^3)*x + 2*(b^2*c^3 - 4*a*b*c^2*d + (b^2*c*d^2 - 4*a*b*d
^3)*x^2 + 2*(b^2*c^2*d - 4*a*b*c*d^2)*x)*log(b*x + a) - 2*(b^2*c^3 - 4*a*b*
c^2*d + (b^2*c*d^2 - 4*a*b*d^3)*x^2 + 2*(b^2*c^2*d - 4*a*b*c*d^2)*x + 2*(b^
```

$$2c^3 - 2abc^2d + (b^2cd^2 - 2abd^3)x^2 + 2(b^2c^2d - 2abc^2d^2)x \log(bx + a) \log(dx + c) n^2 / (b^2c^4d^2i^3 - 2abc^3d^3i^3 + a^2c^2d^4i^3 + (b^2c^2d^4i^3 - 2abc^2d^5i^3 + a^2d^6i^3)x^2 + 2(b^2c^3d^3i^3 - 2abc^2d^4i^3 + a^2cd^5i^3)x) B^2b^2g - (2dx + c) A B b^2g \log(e(bx/(dx + c) + a/(dx + c))^n) / (d^4i^3x^2 + 2cd^3i^3x + c^2d^2i^3) - 1/2 B^2a^2g \log(e(bx/(dx + c) + a/(dx + c))^n) / (d^3i^3x^2 + 2cd^2i^3x + c^2di^3) - 1/2 (2dx + c) A^2b^2g / (d^4i^3x^2 + 2cd^3i^3x + c^2d^2i^3) - A B a^2g \log(e(bx/(dx + c) + a/(dx + c))^n) / (d^3i^3x^2 + 2cd^2i^3x + c^2di^3) - 1/2 A^2a^2g / (d^3i^3x^2 + 2cd^2i^3x + c^2di^3)$$

**Fricas [B]** time = 0.569616, size = 1214, normalized size = 8.04

$$(B^2b^2c^2 - B^2a^2d^2)gn^2 - 2(ABb^2c^2 - ABa^2d^2)gn + 2(2(B^2b^2cd - B^2abd^2)gx + (B^2b^2c^2 - B^2a^2d^2)g) \log(e)^2 - 2(B^2b^2c^2 - B^2a^2d^2)g$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i)^3,x, algorithm="fricas")

[Out]  $-1/4*((B^2b^2c^2 - B^2a^2d^2)*g*n^2 - 2*(A*B*b^2c^2 - A*B*a^2d^2)*g*n + 2*(2*(B^2b^2c*d - B^2a*b*d^2)*g*x + (B^2b^2c^2 - B^2a^2d^2)*g) \log(e)^2 - 2*(B^2b^2d^2*g*n^2*x^2 + 2*B^2a*b*d^2*g*n^2*x + B^2a^2d^2*g*n^2) \log((b*x + a)/(d*x + c))^2 + 2*(A^2b^2c^2 - A^2a^2d^2)*g + 2*((B^2b^2c*d - B^2a*b*d^2)*g*n^2 - 2*(A*B*b^2c*d - A*B*a*b*d^2)*g*n + 2*(A^2b^2c*d - A^2a*b*d^2)*g)*x - 2*((B^2b^2c^2 - B^2a^2d^2)*g*n - 2*(A*B*b^2c^2 - A*B*a^2d^2)*g + 2*((B^2b^2c*d - B^2a*b*d^2)*g*n - 2*(A*B*b^2c*d - A*B*a*b*d^2)*g)*x + 2*(B^2b^2d^2*g*n*x^2 + 2*B^2a*b*d^2*g*n*x + B^2a^2d^2*g*n) \log((b*x + a)/(d*x + c)) \log(e) + 2*(B^2a^2d^2*g*n^2 - 2*A*B*a^2d^2*g*n + (B^2b^2d^2*g*n^2 - 2*A*B*b^2d^2*g*n)*x^2 + 2*(B^2a*b*d^2*g*n^2 - 2*A*B*a*b*d^2*g*n)*x) \log((b*x + a)/(d*x + c)) / ((b*c*d^4 - a*d^5)*i^3*x^2 + 2*(b*c^2*d^3 - a*c*d^4)*i^3*x + (b*c^3*d^2 - a*c^2*d^3)*i^3)$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*i*x+c*i)**3,x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag) \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2}{(dix + ci)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*i*x+c*i)^3,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(d*i*x + c*i)^3, x)
```

$$3.205 \quad \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ci+dx)^3} dx$$

**Optimal.** Leaf size=317

$$\frac{Bdn(a+bx)^2 \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{2i^3(c+dx)^2(bc-ad)^2} + \frac{b(a+bx) \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)^2}{i^3(c+dx)(bc-ad)^2} - \frac{d(a+bx)^2 \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)^2}{2i^3(c+dx)^2(bc-ad)^2} - \frac{2}{i^3(c+dx)}$$

[Out]  $-(B^2*d*n^2*(a+b*x)^2)/(4*(b*c-a*d)^2*i^3*(c+d*x)^2) - (2*A*b*B*n*(a+b*x))/((b*c-a*d)^2*i^3*(c+d*x)) + (2*b*B^2*n^2*(a+b*x))/((b*c-a*d)^2*i^3*(c+d*x)) - (2*b*B^2*n*(a+b*x)*Log[e*((a+b*x)/(c+d*x))^n])/((b*c-a*d)^2*i^3*(c+d*x)) + (B*d*n*(a+b*x)^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(2*(b*c-a*d)^2*i^3*(c+d*x)^2) - (d*(a+b*x)^2*(A+B*Log[e*((a+b*x)/(c+d*x))^n])^2)/(2*(b*c-a*d)^2*i^3*(c+d*x)^2) + (b*(a+b*x)*(A+B*Log[e*((a+b*x)/(c+d*x))^n])^2)/((b*c-a*d)^2*i^3*(c+d*x))$

**Rubi [C]** time = 0.879406, antiderivative size = 626, normalized size of antiderivative = 1.97, number of steps used = 28, number of rules used = 11, integrand size = 35,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.314$ , Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 44}

$$\frac{b^2 B^2 n^2 \text{PolyLog}\left(2, -\frac{d(a+bx)}{bc-ad}\right)}{di^3(bc-ad)^2} + \frac{b^2 B^2 n^2 \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right)}{di^3(bc-ad)^2} + \frac{b^2 B n \log(a+bx) \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{di^3(bc-ad)^2} - \frac{b^2 B n \log(c+dx)}{di^3(bc-ad)^2}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2/(c\*i + d\*i\*x)^3,x]

[Out]  $-(B^2*n^2)/(4*d*i^3*(c+d*x)^2) - (3*b*B^2*n^2)/(2*d*(b*c-a*d)*i^3*(c+d*x)) - (3*b^2*B^2*n^2*Log[a+b*x])/(2*d*(b*c-a*d)^2*i^3) - (b^2*B^2*n^2*Log[a+b*x]^2)/(2*d*(b*c-a*d)^2*i^3) + (B*n*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(2*d*i^3*(c+d*x)^2) + (b*B*n*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(d*(b*c-a*d)*i^3*(c+d*x)) + (b^2*B*n*Log[a+b*x]*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/(d*(b*c-a*d)^2*i^3) - (A+B*Log[e*((a+b*x)/(c+d*x))^n])^2/(2*d*i^3*(c+d*x)^2) + (3*b^2*B^2*n^2*Log[c+d*x])/(2*d*(b*c-a*d)^2*i^3) + (b^2*B^2*n^2*Log[-((d*(a+b*x))/(b*c-a*d))]*Log[c+d*x])/(d*(b*c-a*d)^2*i^3) - (b^2*B*n*(A+B*Log[e*((a+b*x)/(c+d*x))^n])*Log[c+d*x])/(d*(b*c-a*d)^2*i^3) - (b^2*B^2*n^2*Log[c+d*x]^2)/(2*d*(b*c-a*d)^2*i^3)$

$$\frac{d*(b*c - a*d)^{2*i^3} + (b^2*B^2*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])}{(d*(b*c - a*d)^{2*i^3} + (b^2*B^2*n^2*PolyLog[2, -(d*(a + b*x))/(b*c - a*d)])} / \frac{d*(b*c - a*d)^{2*i^3} + (b^2*B^2*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])}{(d*(b*c - a*d)^{2*i^3})}$$

### Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.), x_Symbol]
:> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]
```

### Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_) /; FreeQ[b, x]]
```

### Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]
```

### Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_.)), x_Symbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

### Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_.))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]
```

### Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_.))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)*(x_.))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
```

qQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] := Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] := -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rule 44

Int[((a\_) + (b\_.)\*(x\_)^(m\_.))\*((c\_.) + (d\_.)\*(x\_)^(n\_.)), x\_Symbol] := Int[ExpandIntegrand[(a + b\*x)^m\*(c + d\*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b\*c - a\*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])

### Rubi steps

$$\begin{aligned}
\int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(205c + 205dx)^3} dx &= -\frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17230250d(c + dx)^2} + \frac{(Bn) \int \frac{(bc-ad)\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{42025(a+bx)(c+dx)^3} dx}{205d} \\
&= -\frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17230250d(c + dx)^2} + \frac{(B(bc - ad)n) \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)(c+dx)^3} dx}{8615125d} \\
&= -\frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17230250d(c + dx)^2} + \frac{(B(bc - ad)n) \int \left(\frac{b^3\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)^3(a+bx)} - \frac{d\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)(c+dx)^3}\right) dx}{8615125d} \\
&= -\frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17230250d(c + dx)^2} - \frac{(Bn) \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(c+dx)^3} dx}{8615125} - \frac{(b^2Bn) \int \frac{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx} dx}{8615125(bc - ad)^2} \\
&= \frac{Bn\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{17230250d(c + dx)^2} + \frac{bBn\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8615125d(bc - ad)(c + dx)} + \frac{b^2Bn \log(a + bx)\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8615125d(bc - ad)(c + dx)} \\
&= \frac{Bn\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{17230250d(c + dx)^2} + \frac{bBn\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8615125d(bc - ad)(c + dx)} + \frac{b^2Bn \log(a + bx)\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8615125d(bc - ad)(c + dx)} \\
&= \frac{Bn\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{17230250d(c + dx)^2} + \frac{bBn\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8615125d(bc - ad)(c + dx)} + \frac{b^2Bn \log(a + bx)\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8615125d(bc - ad)(c + dx)} \\
&= -\frac{B^2n^2}{34460500d(c + dx)^2} - \frac{3bB^2n^2}{17230250d(bc - ad)(c + dx)} - \frac{3b^2B^2n^2 \log(a + bx)}{17230250d(bc - ad)^2} + \frac{Bn\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{17230250d} \\
&= -\frac{B^2n^2}{34460500d(c + dx)^2} - \frac{3bB^2n^2}{17230250d(bc - ad)(c + dx)} - \frac{3b^2B^2n^2 \log(a + bx)}{17230250d(bc - ad)^2} - \frac{b^2B^2n^2}{17230250d} \\
&= -\frac{B^2n^2}{34460500d(c + dx)^2} - \frac{3bB^2n^2}{17230250d(bc - ad)(c + dx)} - \frac{3b^2B^2n^2 \log(a + bx)}{17230250d(bc - ad)^2} - \frac{b^2B^2n^2}{17230250d}
\end{aligned}$$

**Mathematica [C]** time = 0.454628, size = 464, normalized size = 1.46

$$Bn\left(-2b^2Bn(c+dx)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+2b^2Bn(c+dx)^2\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)\right)$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2/(c\*i + d\*i\*x)^3,x]

[Out] (-2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2 + (B\*n\*(2\*(b\*c - a\*d)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 4\*b\*(b\*c - a\*d)\*(c + d\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) + 4\*b^2\*(c + d\*x)^2\*Log[a + b\*x]\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]) - 4\*b^2\*(c + d\*x)^2\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])\*Log[c + d\*x] - 4\*b\*B\*n\*(c + d\*x)\*(b\*c - a\*d + b\*(c + d\*x)\*Log[a + b\*x] - b\*(c + d\*x)\*Log[c + d\*x]) - B\*n\*((b\*c - a\*d)^2 + 2\*b\*(b\*c - a\*d)\*(c + d\*x) + 2\*b^2\*(c + d\*x)^2\*Log[a + b\*x] - 2\*b^2\*(c + d\*x)^2\*Log[c + d\*x]) - 2\*b^2\*B\*n\*(c + d\*x)^2\*(Log[a + b\*x]\*(Log[a + b\*x] - 2\*Log[(b\*(c + d\*x))/(b\*c - a\*d)]) - 2\*PolyLog[2, (d\*(a + b\*x))/(-b\*c + a\*d)]) + 2\*b^2\*B\*n\*(c + d\*x)^2\*((2\*Log[(d\*(a + b\*x))/(-b\*c + a\*d)] - Log[c + d\*x])\*Log[c + d\*x] + 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)])))/(b\*c - a\*d)^2/(4\*d\*i^3\*(c + d\*x)^2)

**Maple [F]** time = 0.512, size = 0, normalized size = 0.

$$\int \frac{1}{(dix + ci)^3} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i)^3,x)

[Out] int((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i)^3,x)

**Maxima [B]** time = 1.39228, size = 1162, normalized size = 3.67

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i)^3,x, algorithm="maxima")

[Out] 1/2\*A\*B\*n\*((2\*b\*d\*x + 3\*b\*c - a\*d)/((b\*c\*d^3 - a\*d^4)\*i^3\*x^2 + 2\*(b\*c^2\*d^2 - a\*c\*d^3)\*i^3\*x + (b\*c^3\*d - a\*c^2\*d^2)\*i^3) + 2\*b^2\*log(b\*x + a)/((b^2\*



$$\begin{aligned}
& c^2d - 2abc^2d^2 + a^2d^3)i^3) - 2b^2\log(dx + c)/((b^2c^2d - 2abc^2d^2 + a^2d^3)i^3) + 1/4(2n((2bdx + 3bc - ad)/((b^2c^2d - 2abc^2d^2 + a^2d^3)i^3)x^2 + 2(b^2c^2d^2 - a^2d^3)i^3x + (b^2c^3d - a^2c^2d^2)i^3) + 2b^2\log(bx + a)/((b^2c^2d - 2abc^2d^2 + a^2d^3)i^3) - 2b^2\log(dx + c)/((b^2c^2d - 2abc^2d^2 + a^2d^3)i^3))\log(e*(bx/(dx + c) + a/(dx + c))^n) - (7b^2c^2 - 8abc^2d + a^2d^2 + 2(b^2d^2x^2 + 2b^2c^2d^2x + b^2c^2)*\log(bx + a)^2 + 2(b^2d^2x^2 + 2b^2c^2d^2x + b^2c^2)*\log(bx + a) - 2(3b^2d^2x^2 + 6b^2c^2d^2x + 3b^2c^2 + 2(b^2d^2x^2 + 2b^2c^2d^2x + b^2c^2)*\log(bx + a))*\log(dx + c))*n^2/(b^2c^4d^4i^3 - 2abc^3d^2i^3 + a^2c^2d^3i^3 + (b^2c^2d^3i^3 - 2abc^2d^4i^3 + a^2d^5i^3)x^2 + 2(b^2c^3d^2i^3 - 2abc^2d^3i^3 + a^2c^2d^4i^3)x)*B^2 - 1/2B^2\log(e*(bx/(dx + c) + a/(dx + c))^n)^2/(d^3i^3x^2 + 2c^2d^2i^3x + c^2d^2i^3) - AB\log(e*(bx/(dx + c) + a/(dx + c))^n)/(d^3i^3x^2 + 2c^2d^2i^3x + c^2d^2i^3) - 1/2A^2/(d^3i^3x^2 + 2c^2d^2i^3x + c^2d^2i^3)
\end{aligned}$$

**Fricas [B]** time = 0.573039, size = 1354, normalized size = 4.27

$$2A^2b^2c^2 - 4A^2abcd + 2A^2a^2d^2 + (7B^2b^2c^2 - 8B^2abcd + B^2a^2d^2)n^2 + 2(B^2b^2c^2 - 2B^2abcd + B^2a^2d^2)\log(e)^2 - 2(E$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((bx+a)/(dx+c))^n))^2/(d\*i\*x+c\*i)^3,x, algorithm="fricas")

[Out] 
$$\begin{aligned}
& -1/4(2A^2b^2c^2 - 4A^2abc^2d + 2A^2a^2d^2 + (7B^2b^2c^2 - 8B^2abc^2d + B^2a^2d^2)*n^2 + 2(B^2b^2c^2 - 2B^2abcd + B^2a^2d^2)*\log(e)^2 - 2(B^2b^2d^2n^2x^2 + 2B^2b^2c^2d^2n^2x + (2B^2abc^2d - B^2a^2d^2)*n^2)*\log((bx + a)/(dx + c))^2 - 2(3ABb^2c^2 - 4ABabc^2d + ABa^2d^2)*n + 2(3(B^2b^2c^2d - B^2abc^2d^2)*n^2 - 2(ABb^2c^2d - ABabc^2d^2)*n)*x + 2(2ABb^2c^2 - 4ABabc^2d + 2ABa^2d^2 - 2(B^2b^2c^2d - B^2abc^2d^2)*n*x - (3B^2b^2c^2 - 4B^2abc^2d + B^2a^2d^2)*n - 2(B^2b^2d^2n^2x^2 + 2B^2b^2c^2d^2n^2x + (2B^2abc^2d - B^2a^2d^2)*n)*\log((bx + a)/(dx + c)))*\log(e) + 2((4B^2abc^2d - B^2a^2d^2)*n^2 + (3B^2b^2d^2n^2 - 2ABb^2d^2n)*x^2 - 2(2ABabc^2d - ABa^2d^2)*n - 2(2ABb^2c^2d^2n - (2B^2b^2c^2d + B^2abc^2d^2)*n^2)*x)*\log((bx + a)/(dx + c)))/((b^2c^2d^3 - 2abc^2d^4 + a^2d^5)i^3x^2 + 2(b^2c^3d^2 - 2abc^2d^3 + a^2c^2d^4)i^3x + (b^2c^4d - 2abc^3d^2 + a^2c^2d^3)i^3)
\end{aligned}$$

---

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n))\*\*2/(d\*i\*x+c\*i)\*\*3,x)

[Out] Timed out

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2}{(dix + ci)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(d\*i\*x+c\*i)^3,x, algorithm="giac")

[Out] integrate((B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)^2/(d\*i\*x + c\*i)^3, x)

$$3.206 \quad \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)(ci+dix)^3} dx$$

**Optimal.** Leaf size=402

$$\frac{b^2 \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)^3}{3Bgi^3n(bc-ad)^3} + \frac{d^2(a+bx)^2 \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)^2}{2gi^3(c+dx)^2(bc-ad)^3} - \frac{Bd^2n(a+bx)^2 \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{2gi^3(c+dx)^2(bc-ad)^3} - \frac{2bd(a+bx)}{3Bgi^3n(bc-ad)^3}$$

[Out]  $(B^2d^2n^2(a+bx)^2)/(4*(b*c - a*d)^3*gi^3*(c+dx)^2) + (4*A*b*B*d*n*(a+bx))/((b*c - a*d)^3*gi^3*(c+dx)) - (4*b*B^2*d*n^2*(a+bx))/((b*c - a*d)^3*gi^3*(c+dx)) + (4*b*B^2*d*n*(a+bx)*Log[e*((a+bx)/(c+dx))^n])/((b*c - a*d)^3*gi^3*(c+dx)) - (B*d^2*n*(a+bx)^2*(A+B*Log[e*((a+bx)/(c+dx))^n]))/(2*(b*c - a*d)^3*gi^3*(c+dx)^2) + (d^2*(a+bx)^2*(A+B*Log[e*((a+bx)/(c+dx))^n])^2)/(2*(b*c - a*d)^3*gi^3*(c+dx)^2) - (2*b*d*(a+bx)*(A+B*Log[e*((a+bx)/(c+dx))^n])^2)/((b*c - a*d)^3*gi^3*(c+dx)) + (b^2*(A+B*Log[e*((a+bx)/(c+dx))^n])^3)/(3*B*(b*c - a*d)^3*gi^3*n)$

**Rubi [C]** time = 7.04324, antiderivative size = 2025, normalized size of antiderivative = 5.04, number of steps used = 111, number of rules used = 31, integrand size = 45,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.689$ , Rules used = {2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 12, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2525, 44, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2/((a\*g + b\*g\*x)\*(c\*i + d\*i\*x)^3), x]

[Out]  $(B^2*n^2)/(4*(b*c - a*d)*gi^3*(c+dx)^2) + (7*b*B^2*n^2)/(2*(b*c - a*d)^2*gi^3*(c+dx)) + (7*b^2*B^2*n^2*Log[a+bx])/((b*c - a*d)^3*gi^3) - (A*b^2*B*n*Log[a+bx]^2)/((b*c - a*d)^3*gi^3) + (3*b^2*B^2*n^2*Log[a+bx]^2)/(2*(b*c - a*d)^3*gi^3) - (b^2*B^2*Log[-((b*c - a*d)/(d*(a+bx))])*Log[e*((a+bx)/(c+dx))^n]^2)/((b*c - a*d)^3*gi^3) - (b^2*B^2*Log[a+bx]*Log[e*((a+bx)/(c+dx))^n]^2)/((b*c - a*d)^3*gi^3) - (B*n*(A+B*Log[e*((a+bx)/(c+dx))^n]))/(2*(b*c - a*d)*gi^3*(c+dx)^2) - (3*b*B*n*(A+B*Log[e*((a+bx)/(c+dx))^n]))/((b*c - a*d)^2*gi^3*(c+dx))$

$$\begin{aligned}
& ) - (3*b^2*B^n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^3*g*i^3) + (A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(2*(b*c - a*d)*g*i^3*(c + d*x)^2) + (b*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^2*g*i^3*(c + d*x)) + (b^2*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^3*g*i^3) - (7*b^2*B^2*n^2*Log[c + d*x])/((2*(b*c - a*d)^3*g*i^3) + (2*A*b^2*B^n*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)^3*g*i^3) - (3*b^2*B^2*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)^3*g*i^3) + (b^2*B^2*Log[(a + b*x)^n]^2*Log[c + d*x])/((b*c - a*d)^3*g*i^3) + (3*b^2*B^n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/((b*c - a*d)^3*g*i^3) - (b^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[c + d*x])/((b*c - a*d)^3*g*i^3) - (A*b^2*B^n*Log[c + d*x]^2)/((b*c - a*d)^3*g*i^3) + (3*b^2*B^2*n^2*Log[c + d*x]^2)/(2*(b*c - a*d)^3*g*i^3) + (b^2*B^2*n^2*Log[a + b*x]*Log[c + d*x]^2)/((b*c - a*d)^3*g*i^3) - (b^2*B^2*n*Log[e*((a + b*x)/(c + d*x))^n]*Log[c + d*x]^2)/((b*c - a*d)^3*g*i^3) - (b^2*B^2*n^2*Log[c + d*x]^3)/(3*(b*c - a*d)^3*g*i^3) + (2*A*b^2*B^n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g*i^3) - (3*b^2*B^2*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g*i^3) - (b^2*B^2*Log[(a + b*x)^n]^2*Log[(b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g*i^3) + (2*b^2*B^2*n*Log[a + b*x]*Log[c + d*x]*Log[(c + d*x)^(-n)])/((b*c - a*d)^3*g*i^3) + (b^2*B^2*Log[a + b*x]*Log[(c + d*x)^(-n)]^2)/((b*c - a*d)^3*g*i^3) - (b^2*B^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^(-n)]^2)/((b*c - a*d)^3*g*i^3) - (2*b^2*B^2*n*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x]*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)]))/((b*c - a*d)^3*g*i^3) + (2*A*b^2*B^n*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^3*g*i^3) - (3*b^2*B^2*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^3*g*i^3) - (2*b^2*B^2*n*Log[(a + b*x)^n]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^3*g*i^3) + (2*A*b^2*B^n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g*i^3) - (3*b^2*B^2*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g*i^3) + (2*b^2*B^2*n*Log[(c + d*x)^(-n)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g*i^3) - (2*b^2*B^2*n*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g*i^3) + (2*b^2*B^2*n*Log[e*((a + b*x)/(c + d*x))^n]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^3*g*i^3) + (2*b^2*B^2*n^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])/((b*c - a*d)^3*g*i^3) + (2*b^2*B^2*n^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)^3*g*i^3) + (2*b^2*B^2*n^2*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/((b*c - a*d)^3*g*i^3)
\end{aligned}$$

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(Rfx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, Rfx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[Rfx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :=> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :=> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :=> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :=> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :=> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :=> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] :=> With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
h*x)^t]^u)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s + 1))/(p*r*(s + 1)*(b*c
- a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q]^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x]] /; FreeQ[{
```

a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && NeQ[s, -1]

### Rule 2488

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.)/((g\_.) + (h\_.)\*(x\_)), x\_Symbol] := -Simp[(Log[-((b\*c - a\*d)/(d\*(a + b\*x)))]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/h, x] + Dist[(p\*r\*s\*(b\*c - a\*d))/h, Int[(Log[-((b\*c - a\*d)/(d\*(a + b\*x)))]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1))/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && EqQ[b\*g - a\*h, 0] && IGtQ[s, 0]

### Rule 2506

Int[Log[v\_]\*Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.)\*(u\_), x\_Symbol] := With[{g = Simplify[((v - 1)\*(c + d\*x))/(a + b\*x)], h = Simplify[u\*(a + b\*x)\*(c + d\*x)]}, -Simp[(h\*PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/(b\*c - a\*d), x] + Dist[h\*p\*r\*s, Int[(PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1))/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]

### Rule 6610

Int[(u\_)\*PolyLog[n\_, v\_], x\_Symbol] := With[{w = DerivativeDivides[v, u\*v, x]}, Simp[w\*PolyLog[n + 1, v], x] /; !FalseQ[w]] /; FreeQ[n, x]

### Rule 2525

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)\*((d\_.) + (e\_.)\*(x\_))^(m\_.), x\_Symbol] := Simp[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^n)/(e\*(m + 1)), x] - Dist[(b\*n\*p)/(e\*(m + 1)), Int[SimplifyIntegrand[((d + e\*x)^(m + 1)\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

### Rule 44

Int[((a\_.) + (b\_.)\*(x\_))^(m\_.)\*((c\_.) + (d\_.)\*(x\_))^(n\_.), x\_Symbol] := Int[ExpandIntegrand[(a + b\*x)^m\*(c + d\*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b\*c - a\*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])

Rule 2500

```
Int[(Log[(e_.)*((f_.)*(a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))/((j_.) + (k
_.)*(x_)), x_Symbol] := Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] := Dist[1/e, Subst[Int[(k*x)/d]^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
e*i - d*j)/e + (j*x)/e]^m), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_))^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_))^(n_
.))*((b_.))^(p_.))/(x_), x_Symbol] := Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_))^(m_.))]*((a_.) + Log[(c_.)*(x_))^(n_.))*
((b_.))^(p_.))/(x_), x_Symbol] := -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] := Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Symbol] :=
```



Dist[1/l, Subst[Int[x^r\*(a + b\*Log[c\*(-((e\*k - d\*l)/l) + (e\*x)/l)^n])\*(f + g\*Log[h\*(-((j\*k - i\*l)/l) + (j\*x)/l)^m]), x], x, k + l\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]

### Rule 2434

Int[(((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))\*((f\_.) + Log[(h\_.)\*(i\_.) + (j\_.)\*(x\_)]^(m\_.)]\*(g\_.))/(x\_), x\_Symbol] :> Simp[Log[x]\*(a + b\*Log[c\*(d + e\*x)^n])\*(f + g\*Log[h\*(i + j\*x)^m]), x] + (-Dist[e\*g\*m, Int[(Log[x]\*(a + b\*Log[c\*(d + e\*x)^n]))/(d + e\*x), x], x] - Dist[b\*j\*n, Int[(Log[x]\*(f + g\*Log[h\*(i + j\*x)^m))]/(i + j\*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, m, n}, x] && EqQ[e\*i - d\*j, 0]

### Rule 2499

Int[(Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.))\*((c\_.) + (d\_.)\*(x\_))^(q\_.))]^(r\_.)]\*(s\_.) + Log[(i\_.)\*((g\_.) + (h\_.)\*(x\_))^(n\_.)]\*(t\_.)]^(m\_.))/(j\_.) + (k\_.)\*(x\_)), x\_Symbol] :> Simp[((s + t\*Log[i\*(g + h\*x)^n])^(m + 1)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r)]/(k\*n\*t\*(m + 1)), x] + (-Dist[(b\*p\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(a + b\*x), x], x] - Dist[(d\*q\*r)/(k\*n\*t\*(m + 1)), Int[(s + t\*Log[i\*(g + h\*x)^n])^(m + 1)/(c + d\*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0] && EqQ[h\*j - g\*k, 0] && IGtQ[m, 0]

### Rule 2396

Int[(((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))]^(p\_)/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :> Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])^p)/g, x] - Dist[(b\*e\*n\*p)/g, Int[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n])^(p - 1))/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p}, x] && NeQ[e\*f - d\*g, 0] && IGtQ[p, 1]

### Rule 2302

Int[(((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))]^(p\_)/(x\_), x\_Symbol] :> Dist[1/(b\*n), Subst[Int[x^p, x], x, a + b\*Log[c\*x^n]], x] /; FreeQ[{a, b, c, n, p}, x]

### Rule 30

Int[(x\_)^(m\_.), x\_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && NeQ[m, -1]

### Rubi steps

$$\begin{aligned}
\int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(206c + 206dx)^3(ag + bgx)} dx &= \int \left[ \frac{b^3 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8741816(bc - ad)^3g(a + bx)} - \frac{d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8741816(bc - ad)g(c + dx)^3} - \frac{bd \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8741816(bc - ad)^2g} \right] dx \\
&= \frac{b^3 \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx} dx}{8741816(bc - ad)^3g} - \frac{(b^2d) \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx} dx}{8741816(bc - ad)^3g} - \frac{(bd) \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(c+dx)^2} dx}{8741816(bc - ad)^2g} \\
&= \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17483632(bc - ad)g(c + dx)^2} + \frac{b \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8741816(bc - ad)^2g(c + dx)} + \frac{b^2 \log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8741816(bc - ad)^2g} \\
&= \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17483632(bc - ad)g(c + dx)^2} + \frac{b \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8741816(bc - ad)^2g(c + dx)} + \frac{b^2 \log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8741816(bc - ad)^2g} \\
&= \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17483632(bc - ad)g(c + dx)^2} + \frac{b \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8741816(bc - ad)^2g(c + dx)} + \frac{b^2 \log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8741816(bc - ad)^2g} \\
&= \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17483632(bc - ad)g(c + dx)^2} + \frac{b \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8741816(bc - ad)^2g(c + dx)} + \frac{b^2 \log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8741816(bc - ad)^2g} \\
&= -\frac{Bn \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{17483632(bc - ad)g(c + dx)^2} - \frac{3bBn \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8741816(bc - ad)^2g(c + dx)} - \frac{3b^2Bn \log(a + bx) \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8741816(bc - ad)^2g} \\
&= -\frac{b^2B^2 \log(a + bx) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{8741816(bc - ad)^3g} - \frac{Bn \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{17483632(bc - ad)g(c + dx)^2} - \frac{3bBn \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8741816(bc - ad)^2g} \\
&= -\frac{b^2B^2 \log\left(-\frac{bc-ad}{d(a+bx)}\right) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{8741816(bc - ad)^3g} - \frac{b^2B^2 \log(a + bx) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{8741816(bc - ad)^3g} - \frac{Bn \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{17483632(bc - ad)g(c + dx)^2} \\
&= \frac{B^2n^2}{34967264(bc - ad)g(c + dx)^2} + \frac{7bB^2n^2}{17483632(bc - ad)^2g(c + dx)} + \frac{7b^2B^2n^2 \log(a + bx)}{17483632(bc - ad)^3g} \\
&= \frac{B^2n^2}{34967264(bc - ad)g(c + dx)^2} + \frac{7bB^2n^2}{17483632(bc - ad)^2g(c + dx)} + \frac{7b^2B^2n^2 \log(a + bx)}{17483632(bc - ad)^3g}
\end{aligned}$$

**Mathematica [B]** time = 1.3402, size = 971, normalized size = 2.42

$$4b^2B^2n^2 \log^3\left(\frac{a+bx}{c+dx}\right) - \frac{6Bn\left(-2Ac^2b^2-2Ad^2x^2b^2+3Bd^2nx^2b^2-4Acdbx^2+4Bcdnxb^2-2B(c+dx)^2 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)b^2+2Bn(c+dx)^2 \log\left(\frac{a+bx}{c+dx}\right)b^2+4aBcdnb+2\right)}{(c+dx)^2}$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2/((a\*g + b\*g\*x)\*(c\*i + d\*i\*x)^3), x]

[Out] (4\*b^2\*B^2\*n^2\*Log[(a + b\*x)/(c + d\*x)]^3 - (6\*B\*n\*Log[(a + b\*x)/(c + d\*x)]^2\*(-2\*A\*b^2\*c^2 + 4\*a\*b\*B\*c\*d\*n - a^2\*B\*d^2\*n - 4\*A\*b^2\*c\*d\*x + 4\*b^2\*B\*c\*d\*n\*x + 2\*a\*b\*B\*d^2\*n\*x - 2\*A\*b^2\*d^2\*x^2 + 3\*b^2\*B\*d^2\*n\*x^2 - 2\*b^2\*B\*(c + d\*x)^2\*Log[e\*((a + b\*x)/(c + d\*x))^n] + 2\*b^2\*B\*n\*(c + d\*x)^2\*Log[(a + b\*x)/(c + d\*x)]))/((c + d\*x)^2 - (6\*B\*(b\*c - a\*d)\*n\*Log[(a + b\*x)/(c + d\*x)]\*(-6\*A\*b\*c + 2\*a\*A\*d + 7\*b\*B\*c\*n - a\*B\*d\*n - 4\*A\*b\*d\*x + 6\*b\*B\*d\*n\*x + 2\*B\*(-3\*b\*c + a\*d - 2\*b\*d\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n] + 2\*B\*n\*(3\*b\*c - a\*d + 2\*b\*d\*x)\*Log[(a + b\*x)/(c + d\*x)]))/((c + d\*x)^2 + (3\*(b\*c - a\*d)^2\*(2\*A^2 - 2\*A\*B\*n + B^2\*n^2 + 2\*B^2\*Log[e\*((a + b\*x)/(c + d\*x))^n]^2 + 2\*B\*n\*(-2\*A + B\*n)\*Log[(a + b\*x)/(c + d\*x)] + 2\*B^2\*n^2\*Log[(a + b\*x)/(c + d\*x)]^2 - 2\*B\*Log[e\*((a + b\*x)/(c + d\*x))^n]\*(-2\*A + B\*n + 2\*B\*n\*Log[(a + b\*x)/(c + d\*x)])))/((c + d\*x)^2 + (6\*b\*(b\*c - a\*d)\*(2\*A^2 - 6\*A\*B\*n + 7\*B^2\*n^2 + 2\*B^2\*Log[e\*((a + b\*x)/(c + d\*x))^n]^2 + 2\*B\*n\*(-2\*A + 3\*B\*n)\*Log[(a + b\*x)/(c + d\*x)] + 2\*B^2\*n^2\*Log[(a + b\*x)/(c + d\*x)]^2 - 2\*B\*Log[e\*((a + b\*x)/(c + d\*x))^n]\*(-2\*A + 3\*B\*n + 2\*B\*n\*Log[(a + b\*x)/(c + d\*x)])))/((c + d\*x) + 6\*b^2\*Log[a + b\*x]\*(2\*A^2 - 6\*A\*B\*n + 7\*B^2\*n^2 + 2\*B^2\*Log[e\*((a + b\*x)/(c + d\*x))^n]^2 + 2\*B\*n\*(-2\*A + 3\*B\*n)\*Log[(a + b\*x)/(c + d\*x)] + 2\*B^2\*n^2\*Log[(a + b\*x)/(c + d\*x)]^2 - 2\*B\*Log[e\*((a + b\*x)/(c + d\*x))^n]\*(-2\*A + 3\*B\*n + 2\*B\*n\*Log[(a + b\*x)/(c + d\*x)])) - 6\*b^2\*(2\*A^2 - 6\*A\*B\*n + 7\*B^2\*n^2 + 2\*B^2\*Log[e\*((a + b\*x)/(c + d\*x))^n]^2 + 2\*B\*n\*(-2\*A + 3\*B\*n)\*Log[(a + b\*x)/(c + d\*x)] + 2\*B^2\*n^2\*Log[(a + b\*x)/(c + d\*x)]^2 - 2\*B\*Log[e\*((a + b\*x)/(c + d\*x))^n]\*(-2\*A + 3\*B\*n + 2\*B\*n\*Log[(a + b\*x)/(c + d\*x)]))\*Log[c + d\*x]/(12\*(b\*c - a\*d)^3\*g\*i^3)

**Maple [F]** time = 0.693, size = 0, normalized size = 0.

$$\int \frac{1}{(bgx + ag)(dix + ci)^3} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i)^3,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i)^3,x)
```

**Maxima [B]** time = 2.02039, size = 2870, normalized size = 7.14

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i)^3,x, a
lgorithm="maxima")
```

```
[Out] 1/2*B^2*((2*b*d*x + 3*b*c - a*d)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*g*i
^3*x^2 + 2*(b^2*c^3*d - 2*a*b*c^2*d^2 + a^2*c*d^3)*g*i^3*x + (b^2*c^4 - 2*a
*b*c^3*d + a^2*c^2*d^2)*g*i^3) + 2*b^2*log(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2
*d + 3*a^2*b*c*d^2 - a^3*d^3)*g*i^3) - 2*b^2*log(d*x + c)/((b^3*c^3 - 3*a*b
^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g*i^3))*log(e*(b*x/(d*x + c) + a/(d*x +
c))^n)^2 + A*B*((2*b*d*x + 3*b*c - a*d)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*
d^4)*g*i^3*x^2 + 2*(b^2*c^3*d - 2*a*b*c^2*d^2 + a^2*c*d^3)*g*i^3*x + (b^2*c
^4 - 2*a*b*c^3*d + a^2*c^2*d^2)*g*i^3) + 2*b^2*log(b*x + a)/((b^3*c^3 - 3*a
*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g*i^3) - 2*b^2*log(d*x + c)/((b^3*c^3
- 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g*i^3))*log(e*(b*x/(d*x + c) +
a/(d*x + c))^n) + 1/12*((45*b^2*c^2 - 48*a*b*c*d + 3*a^2*d^2 + 4*(b^2*d^2*x
^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x + a)^3 - 4*(b^2*d^2*x^2 + 2*b^2*c*d*x +
b^2*c^2)*log(d*x + c)^3 + 18*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x
+ a)^2 + 6*(3*b^2*d^2*x^2 + 6*b^2*c*d*x + 3*b^2*c^2 + 2*(b^2*d^2*x^2 + 2*b
^2*c*d*x + b^2*c^2)*log(b*x + a))*log(d*x + c)^2 + 42*(b^2*c*d - a*b*d^2)*x
+ 42*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x + a) - 6*(7*b^2*d^2*x^2
+ 14*b^2*c*d*x + 7*b^2*c^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b
*x + a)^2 + 6*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x + a))*log(d*x +
c))*n^2/(b^3*c^5*g*i^3 - 3*a*b^2*c^4*d*g*i^3 + 3*a^2*b*c^3*d^2*g*i^3 - a^3
*c^2*d^3*g*i^3 + (b^3*c^3*d^2*g*i^3 - 3*a*b^2*c^2*d^3*g*i^3 + 3*a^2*b*c*d^4
*g*i^3 - a^3*d^5*g*i^3)*x^2 + 2*(b^3*c^4*d*g*i^3 - 3*a*b^2*c^3*d^2*g*i^3 +
3*a^2*b*c^2*d^3*g*i^3 - a^3*c*d^4*g*i^3)*x) - 6*(7*b^2*c^2 - 8*a*b*c*d + a^
2*d^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x + a)^2 + 2*(b^2*d^2
*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(d*x + c)^2 + 6*(b^2*c*d - a*b*d^2)*x + 6*
(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x + a) - 2*(3*b^2*d^2*x^2 + 6*b
^2*c*d*x + 3*b^2*c^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x + a)
)*log(d*x + c))*n*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^3*c^5*g*i^3 - 3
*a*b^2*c^4*d*g*i^3 + 3*a^2*b*c^3*d^2*g*i^3 - a^3*c^2*d^3*g*i^3 + (b^3*c^3*d
^2*g*i^3 - 3*a*b^2*c^2*d^3*g*i^3 + 3*a^2*b*c*d^4*g*i^3 - a^3*d^5*g*i^3)*x^2
```

$$\begin{aligned}
& + 2*(b^3*c^4*d*g*i^3 - 3*a*b^2*c^3*d^2*g*i^3 + 3*a^2*b*c^2*d^3*g*i^3 - a^3*c*d^4*g*i^3)*x)) * B^2 - 1/2*(7*b^2*c^2 - 8*a*b*c*d + a^2*d^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*\log(b*x + a)^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*\log(d*x + c)^2 + 6*(b^2*c*d - a*b*d^2)*x + 6*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*\log(b*x + a) - 2*(3*b^2*d^2*x^2 + 6*b^2*c*d*x + 3*b^2*c^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*\log(b*x + a))*\log(d*x + c))*A*B*n / (b^3*c^5*g*i^3 - 3*a*b^2*c^4*d*g*i^3 + 3*a^2*b*c^3*d^2*g*i^3 - a^3*c^2*d^3*g*i^3 + (b^3*c^3*d^2*g*i^3 - 3*a*b^2*c^2*d^3*g*i^3 + 3*a^2*b*c*d^4*g*i^3 - a^3*d^5*g*i^3)*x^2 + 2*(b^3*c^4*d*g*i^3 - 3*a*b^2*c^3*d^2*g*i^3 + 3*a^2*b*c^2*d^3*g*i^3 - a^3*c*d^4*g*i^3)*x) + 1/2*A^2*((2*b*d*x + 3*b*c - a*d)/((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*g*i^3*x^2 + 2*(b^2*c^3*d - 2*a*b*c^2*d^2 + a^2*c*d^3)*g*i^3*x + (b^2*c^4 - 2*a*b*c^3*d + a^2*c^2*d^2)*g*i^3) + 2*b^2*log(b*x + a)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g*i^3) - 2*b^2*log(d*x + c)/((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*g*i^3))
\end{aligned}$$

**Fricas [B]** time = 0.577054, size = 2228, normalized size = 5.54

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)/(d*i*x+c*i)^3,x, a
algorithm="fricas")
```

```
[Out] 1/12*(18*A^2*b^2*c^2 - 24*A^2*a*b*c*d + 6*A^2*a^2*d^2 + 4*(B^2*b^2*d^2*n^2*x^2 + 2*B^2*b^2*c*d*n^2*x + B^2*b^2*c^2*n^2)*log((b*x + a)/(d*x + c))^3 + 3*(15*B^2*b^2*c^2 - 16*B^2*a*b*c*d + B^2*a^2*d^2)*n^2 + 6*(3*B^2*b^2*c^2 - 4*B^2*a*b*c*d + B^2*a^2*d^2 + 2*(B^2*b^2*c*d - B^2*a*b*d^2)*x + 2*(B^2*b^2*d^2*x^2 + 2*B^2*b^2*c*d*x + B^2*b^2*c^2)*log((b*x + a)/(d*x + c)))*log(e)^2 + 6*(2*A*B*b^2*c^2*n - (4*B^2*a*b*c*d - B^2*a^2*d^2)*n^2 - (3*B^2*b^2*d^2*n^2 - 2*A*B*b^2*d^2*n)*x^2 + 2*(2*A*B*b^2*c*d*n - (2*B^2*b^2*c*d + B^2*a*b*d^2)*n^2)*x)*log((b*x + a)/(d*x + c))^2 - 6*(7*A*B*b^2*c^2 - 8*A*B*a*b*c*d + A*B*a^2*d^2)*n + 6*(2*A^2*b^2*c*d - 2*A^2*a*b*d^2 + 7*(B^2*b^2*c*d - B^2*a*b*d^2)*n^2 - 6*(A*B*b^2*c*d - A*B*a*b*d^2)*n)*x + 6*(6*A*B*b^2*c^2 - 8*A*B*a*b*c*d + 2*A*B*a^2*d^2 + 2*(B^2*b^2*d^2*n*x^2 + 2*B^2*b^2*c*d*n*x + B^2*b^2*c^2*n)*log((b*x + a)/(d*x + c))^2 - (7*B^2*b^2*c^2 - 8*B^2*a*b*c*d + B^2*a^2*d^2)*n + 2*(2*A*B*b^2*c*d - 2*A*B*a*b*d^2 - 3*(B^2*b^2*c*d - B^2*a*b*d^2)*n)*x + 2*(2*A*B*b^2*c^2 - (3*B^2*b^2*d^2*n - 2*A*B*b^2*d^2)*x^2 - (4*B^2*a*b*c*d - B^2*a^2*d^2)*n + 2*(2*A*B*b^2*c*d - (2*B^2*b^2*c*d + B^2*a*b*d^2)*n)*x)*log((b*x + a)/(d*x + c))*log(e) + 6*(2*A^2*b^2*c^2 + (8*B^2*a*b*c*d - B^2*a^2*d^2)*n^2 + (7*B^2*b^2*d^2*n^2 - 6*A*B*b^2*d^2*n + 2*A^2*b^2*d^2
```

$2)*x^2 - 2*(4*A*B*a*b*c*d - A*B*a^2*d^2)*n + 2*(2*A^2*b^2*c*d + (4*B^2*b^2*c*d + 3*B^2*a*b*d^2)*n^2 - 2*(2*A*B*b^2*c*d + A*B*a*b*d^2)*n)*x)*\log((b*x + a)/(d*x + c)))/((b^3*c^3*d^2 - 3*a*b^2*c^2*d^3 + 3*a^2*b*c*d^4 - a^3*d^5)*g*i^3*x^2 + 2*(b^3*c^4*d - 3*a*b^2*c^3*d^2 + 3*a^2*b*c^2*d^3 - a^3*c*d^4)*g*i^3*x + (b^3*c^5 - 3*a*b^2*c^4*d + 3*a^2*b*c^3*d^2 - a^3*c^2*d^3)*g*i^3)$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*((b\*x+a)/(d\*x+c)))\*\*n))\*\*2/(b\*g\*x+a\*g)/(d\*i\*x+c\*i)\*\*3,x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}{(bgx+ag)(dix+ci)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c)))^n))^2/(b\*g\*x+a\*g)/(d\*i\*x+c\*i)^3,x, algorithm="giac")

[Out] integrate((B\*log(e\*((b\*x + a)/(d\*x + c)))^n) + A)^2/((b\*g\*x + a\*g)\*(d\*i\*x + c\*i)^3), x)

$$3.207 \quad \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^2(ci+dix)^3} dx$$

**Optimal.** Leaf size=562

$$\frac{b^3(c+dx)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)^2}{g^2i^3(a+bx)(bc-ad)^4} - \frac{2b^3Bn(c+dx)\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{g^2i^3(a+bx)(bc-ad)^4} - \frac{b^2d\left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)^3}{Bg^2i^3n(bc-ad)^4} + \frac{3bd^2}{g^2i^3(a+bx)(bc-ad)^4}$$

[Out]  $-(B^2d^3n^2(a+bx)^2)/(4*(b*c-a*d)^4g^2i^3(c+dx)^2) - (6*A*b*B*d^2n*(a+bx))/((b*c-a*d)^4g^2i^3(c+dx)) + (6*b*B^2d^2n^2*(a+bx))/((b*c-a*d)^4g^2i^3(c+dx)) - (2*b^3*B^2n^2*(c+dx))/((b*c-a*d)^4g^2i^3(a+bx)) - (6*b*B^2d^2n*(a+bx)*\text{Log}[e*((a+bx)/(c+dx))^n])/((b*c-a*d)^4g^2i^3(c+dx)) + (B*d^3n*(a+bx)^2*(A+B*\text{Log}[e*((a+bx)/(c+dx))^n]))/(2*(b*c-a*d)^4g^2i^3(c+dx)^2) - (2*b^3*B*n*(c+dx)*(A+B*\text{Log}[e*((a+bx)/(c+dx))^n]))/((b*c-a*d)^4g^2i^3(a+bx)) - (d^3*(a+bx)^2*(A+B*\text{Log}[e*((a+bx)/(c+dx))^n])^2)/(2*(b*c-a*d)^4g^2i^3(c+dx)^2) + (3*b*d^2*(a+bx)*(A+B*\text{Log}[e*((a+bx)/(c+dx))^n])^2)/((b*c-a*d)^4g^2i^3(c+dx)) - (b^3*(c+dx)*(A+B*\text{Log}[e*((a+bx)/(c+dx))^n])^2)/((b*c-a*d)^4g^2i^3(a+bx)) - (b^2*d*(A+B*\text{Log}[e*((a+bx)/(c+dx))^n])^3)/(B*(b*c-a*d)^4g^2i^3n)$

**Rubi [C]** time = 8.13443, antiderivative size = 2207, normalized size of antiderivative = 3.93, number of steps used = 135, number of rules used = 31, integrand size = 45,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.689$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2/((a\*g + b\*g\*x)^2\*(c\*i + d\*i\*x)^3), x]

[Out]  $(-2*b^2*B^2n^2)/((b*c-a*d)^3g^2i^3(a+bx)) - (B^2d^n^2)/(4*(b*c-a*d)^2g^2i^3(c+dx)^2) - (11*b*B^2d^n^2)/(2*(b*c-a*d)^3g^2i^3(c+dx)) - (15*b^2*B^2d^n^2*\text{Log}[a+bx])/((2*(b*c-a*d)^4g^2i^3) + (3*A*b^2*B*d*n*\text{Log}[a+bx]^2)/((b*c-a*d)^4g^2i^3) - (3*b^2*B^2d^n^2*\text{Log}[a$

$$\begin{aligned}
& + b*x]^2)/(2*(b*c - a*d)^4*g^2*i^3) + (3*b^2*B^2*d*Log[-((b*c - a*d)/(d*(a \\
& + b*x)))]*Log[e*((a + b*x)/(c + d*x))^n]^2)/((b*c - a*d)^4*g^2*i^3) + (3*b^ \\
& 2*B^2*d*Log[a + b*x]*Log[e*((a + b*x)/(c + d*x))^n]^2)/((b*c - a*d)^4*g^2*i \\
& ^3) - (2*b^2*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^3*g^2 \\
& *i^3*(a + b*x)) + (B*d*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - \\
& a*d)^2*g^2*i^3*(c + d*x)^2) + (5*b*B*d*n*(A + B*Log[e*((a + b*x)/(c + d*x)) \\
& ^n]))/((b*c - a*d)^3*g^2*i^3*(c + d*x)) + (3*b^2*B*d*n*Log[a + b*x]*(A + B* \\
& Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^4*g^2*i^3) - (b^2*(A + B*Log[ \\
& e*((a + b*x)/(c + d*x))^n]^2)/((b*c - a*d)^3*g^2*i^3*(a + b*x)) - (d*(A + \\
& B*Log[e*((a + b*x)/(c + d*x))^n]^2)/(2*(b*c - a*d)^2*g^2*i^3*(c + d*x)^2) \\
& - (2*b*d*(A + B*Log[e*((a + b*x)/(c + d*x))^n]^2)/((b*c - a*d)^3*g^2*i^3*( \\
& c + d*x)) - (3*b^2*d*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]^2) \\
& /((b*c - a*d)^4*g^2*i^3) + (15*b^2*B^2*d*n^2*Log[c + d*x])/(2*(b*c - a*d)^4 \\
& *g^2*i^3) - (6*A*b^2*B*d*n*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/ \\
& ((b*c - a*d)^4*g^2*i^3) + (3*b^2*B^2*d*n^2*Log[-((d*(a + b*x))/(b*c - a*d)) \\
& ]*Log[c + d*x])/((b*c - a*d)^4*g^2*i^3) - (3*b^2*B^2*d*Log[(a + b*x)^n]^2*L \\
& og[c + d*x])/((b*c - a*d)^4*g^2*i^3) - (3*b^2*B*d*n*(A + B*Log[e*((a + b*x) \\
& /((c + d*x))^n])*Log[c + d*x])/((b*c - a*d)^4*g^2*i^3) + (3*b^2*d*(A + B*Log \\
& [e*((a + b*x)/(c + d*x))^n]^2*Log[c + d*x])/((b*c - a*d)^4*g^2*i^3) + (3*A \\
& *b^2*B*d*n*Log[c + d*x]^2)/((b*c - a*d)^4*g^2*i^3) - (3*b^2*B^2*d*n^2*Log[c \\
& + d*x]^2)/(2*(b*c - a*d)^4*g^2*i^3) - (3*b^2*B^2*d*n^2*Log[a + b*x]*Log[c \\
& + d*x]^2)/((b*c - a*d)^4*g^2*i^3) + (3*b^2*B^2*d*n*Log[e*((a + b*x)/(c + d \\
& x))^n]*Log[c + d*x]^2)/((b*c - a*d)^4*g^2*i^3) + (b^2*B^2*d*n^2*Log[c + d*x \\
& ]^3)/((b*c - a*d)^4*g^2*i^3) - (6*A*b^2*B*d*n*Log[a + b*x]*Log[(b*(c + d*x) \\
& )/(b*c - a*d)]/((b*c - a*d)^4*g^2*i^3) + (3*b^2*B^2*d*n^2*Log[a + b*x]*Log \\
& [(b*(c + d*x))/(b*c - a*d)]/((b*c - a*d)^4*g^2*i^3) + (3*b^2*B^2*d*Log[(a \\
& + b*x)^n]^2*Log[(b*(c + d*x))/(b*c - a*d)]/((b*c - a*d)^4*g^2*i^3) - (6*b^ \\
& 2*B^2*d*n*Log[a + b*x]*Log[c + d*x]*Log[(c + d*x)^(-n)]/((b*c - a*d)^4*g^2 \\
& *i^3) - (3*b^2*B^2*d*Log[a + b*x]*Log[(c + d*x)^(-n)]^2)/((b*c - a*d)^4*g^2 \\
& *i^3) + (3*b^2*B^2*d*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^(-n)]^ \\
& 2)/((b*c - a*d)^4*g^2*i^3) + (6*b^2*B^2*d*n*Log[-((d*(a + b*x))/(b*c - a*d) \\
& ])*Log[c + d*x]*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c \\
& + d*x)^(-n)]))/((b*c - a*d)^4*g^2*i^3) - (6*A*b^2*B*d*n*PolyLog[2, -((d*(a \\
& + b*x))/(b*c - a*d))]/((b*c - a*d)^4*g^2*i^3) + (3*b^2*B^2*d*n^2*PolyLog[ \\
& 2, -((d*(a + b*x))/(b*c - a*d))]/((b*c - a*d)^4*g^2*i^3) + (6*b^2*B^2*d*n* \\
& Log[(a + b*x)^n]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))]/((b*c - a*d)^4*g \\
& ^2*i^3) - (6*A*b^2*B*d*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]/((b*c - a*d) \\
& ^4*g^2*i^3) + (3*b^2*B^2*d*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]/((b* \\
& c - a*d)^4*g^2*i^3) - (6*b^2*B^2*d*n*Log[(c + d*x)^(-n)]*PolyLog[2, (b*(c + \\
& d*x))/(b*c - a*d)]/((b*c - a*d)^4*g^2*i^3) + (6*b^2*B^2*d*n*(Log[(a + b*x) \\
& ^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)])*PolyLog[2, (b* \\
& (c + d*x))/(b*c - a*d)]/((b*c - a*d)^4*g^2*i^3) - (6*b^2*B^2*d*n*Log[e*((a \\
& + b*x)/(c + d*x))^n]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))]/((b*c - a* \\
& d)^4*g^2*i^3) - (6*b^2*B^2*d*n^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))]/ \\
& ((b*c - a*d)^4*g^2*i^3) - (6*b^2*B^2*d*n^2*PolyLog[3, (b*(c + d*x))/(b*c -
\end{aligned}$$



$$\frac{a*d]}{((b*c - a*d)^4*g^2*i^3) - (6*b^2*B^2*d*n^2*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x)])/(b*c - a*d)^4*g^2*i^3)}$$

### Rule 2528

`Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]`

### Rule 2525

`Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]`

### Rule 12

`Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_) /; FreeQ[b, x]]`

### Rule 44

`Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])`

### Rule 2524

`Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] := Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]`

### Rule 2418

`Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]`

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] := Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] := Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x
), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] := Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] := Dist[1/e, Subst[Int
```

```

[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]

```

### Rule 2344

```

Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
x_Symbol] := Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]

```

### Rule 2317

```

Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] := Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]

```

### Rule 2507

```

Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_))^(t_.))^(u_.)]*(v_), x_S
ymbol] := With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g +
h*x)^t)^u]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s + 1))/(p*r*(s + 1)*(b*c
- a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a +
b*x)^p*(c + d*x)^q]^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x] /; FreeQ[{
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
EqQ[p + q, 0] && NeQ[s, -1]

```

### Rule 2488

```

Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] := -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q]^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]

```

### Rule 2506

```

Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_
))^(q_.)]^(r_.)]^(s_.)*(u_), x_Symbol] := With[{g = Simplify[(v - 1)*(c + d
*x)/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/(b*c - a*d), x] + Dist[h*p*r

```

\*s, Int[(PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1))/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]

### Rule 6610

Int[(u\_)\*PolyLog[n\_, v\_], x\_Symbol] := With[{w = DerivativeDivides[v, u\*v, x]}, Simp[w\*PolyLog[n + 1, v], x] /; !FalseQ[w]] /; FreeQ[n, x]

### Rule 2500

Int[(Log[(e\_)\*((f\_)\*((a\_) + (b\_)\*(x\_))^(p\_))\*((c\_) + (d\_)\*(x\_))^(q\_))]^(r\_)]\*((s\_) + Log[(i\_)\*((g\_) + (h\_)\*(x\_))^(n\_)]\*(t\_)))/((j\_) + (k\_)\*(x\_)), x\_Symbol] := Dist[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r] - Log[(a + b\*x)^(p\*r)] - Log[(c + d\*x)^(q\*r)], Int[(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x], x] + (Int[(Log[(a + b\*x)^(p\*r)]\*(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x] + Int[(Log[(c + d\*x)^(q\*r)]\*(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0]

### Rule 2433

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_))^(n\_)]\*(b\_))]^(p\_)\*((f\_) + Log[(h\_)\*((i\_) + (j\_)\*(x\_))^(m\_)]\*(g\_))\*((k\_) + (l\_)\*(x\_))^(r\_), x\_Symbol] := Dist[1/e, Subst[Int[((k\*x)/d)^r\*(a + b\*Log[c\*x^n])^p\*(f + g\*Log[h\*(e\*i - d\*j)/e + (j\*x)/e]^m)], x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e\*k - d\*l, 0]

### Rule 2375

Int[(Log[(d\_)\*((e\_) + (f\_)\*(x\_))^(m\_))]^(r\_)]\*((a\_) + Log[(c\_)\*(x\_))^(n\_)]\*(b\_))]^(p\_))/(x\_), x\_Symbol] := Simp[(Log[d\*(e + f\*x^m)^r]\*(a + b\*Log[c\*x^n])^(p + 1))/(b\*n\*(p + 1)), x] - Dist[(f\*m\*r)/(b\*n\*(p + 1)), Int[(x^(m - 1)\*(a + b\*Log[c\*x^n])^(p + 1))/(e + f\*x^m), x], x] /; FreeQ[{a, b, c, d, e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d\*e, 1]

### Rule 2374

Int[(Log[(d\_)\*((e\_) + (f\_)\*(x\_))^(m\_))]\*(a\_) + Log[(c\_)\*(x\_))^(n\_)]\*(b\_))]^(p\_))/(x\_), x\_Symbol] := -Simp[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^p)/m, x] + Dist[(b\*n\*p)/m, Int[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0] && EqQ[d\*e, 1]

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_Symbol]
:> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d, e, n, p}, x]
&& EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol]
:> Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n)]*(f +
g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, m, n}, x]
&& IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol]
:> Simp[Log[x]*(a + b*Log[c*(d + e*x)^n)]*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Log[x]
*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x]
*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, m, n}, x]
&& EqQ[e*i - d*j, 0]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.)
+ (k_.)*(x_)), x_Symbol]
:> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r)/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dist[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x]
&& NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.)
*(x_)), x_Symbol]
:> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p}, x]
&& NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_))^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol]
:> Dist[1/(
```

$b \cdot n$ ),  $\text{Subst}[\text{Int}[x^p, x], x, a + b \cdot \text{Log}[c \cdot x^n]]$ ,  $x] /;$   $\text{FreeQ}\{a, b, c, n, p\}$ ,  
 $x]$

### Rule 30

$\text{Int}[(x_)^{(m_.)}, x\_Symbol] :> \text{Simp}[x^{(m + 1)}/(m + 1), x] /;$   $\text{FreeQ}[m, x] \ \&\& \ \text{NeQ}[m, -1]$

### Rubi steps

$$\begin{aligned}
\int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(207c + 207dx)^3(ag + bgx)^2} dx &= \int \left( \frac{b^3 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8869743(bc - ad)^3g^2(a + bx)^2} - \frac{b^3d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2956581(bc - ad)^4g^2(a + bx)} + \frac{d^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8869743(bc - ad)^3g^2(c + dx)^2} \right) dx \\
&= -\frac{(b^3d) \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx} dx}{2956581(bc - ad)^4g^2} + \frac{(b^2d^2) \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx} dx}{2956581(bc - ad)^4g^2} + \frac{b^3 \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(a+bx)^2} dx}{8869743(bc - ad)^3g^2} \\
&= -\frac{b^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8869743(bc - ad)^3g^2(a + bx)} - \frac{d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17739486(bc - ad)^2g^2(c + dx)^2} - \frac{2bd \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8869743(bc - ad)^3g^2(a + bx)} \\
&= -\frac{b^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8869743(bc - ad)^3g^2(a + bx)} - \frac{d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17739486(bc - ad)^2g^2(c + dx)^2} - \frac{2bd \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8869743(bc - ad)^3g^2(a + bx)} \\
&= -\frac{b^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8869743(bc - ad)^3g^2(a + bx)} - \frac{d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17739486(bc - ad)^2g^2(c + dx)^2} - \frac{2bd \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8869743(bc - ad)^3g^2(a + bx)} \\
&= -\frac{b^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8869743(bc - ad)^3g^2(a + bx)} - \frac{d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17739486(bc - ad)^2g^2(c + dx)^2} - \frac{2bd \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8869743(bc - ad)^3g^2(a + bx)} \\
&= -\frac{2b^2Bn \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8869743(bc - ad)^3g^2(a + bx)} + \frac{Bdn \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{17739486(bc - ad)^2g^2(c + dx)^2} + \frac{5bBdn \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8869743(bc - ad)^3g^2(a + bx)} \\
&= \frac{b^2B^2d \log(a + bx) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{2956581(bc - ad)^4g^2} - \frac{2b^2Bn \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8869743(bc - ad)^3g^2(a + bx)} + \frac{Bdn \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{17739486(bc - ad)^2g^2(c + dx)^2} \\
&= \frac{b^2B^2d \log\left(-\frac{bc-ad}{d(a+bx)}\right) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{2956581(bc - ad)^4g^2} + \frac{b^2B^2d \log(a + bx) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{2956581(bc - ad)^4g^2} - \frac{2b^2Bn \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8869743(bc - ad)^3g^2(a + bx)} \\
&= -\frac{2b^2B^2n^2}{8869743(bc - ad)^3g^2(a + bx)} - \frac{B^2dn^2}{35478972(bc - ad)^2g^2(c + dx)^2} - \frac{11b^2Bn \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{17739486(bc - ad)^2g^2(c + dx)^2} \\
&= -\frac{2b^2B^2n^2}{8869743(bc - ad)^3g^2(a + bx)} - \frac{B^2dn^2}{35478972(bc - ad)^2g^2(c + dx)^2} - \frac{11b^2Bn \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{17739486(bc - ad)^2g^2(c + dx)^2}
\end{aligned}$$

**Mathematica [B]** time = 2.12528, size = 1334, normalized size = 2.37

$$4b^2B^2dn^2(a+bx)(c+dx)^2\log^3\left(\frac{a+bx}{c+dx}\right)+2Bn\left(6Ad^3x^3b^3-3Bd^3nx^3b^3+12Acd^2x^2b^3+2Bc^3nb^3+6Ac^2dxb^3+6Bc^2dn\right)$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2/((a\*g + b\*g\*x)^2\*(c\*i + d\*i\*x)^3), x]

[Out] 
$$\begin{aligned} & -(4*b^2*B^2*d*n^2*(a + b*x)*(c + d*x)^2*\text{Log}[(a + b*x)/(c + d*x)]^3 + 2*B*n* \\ & \text{Log}[(a + b*x)/(c + d*x)]^2*(6*a*A*b^2*c^2*d + 2*b^3*B*c^3*n - 6*a^2*b*B*c*d \\ & ^2*n + a^3*B*d^3*n + 6*A*b^3*c^2*d*x + 12*a*A*b^2*c*d^2*x + 6*b^3*B*c^2*d*n \\ & *x - 12*a*b^2*B*c*d^2*n*x - 3*a^2*b*B*d^3*n*x + 12*A*b^3*c*d^2*x^2 + 6*a*A* \\ & b^2*d^3*x^2 - 9*a*b^2*B*d^3*n*x^2 + 6*A*b^3*d^3*x^3 - 3*b^3*B*d^3*n*x^3 + 6 \\ & *b^2*B*d*(a + b*x)*(c + d*x)^2*\text{Log}[e*((a + b*x)/(c + d*x))^n] - 6*b^2*B*d*n \\ & *(a + b*x)*(c + d*x)^2*\text{Log}[(a + b*x)/(c + d*x)]) + 4*b^2*(b*c - a*d)*(c + d \\ & *x)^2*(A^2 + 2*A*B*n + 2*B^2*n^2 + B^2*\text{Log}[e*((a + b*x)/(c + d*x))^n]^2 - 2 \\ & *B*n*(A + B*n)*\text{Log}[(a + b*x)/(c + d*x)] + B^2*n^2*\text{Log}[(a + b*x)/(c + d*x)]^2 \\ & + 2*B*\text{Log}[e*((a + b*x)/(c + d*x))^n]*(A + B*n - B*n*\text{Log}[(a + b*x)/(c + d* \\ & x)])) + 2*B*(b*c - a*d)*n*\text{Log}[(a + b*x)/(c + d*x)]*(2*b*d*(a + b*x)*(c + d \\ & x)*(4*A - 5*B*n + 4*B*\text{Log}[e*((a + b*x)/(c + d*x))^n] - 4*B*n*\text{Log}[(a + b*x)/ \\ & (c + d*x)]) + d*(b*c - a*d)*(a + b*x)*(2*A - B*n + 2*B*\text{Log}[e*((a + b*x)/(c \\ & + d*x))^n] - 2*B*n*\text{Log}[(a + b*x)/(c + d*x)]) + 4*b^2*(c + d*x)^2*(A + B*n + \\ & B*\text{Log}[e*((a + b*x)/(c + d*x))^n] - B*n*\text{Log}[(a + b*x)/(c + d*x)]) + d*(b*c \\ & - a*d)^2*(a + b*x)*(2*A^2 - 2*A*B*n + B^2*n^2 + 2*B^2*\text{Log}[e*((a + b*x)/(c \\ & + d*x))^n]^2 + 2*B*n*(-2*A + B*n)*\text{Log}[(a + b*x)/(c + d*x)] + 2*B^2*n^2*\text{Log} \\ & [(a + b*x)/(c + d*x)]^2 - 2*B*\text{Log}[e*((a + b*x)/(c + d*x))^n]*(-2*A + B*n + 2 \\ & *B*n*\text{Log}[(a + b*x)/(c + d*x)])) + 6*b^2*d*(a + b*x)*(c + d*x)^2*\text{Log}[a + b*x \\ & ]*(2*A^2 - 2*A*B*n + 5*B^2*n^2 + 2*B^2*\text{Log}[e*((a + b*x)/(c + d*x))^n]^2 + 2 \\ & *B*n*(-2*A + B*n)*\text{Log}[(a + b*x)/(c + d*x)] + 2*B^2*n^2*\text{Log}[(a + b*x)/(c + d \\ & *x)]^2 - 2*B*\text{Log}[e*((a + b*x)/(c + d*x))^n]*(-2*A + B*n + 2*B*n*\text{Log}[(a + b* \\ & x)/(c + d*x)])) + 2*b*d*(b*c - a*d)*(a + b*x)*(c + d*x)*(4*A^2 - 10*A*B*n + \\ & 11*B^2*n^2 + 4*B^2*\text{Log}[e*((a + b*x)/(c + d*x))^n]^2 + 2*B*n*(-4*A + 5*B*n) \\ & *\text{Log}[(a + b*x)/(c + d*x)] + 4*B^2*n^2*\text{Log}[(a + b*x)/(c + d*x)]^2 - 2*B*\text{Log} \\ & [e*((a + b*x)/(c + d*x))^n]*(-4*A + 5*B*n + 4*B*n*\text{Log}[(a + b*x)/(c + d*x)])) \\ & - 6*b^2*d*(a + b*x)*(c + d*x)^2*(2*A^2 - 2*A*B*n + 5*B^2*n^2 + 2*B^2*\text{Log}[e \\ & *((a + b*x)/(c + d*x))^n]^2 + 2*B*n*(-2*A + B*n)*\text{Log}[(a + b*x)/(c + d*x)] + \\ & 2*B^2*n^2*\text{Log}[(a + b*x)/(c + d*x)]^2 - 2*B*\text{Log}[e*((a + b*x)/(c + d*x))^n]* \\ & (-2*A + B*n + 2*B*n*\text{Log}[(a + b*x)/(c + d*x)])))*\text{Log}[c + d*x]/(4*(b*c - a*d) \\ & ^4*g^2*i^3*(a + b*x)*(c + d*x)^2) \end{aligned}$$



**Maple [F]** time = 0.698, size = 0, normalized size = 0.

$$\int \frac{1}{(bgx + ag)^2 (dix + ci)^3} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^2/(d\*i\*x+c\*i)^3,x)

[Out] int((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^2/(d\*i\*x+c\*i)^3,x)

**Maxima [B]** time = 2.9237, size = 5669, normalized size = 10.09

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^2/(d\*i\*x+c\*i)^3,x,  
algorithm="maxima")

[Out] 
$$\begin{aligned} & -1/2*B^2*((6*b^2*d^2*x^2 + 2*b^2*c^2 + 5*a*b*c*d - a^2*d^2 + 3*(3*b^2*c*d + a*b*d^2)*x)/((b^4*c^3*d^2 - 3*a*b^3*c^2*d^3 + 3*a^2*b^2*c*d^4 - a^3*b*d^5) \\ & *g^2*i^3*x^3 + (2*b^4*c^4*d - 5*a*b^3*c^3*d^2 + 3*a^2*b^2*c^2*d^3 + a^3*b*c*d^4 - a^4*d^5)*g^2*i^3*x^2 + (b^4*c^5 - a*b^3*c^4*d - 3*a^2*b^2*c^3*d^2 + \\ & 5*a^3*b*c^2*d^3 - 2*a^4*c*d^4)*g^2*i^3*x + (a*b^3*c^5 - 3*a^2*b^2*c^4*d + 3*a^3*b*c^3*d^2 - a^4*c^2*d^3)*g^2*i^3) + 6*b^2*d*log(b*x + a)/((b^4*c^4 - 4 \\ & *a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^2*i^3) - 6*b^2*d*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^2*i^3) \\ & ) * log(e*(b*x/(d*x + c) + a/(d*x + c))^n)^2 - A*B*((6*b^2*d^2*x^2 + 2*b^2*c^2 + 5*a*b*c*d - a^2*d^2 + 3*(3*b^2*c*d + a*b*d^2)*x) \\ & /((b^4*c^3*d^2 - 3*a*b^3*c^2*d^3 + 3*a^2*b^2*c*d^4 - a^3*b*d^5)*g^2*i^3*x^3 + (2*b^4*c^4*d - 5*a*b^3*c^3*d^2 + 3*a^2*b^2*c^2*d^3 + a^3*b*c*d^4 - a^4*d^5) \\ & *g^2*i^3*x^2 + (b^4*c^5 - a*b^3*c^4*d - 3*a^2*b^2*c^3*d^2 + 5*a^3*b*c^2*d^3 - 2*a^4*c*d^4)*g^2*i^3*x + (a*b^3*c^5 - 3*a^2*b^2*c^4*d + 3*a^3*b*c^3*d^2 - a^4*c^2*d^3) \\ & *g^2*i^3) + 6*b^2*d*log(b*x + a)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4)*g^2*i^3) - 6*b^2*d*log(d*x + c)/((b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + a^4*d^4) \\ & *g^2*i^3) * log(e*(b*x/(d*x + c) + a/(d*x + c))^n) - 1/4*((8*b^3*c^3 + 15*a*b^2*c^2*d - 24*a^2*b*c*d^2 + a^3*d^3 + 4*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x) * log(b*x + a)^3 \\ & - 4*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d \end{aligned}$$

$$\begin{aligned}
& + 2*a*b^2*c*d^2)*x)*\log(d*x + c)^3 + 30*(b^3*c*d^2 - a*b^2*d^3)*x^2 + 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*\log(b*x + a)^2 + 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x + 2*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*\log(b*x + a))*\log(d*x + c)^2 + 3*(13*b^3*c^2*d - 6*a*b^2*c*d^2 - 7*a^2*b*d^3)*x + 30*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*\log(b*x + a) - 6*(5*b^3*d^3*x^3 + 5*a*b^2*c^2*d + 5*(2*b^3*c*d^2 + a*b^2*d^3)*x^2 + 2*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*\log(b*x + a)^2 + 5*(b^3*c^2*d + 2*a*b^2*c*d^2)*x + 2*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*\log(b*x + a))*\log(d*x + c))*n^2/(a*b^4*c^6*g^2*i^3 - 4*a^2*b^3*c^5*d*g^2*i^3 + 6*a^3*b^2*c^4*d^2*g^2*i^3 - 4*a^4*b*c^3*d^3*g^2*i^3 + a^5*c^2*d^4*g^2*i^3 + (b^5*c^4*d^2*g^2*i^3 - 4*a*b^4*c^3*d^3*g^2*i^3 + 6*a^2*b^3*c^2*d^4*g^2*i^3 - 4*a^3*b^2*c*d^5*g^2*i^3 + a^4*b*d^6*g^2*i^3)*x^3 + (2*b^5*c^5*d*g^2*i^3 - 7*a*b^4*c^4*d^2*g^2*i^3 + 8*a^2*b^3*c^3*d^3*g^2*i^3 - 2*a^3*b^2*c^2*d^4*g^2*i^3 - 2*a^4*b*c*d^5*g^2*i^3 + a^5*d^6*g^2*i^3)*x^2 + (b^5*c^6*g^2*i^3 - 2*a*b^4*c^5*d*g^2*i^3 - 2*a^2*b^3*c^4*d^2*g^2*i^3 + 8*a^3*b^2*c^3*d^3*g^2*i^3 - 7*a^4*b*c^2*d^4*g^2*i^3 + 2*a^5*c*d^5*g^2*i^3)*x) + 2*(4*b^3*c^3 - 15*a*b^2*c^2*d + 12*a^2*b*c*d^2 - a^3*d^3 - 6*(b^3*c*d^2 - a*b^2*d^3)*x^2 - 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*\log(b*x + a)^2 - 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*\log(d*x + c)^2 - 3*(b^3*c^2*d + 2*a*b^2*c*d^2 - 3*a^2*b*d^3)*x - 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*\log(b*x + a) + 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x + 2*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*\log(b*x + a))*\log(d*x + c))*n*\log(e*(b*x/(d*x + c) + a/(d*x + c)))^n)/(a*b^4*c^6*g^2*i^3 - 4*a^2*b^3*c^5*d*g^2*i^3 + 6*a^3*b^2*c^4*d^2*g^2*i^3 - 4*a^4*b*c^3*d^3*g^2*i^3 + a^5*c^2*d^4*g^2*i^3 + (b^5*c^4*d^2*g^2*i^3 - 4*a*b^4*c^3*d^3*g^2*i^3 + 6*a^2*b^3*c^2*d^4*g^2*i^3 - 4*a^3*b^2*c*d^5*g^2*i^3 + a^4*b*d^6*g^2*i^3)*x^3 + (2*b^5*c^5*d*g^2*i^3 - 7*a*b^4*c^4*d^2*g^2*i^3 + 8*a^2*b^3*c^3*d^3*g^2*i^3 - 2*a^3*b^2*c^2*d^4*g^2*i^3 - 2*a^4*b*c*d^5*g^2*i^3 + a^5*d^6*g^2*i^3)*x^2 + (b^5*c^6*g^2*i^3 - 2*a*b^4*c^5*d*g^2*i^3 - 2*a^2*b^3*c^4*d^2*g^2*i^3 + 8*a^3*b^2*c^3*d^3*g^2*i^3 - 7*a^4*b*c^2*d^4*g^2*i^3 + 2*a^5*c*d^5*g^2*i^3)*x))*B^2 - 1/2*(4*b^3*c^3 - 15*a*b^2*c^2*d + 12*a^2*b*c*d^2 - a^3*d^3 - 6*(b^3*c*d^2 - a*b^2*d^3)*x^2 - 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*\log(b*x + a)^2 - 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*\log(d*x + c)^2 - 3*(b^3*c^2*d + 2*a*b^2*c*d^2 - 3*a^2*b*d^3)*x - 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x)*\log(b*x + a) + 6*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (b^3*c^2*d + 2*a*b^2*c*d^2)*x + 2*(b^3*d^3*x^3 + a*b^2*c^2*d + (2*b^3*c*d^2 + a*b^2*d^3)*x^2 + (
\end{aligned}$$

$$\begin{aligned}
& b^3c^2d + 2ab^2cd^2) * x) * \log(bx + a) * \log(dx + c) * A * B * n / (a^4c^6g^2i^3 - 4a^2b^3c^5d^2g^2i^3 + 6a^3b^2c^4d^2g^2i^3 - 4a^4b^2c^3d^3g^2i^3 + a^5c^2d^4g^2i^3 + (b^5c^4d^2g^2i^3 - 4a^4b^3c^3d^3g^2i^3 + 6a^2b^3c^2d^4g^2i^3 - 4a^3b^2c^2d^5g^2i^3 + a^4b^2d^6g^2i^3) * x^3 + (2b^5c^5d^2g^2i^3 - 7a^4b^4c^4d^2g^2i^3 + 8a^2b^3c^3d^3g^2i^3 - 2a^3b^2c^2d^4g^2i^3 - 2a^4b^2c^5g^2i^3 + a^5d^6g^2i^3) * x^2 + (b^5c^6g^2i^3 - 2a^4b^4c^5d^2g^2i^3 - 2a^2b^3c^4d^2g^2i^3 + 8a^3b^2c^3d^3g^2i^3 - 7a^4b^2c^2d^4g^2i^3 + 2a^5c^2d^5g^2i^3) * x) - 1/2 * A^2 * ((6b^2d^2x^2 + 2b^2c^2 + 5ab^2cd - a^2d^2 + 3(3b^2cd + ab^2d^2) * x) / ((b^4c^3d^2 - 3ab^3c^2d^3 + 3a^2b^2c^2d^4 - a^3b^2d^5) * g^2i^3 * x^3 + (2b^4c^4d - 5ab^3c^3d^2 + 3a^2b^2c^2d^3 + a^3b^2cd^4 - a^4d^5) * g^2i^3 * x^2 + (b^4c^5 - ab^3c^4d - 3a^2b^2c^3d^2 + 5a^3b^2cd^3 - 2a^4cd^4) * g^2i^3 * x + (ab^3c^5 - 3a^2b^2c^4d + 3a^3b^2cd^3 - a^4c^2d^3) * g^2i^3) + 6b^2d * \log(bx + a) / ((b^4c^4 - 4ab^3c^3d + 6a^2b^2c^2d^2 - 4a^3b^2cd^3 + a^4d^4) * g^2i^3) - 6b^2d * \log(dx + c) / ((b^4c^4 - 4ab^3c^3d + 6a^2b^2c^2d^2 - 4a^3b^2cd^3 + a^4d^4) * g^2i^3))
\end{aligned}$$

**Fricas [B]** time = 0.700824, size = 4177, normalized size = 7.43

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c)))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x,
algorithm="fricas")
```

```
[Out] -1/4*(4*A^2*b^3*c^3 + 6*A^2*a*b^2*c^2*d - 12*A^2*a^2*b*c*d^2 + 2*A^2*a^3*d^3 + 4*(B^2*b^3*d^3*n^2*x^3 + B^2*a*b^2*c^2*d*n^2 + (2*B^2*b^3*c*d^2 + B^2*a*b^2*d^3)*n^2*x^2 + (B^2*b^3*c^2*d + 2*B^2*a*b^2*c*d^2)*n^2*x)*log((b*x + a)/(d*x + c))^3 + (8*B^2*b^3*c^3 + 15*B^2*a*b^2*c^2*d - 24*B^2*a^2*b*c*d^2 + B^2*a^3*d^3)*n^2 + 6*(2*A^2*b^3*c*d^2 - 2*A^2*a*b^2*d^3 + 5*(B^2*b^3*c*d^2 - B^2*a*b^2*d^3)*n^2 - 2*(A*B*b^3*c*d^2 - A*B*a*b^2*d^3)*n)*x^2 + 2*(2*B^2*b^3*c^3 + 3*B^2*a*b^2*c^2*d - 6*B^2*a^2*b*c*d^2 + B^2*a^3*d^3 + 6*(B^2*b^3*c*d^2 - B^2*a*b^2*d^3)*x^2 + 3*(3*B^2*b^3*c^2*d - 2*B^2*a*b^2*c*d^2 - B^2*a^2*b*d^3)*x + 6*(B^2*b^3*d^3*x^3 + B^2*a*b^2*c^2*d + (2*B^2*b^3*c*d^2 + B^2*a*b^2*d^3)*x^2 + (B^2*b^3*c^2*d + 2*B^2*a*b^2*c*d^2)*x)*log((b*x + a)/(d*x + c))*log(e)^2 + 2*(6*A*B*a*b^2*c^2*d*n - 3*(B^2*b^3*d^3*n^2 - 2*A*B*b^3*d^3*n)*x^3 + (2*B^2*b^3*c^3 - 6*B^2*a^2*b*c*d^2 + B^2*a^3*d^3)*n^2 - 3*(3*B^2*a*b^2*d^3*n^2 - 2*(2*A*B*b^3*c*d^2 + A*B*a*b^2*d^3)*n)*x^2 + 3*((2*B^2*b^3*c^2*d - 4*B^2*a*b^2*c*d^2 - B^2*a^2*b*d^3)*n^2 + 2*(A*B*b^3*c^2*d + 2*A*B*a*b^2*c*d^2)*n)*x)*log((b*x + a)/(d*x + c))^2 + 2*(4*A*B*b^3*c^3 - 15*A*
```

$$\begin{aligned}
& B*a*b^2*c^2*d + 12*A*B*a^2*b*c*d^2 - A*B*a^3*d^3)*n + 3*(6*A^2*b^3*c^2*d - \\
& 4*A^2*a*b^2*c*d^2 - 2*A^2*a^2*b*d^3 + (13*B^2*b^3*c^2*d - 6*B^2*a*b^2*c*d^2 \\
& - 7*B^2*a^2*b*d^3)*n^2 - 2*(A*B*b^3*c^2*d + 2*A*B*a*b^2*c*d^2 - 3*A*B*a^2* \\
& b*d^3)*n)*x + 2*(4*A*B*b^3*c^3 + 6*A*B*a*b^2*c^2*d - 12*A*B*a^2*b*c*d^2 + 2 \\
& *A*B*a^3*d^3 + 6*(2*A*B*b^3*c*d^2 - 2*A*B*a*b^2*d^3 - (B^2*b^3*c*d^2 - B^2* \\
& a*b^2*d^3)*n)*x^2 + 6*(B^2*b^3*d^3*n*x^3 + B^2*a*b^2*c^2*d*n + (2*B^2*b^3*c \\
& *d^2 + B^2*a*b^2*d^3)*n*x^2 + (B^2*b^3*c^2*d + 2*B^2*a*b^2*c*d^2)*n*x)*log( \\
& (b*x + a)/(d*x + c))^2 + (4*B^2*b^3*c^3 - 15*B^2*a*b^2*c^2*d + 12*B^2*a^2*b \\
& *c*d^2 - B^2*a^3*d^3)*n + 3*(6*A*B*b^3*c^2*d - 4*A*B*a*b^2*c*d^2 - 2*A*B*a^ \\
& 2*b*d^3 - (B^2*b^3*c^2*d + 2*B^2*a*b^2*c*d^2 - 3*B^2*a^2*b*d^3)*n)*x + 2*(6 \\
& *A*B*a*b^2*c^2*d - 3*(B^2*b^3*d^3*n - 2*A*B*b^3*d^3)*x^3 - 3*(3*B^2*a*b^2*d \\
& ^3*n - 4*A*B*b^3*c*d^2 - 2*A*B*a*b^2*d^3)*x^2 + (2*B^2*b^3*c^3 - 6*B^2*a^2* \\
& b*c*d^2 + B^2*a^3*d^3)*n + 3*(2*A*B*b^3*c^2*d + 4*A*B*a*b^2*c*d^2 + (2*B^2* \\
& b^3*c^2*d - 4*B^2*a*b^2*c*d^2 - B^2*a^2*b*d^3)*n)*x)*log((b*x + a)/(d*x + c \\
& ))*log(e) + 2*(6*A^2*a*b^2*c^2*d + 3*(5*B^2*b^3*d^3*n^2 - 2*A*B*b^3*d^3*n \\
& + 2*A^2*b^3*d^3)*x^3 + (4*B^2*b^3*c^3 + 12*B^2*a^2*b*c*d^2 - B^2*a^3*d^3)*n \\
& ^2 - 3*(6*A*B*a*b^2*d^3*n - 4*A^2*b^3*c*d^2 - 2*A^2*a*b^2*d^3 - (8*B^2*b^3* \\
& c*d^2 + 7*B^2*a*b^2*d^3)*n^2)*x^2 + 2*(2*A*B*b^3*c^3 - 6*A*B*a^2*b*c*d^2 + \\
& A*B*a^3*d^3)*n + 3*(2*A^2*b^3*c^2*d + 4*A^2*a*b^2*c*d^2 + (4*B^2*b^3*c^2*d \\
& + 8*B^2*a*b^2*c*d^2 + 3*B^2*a^2*b*d^3)*n^2 + 2*(2*A*B*b^3*c^2*d - 4*A*B*a*b \\
& ^2*c*d^2 - A*B*a^2*b*d^3)*n)*x)*log((b*x + a)/(d*x + c))/((b^5*c^4*d^2 - 4 \\
& *a*b^4*c^3*d^3 + 6*a^2*b^3*c^2*d^4 - 4*a^3*b^2*c^3*d^5 + a^4*b*d^6)*g^2*i^3*x \\
& ^3 + (2*b^5*c^5*d - 7*a*b^4*c^4*d^2 + 8*a^2*b^3*c^3*d^3 - 2*a^3*b^2*c^2*d^4 \\
& - 2*a^4*b*c*d^5 + a^5*d^6)*g^2*i^3*x^2 + (b^5*c^6 - 2*a*b^4*c^5*d - 2*a^2* \\
& b^3*c^4*d^2 + 8*a^3*b^2*c^3*d^3 - 7*a^4*b*c^2*d^4 + 2*a^5*c*d^5)*g^2*i^3*x \\
& + (a*b^4*c^6 - 4*a^2*b^3*c^5*d + 6*a^3*b^2*c^4*d^2 - 4*a^4*b*c^3*d^3 + a^5* \\
& c^2*d^4)*g^2*i^3)
\end{aligned}$$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**2/(d*i*x+c*i)**3, x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2}{(bgx + ag)^2 (dix + ci)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2/(d*i*x+c*i)^3,x,
algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/((b*g*x + a*g)^2*(d*i*x
+ c*i)^3), x)
```

**3.208** 
$$\int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^3(ci+dix)^3} dx$$

**Optimal.** Leaf size=732

$$\frac{2b^2d^2 \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)^3}{Bg^3i^3n(bc-ad)^5} - \frac{b^4(c+dx)^2 \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)^2}{2g^3i^3(a+bx)^2(bc-ad)^5} - \frac{b^4Bn(c+dx)^2 \left(B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) + A\right)}{2g^3i^3(a+bx)^2(bc-ad)^5} + \frac{4b^3d}{\dots}$$

```
[Out] (B^2*d^4*n^2*(a + b*x)^2)/(4*(b*c - a*d)^5*g^3*i^3*(c + d*x)^2) + (8*A*b*B*d^3*n*(a + b*x))/((b*c - a*d)^5*g^3*i^3*(c + d*x)) - (8*b*B^2*d^3*n^2*(a + b*x))/((b*c - a*d)^5*g^3*i^3*(c + d*x)) + (8*b^3*B^2*d*n^2*(c + d*x))/((b*c - a*d)^5*g^3*i^3*(a + b*x)) - (b^4*B^2*n^2*(c + d*x)^2)/(4*(b*c - a*d)^5*g^3*i^3*(a + b*x)^2) + (8*b*B^2*d^3*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/((b*c - a*d)^5*g^3*i^3*(c + d*x)) - (B*d^4*n*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^5*g^3*i^3*(c + d*x)^2) + (8*b^3*B*d*n*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^5*g^3*i^3*(a + b*x)) - (b^4*B*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^5*g^3*i^3*(a + b*x)^2) + (d^4*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*(b*c - a*d)^5*g^3*i^3*(c + d*x)^2) - (4*b*d^3*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^5*g^3*i^3*(c + d*x)) + (4*b^3*d*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^5*g^3*i^3*(a + b*x)) - (b^4*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*(b*c - a*d)^5*g^3*i^3*(a + b*x)^2) + (2*b^2*d^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^3)/(B*(b*c - a*d)^5*g^3*i^3*n)
```

**Rubi [C]** time = 9.22738, antiderivative size = 2041, normalized size of antiderivative = 2.79, number of steps used = 163, number of rules used = 31, integrand size = 45,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.689$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^3*(c*i + d*i*x)^3), x]
```

```
[Out] -(b^2*B^2*n^2)/(4*(b*c - a*d)^3*g^3*i^3*(a + b*x)^2) + (15*b^2*B^2*d*n^2)/(2*(b*c - a*d)^4*g^3*i^3*(a + b*x)) + (B^2*d^2*n^2)/(4*(b*c - a*d)^3*g^3*i^3
```

$$\begin{aligned}
&*(c + d*x)^2) + (15*b*B^2*d^2*n^2)/((2*(b*c - a*d)^4*g^3*i^3*(c + d*x)) + (1 \\
&5*b^2*B^2*d^2*n^2*Log[a + b*x])/((b*c - a*d)^5*g^3*i^3) - (6*A*b^2*B*d^2*n* \\
&Log[a + b*x]^2)/((b*c - a*d)^5*g^3*i^3) - (6*b^2*B^2*d^2*Log[-((b*c - a*d)/ \\
&(d*(a + b*x))])*Log[e*((a + b*x)/(c + d*x))^n]^2)/((b*c - a*d)^5*g^3*i^3) - \\
&(6*b^2*B^2*d^2*Log[a + b*x]*Log[e*((a + b*x)/(c + d*x))^n]^2)/((b*c - a*d) \\
&^5*g^3*i^3) - (b^2*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a* \\
&d)^3*g^3*i^3*(a + b*x)^2) + (7*b^2*B*d*n*(A + B*Log[e*((a + b*x)/(c + d*x)) \\
&^n]))/((b*c - a*d)^4*g^3*i^3*(a + b*x)) - (B*d^2*n*(A + B*Log[e*((a + b*x)/ \\
&(c + d*x))^n]))/(2*(b*c - a*d)^3*g^3*i^3*(c + d*x)^2) - (7*b*B*d^2*n*(A + B \\
&*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^4*g^3*i^3*(c + d*x)) - (b^2* \\
&(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*(b*c - a*d)^3*g^3*i^3*(a + b*x) \\
&^2) + (3*b^2*d*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^4*g^ \\
&3*i^3*(a + b*x)) + (d^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*(b*c - \\
&a*d)^3*g^3*i^3*(c + d*x)^2) + (3*b*d^2*(A + B*Log[e*((a + b*x)/(c + d*x))^ \\
&n])^2)/((b*c - a*d)^4*g^3*i^3*(c + d*x)) + (6*b^2*d^2*Log[a + b*x]*(A + B*L \\
&og[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^5*g^3*i^3) - (15*b^2*B^2*d^2 \\
&*n^2*Log[c + d*x])/((b*c - a*d)^5*g^3*i^3) + (12*A*b^2*B*d^2*n*Log[-((d*(a \\
&+ b*x))/(b*c - a*d))]*Log[c + d*x])/((b*c - a*d)^5*g^3*i^3) + (6*b^2*B^2*d^ \\
&2*Log[(a + b*x)^n]^2*Log[c + d*x])/((b*c - a*d)^5*g^3*i^3) - (6*b^2*d^2*(A \\
&+ B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[c + d*x])/((b*c - a*d)^5*g^3*i^3) \\
&- (6*A*b^2*B*d^2*n*Log[c + d*x]^2)/((b*c - a*d)^5*g^3*i^3) + (6*b^2*B^2*d^ \\
&2*n^2*Log[a + b*x]*Log[c + d*x]^2)/((b*c - a*d)^5*g^3*i^3) - (6*b^2*B^2*d^2 \\
&*n*Log[e*((a + b*x)/(c + d*x))^n]*Log[c + d*x]^2)/((b*c - a*d)^5*g^3*i^3) - \\
&(2*b^2*B^2*d^2*n^2*Log[c + d*x]^3)/((b*c - a*d)^5*g^3*i^3) + (12*A*b^2*B*d \\
&^2*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)]/((b*c - a*d)^5*g^3*i^3) - \\
&(6*b^2*B^2*d^2*Log[(a + b*x)^n]^2*Log[(b*(c + d*x))/(b*c - a*d)]/((b*c - \\
&a*d)^5*g^3*i^3) + (12*b^2*B^2*d^2*n*Log[a + b*x]*Log[c + d*x]*Log[(c + d*x) \\
&]^(-n)]/((b*c - a*d)^5*g^3*i^3) + (6*b^2*B^2*d^2*Log[a + b*x]*Log[(c + d*x) \\
&]^(-n)]^2)/((b*c - a*d)^5*g^3*i^3) - (6*b^2*B^2*d^2*Log[-((d*(a + b*x))/(b*c \\
&- a*d))]*Log[(c + d*x)^(-n)]^2)/((b*c - a*d)^5*g^3*i^3) - (12*b^2*B^2*d^2* \\
&n*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x]*(Log[(a + b*x)^n] - Log[e* \\
&((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)]))/((b*c - a*d)^5*g^3*i^3) + \\
&(12*A*b^2*B*d^2*n*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))]/((b*c - a*d)^5* \\
&g^3*i^3) - (12*b^2*B^2*d^2*n*Log[(a + b*x)^n]*PolyLog[2, -((d*(a + b*x))/(b \\
&c - a*d))]/((b*c - a*d)^5*g^3*i^3) + (12*A*b^2*B*d^2*n*PolyLog[2, (b*(c + \\
&d*x))/(b*c - a*d)]/((b*c - a*d)^5*g^3*i^3) + (12*b^2*B^2*d^2*n*Log[(c + d \\
&x)^(-n)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]/((b*c - a*d)^5*g^3*i^3) - \\
&(12*b^2*B^2*d^2*n*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[ \\
&(c + d*x)^(-n)])*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]/((b*c - a*d)^5*g^3* \\
&i^3) + (12*b^2*B^2*d^2*n*Log[e*((a + b*x)/(c + d*x))^n]*PolyLog[2, 1 + (b*c \\
&- a*d)/(d*(a + b*x))]/((b*c - a*d)^5*g^3*i^3) + (12*b^2*B^2*d^2*n^2*PolyL \\
&og[3, -((d*(a + b*x))/(b*c - a*d))]/((b*c - a*d)^5*g^3*i^3) + (12*b^2*B^2* \\
&d^2*n^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)]/((b*c - a*d)^5*g^3*i^3) + (1 \\
&2*b^2*B^2*d^2*n^2*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))]/((b*c - a*d)^5 \\
&*g^3*i^3)
\end{aligned}$$

Rule 2528

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[{u = ExpandIntegrand[(a + b*Log[c*Rfx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[Rfx, x] && RationalFunci
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_.))^(m_.
), x_Symbol] := Simp[((d + e*x)^(m + 1)*(a + b*Log[c*Rfx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*
(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_)] /; FreeQ[b, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_.))^(m_.)*((c_.) + (d_.)*(x_.))^(n_.), x_Symbol] := Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(Rfx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_.)), x_S
ymbol] := Simp[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*Rfx^p])^(n - 1)*D[Rfx, x])/Rfx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[Rfx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_.))^(n_.)]*(b_.))^(p_.)*(Rfx_), x_Sy
mbol] := With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, Rfx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
Rfx, x] && IntegerQ[p]
```

Rule 2390



Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.)\*(x\_))^(q\_.), x\_Symbol] := Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] := Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n]))/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] := Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

### Rule 2391

Int[Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]/(x\_), x\_Symbol] := -Simp[PolyLog[2, -(c\*e\*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c\*d, 1]

### Rule 6688

Int[u\_, x\_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifyIntegrandQ[v, u, x]]

### Rule 6742

Int[u\_, x\_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]

### Rule 2411

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_.) + (g\_.)\*(x\_))^(q\_.)\*((h\_.) + (i\_.)\*(x\_))^(r\_.), x\_Symbol] := Dist[1/e, Subst[Int[((g\*x)/e)^q\*((e\*h - d\*i)/e + (i\*x)/e)^r\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e\*f - d

\*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2\*r]

### Rule 2344

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/((x\_)\*((d\_) + (e\_.)\*(x\_))),  
x\_Symbol] := Dist[1/d, Int[(a + b\*Log[c\*x^n])^p/x, x], x] - Dist[e/d, Int[  
(a + b\*Log[c\*x^n])^p/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I  
GtQ[p, 0]

### Rule 2317

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.)/((d\_) + (e\_.)\*(x\_)), x\_Symb  
ol] := Simp[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^p)/e, x] - Dist[(b\*n\*p)/e,  
Int[(Log[1 + (e\*x)/d]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b  
, c, d, e, n}, x] && IGtQ[p, 0]

### Rule 2507

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))  
^(r\_.)]^(s\_.)\*Log[(i\_.)\*((j\_.)\*((g\_.) + (h\_.)\*(x\_))^(t\_.))^(u\_.)]\*(v\_), x\_S  
ymbol] := With[{k = Simplify[v\*(a + b\*x)\*(c + d\*x)]}, Simp[(k\*Log[i\*(j\*(g +  
h\*x)^t]^u)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s + 1))/(p\*r\*(s + 1)\*(b\*c  
- a\*d)), x] - Dist[(k\*h\*t\*u)/(p\*r\*(s + 1)\*(b\*c - a\*d)), Int[Log[e\*(f\*(a +  
b\*x)^p\*(c + d\*x)^q]^r]^(s + 1)/(g + h\*x), x], x] /; FreeQ[k, x] /; FreeQ[{  
a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b\*c - a\*d, 0] &&  
EqQ[p + q, 0] && NeQ[s, -1]

### Rule 2488

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))  
^(r\_.)]^(s\_.)/((g\_.) + (h\_.)\*(x\_)), x\_Symbol] := -Simp[(Log[-((b\*c - a\*d)/(  
d\*(a + b\*x)))]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/h, x] + Dist[(p\*r\*s\*  
(b\*c - a\*d))/h, Int[(Log[-((b\*c - a\*d)/(d\*(a + b\*x)))]\*Log[e\*(f\*(a + b\*x)^p  
\*(c + d\*x)^q]^r]^(s - 1))/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{a, b, c,  
d, e, f, g, h, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && EqQ  
[b\*g - a\*h, 0] && IGtQ[s, 0]

### Rule 2506

Int[Log[v\_]\*Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))  
^(q\_.)]^(r\_.)]^(s\_.)\*(u\_), x\_Symbol] := With[{g = Simplify[((v - 1)\*(c + d  
\*x))/(a + b\*x)], h = Simplify[u\*(a + b\*x)\*(c + d\*x)]}, -Simp[(h\*PolyLog[2,  
1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/(b\*c - a\*d), x] + Dist[h\*p\*r  
\*s, Int[(PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1))/((  
a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f

, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]

### Rule 6610

Int[(u\_)\*PolyLog[n\_, v\_], x\_Symbol] := With[{w = DerivativeDivides[v, u\*v, x]}, Simp[w\*PolyLog[n + 1, v], x] /; !FalseQ[w]] /; FreeQ[n, x]

### Rule 2500

Int[(Log[(e\_)\*((f\_)\*((a\_) + (b\_)\*(x\_))^(p\_))\*((c\_) + (d\_)\*(x\_))^(q\_))^(r\_)]\*(s\_) + Log[(i\_)\*((g\_) + (h\_)\*(x\_))^(n\_)]\*(t\_)))/((j\_) + (k\_)\*(x\_)), x\_Symbol] := Dist[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q)^r] - Log[(a + b\*x)^(p\*r)] - Log[(c + d\*x)^(q\*r)], Int[(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x], x] + (Int[(Log[(a + b\*x)^(p\*r)]\*(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x] + Int[(Log[(c + d\*x)^(q\*r)]\*(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0]

### Rule 2433

Int[((a\_) + Log[(c\_)\*((d\_) + (e\_)\*(x\_))^(n\_)]\*(b\_))^(p\_)\*((f\_) + Log[(h\_)\*((i\_) + (j\_)\*(x\_))^(m\_)]\*(g\_))\*((k\_) + (l\_)\*(x\_))^(r\_)), x\_Symbol] := Dist[1/e, Subst[Int[((k\*x)/d)^r\*(a + b\*Log[c\*x^n])^p\*(f + g\*Log[h\*(e\*i - d\*j)/e + (j\*x)/e]^m)], x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e\*k - d\*l, 0]

### Rule 2375

Int[(Log[(d\_)\*((e\_) + (f\_)\*(x\_)^(m\_))^(r\_)]\*(a\_) + Log[(c\_)\*(x\_)^(n\_)]\*(b\_))^(p\_)]/(x\_), x\_Symbol] := Simp[(Log[d\*(e + f\*x^m)^r]\*(a + b\*Log[c\*x^n])^(p + 1))/(b\*n\*(p + 1)), x] - Dist[(f\*m\*r)/(b\*n\*(p + 1)), Int[(x^(m - 1)\*(a + b\*Log[c\*x^n])^(p + 1))/(e + f\*x^m), x], x] /; FreeQ[{a, b, c, d, e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d\*e, 1]

### Rule 2374

Int[(Log[(d\_)\*((e\_) + (f\_)\*(x\_)^(m\_)))]\*(a\_) + Log[(c\_)\*(x\_)^(n\_)]\*(b\_))^(p\_)]/(x\_), x\_Symbol] := -Simp[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^p)/m, x] + Dist[(b\*n\*p)/m, Int[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0] && EqQ[d\*e, 1]

### Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_Symbol]
:> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d, e, n, p}, x]
&& EqQ[b*d, a*e]
```

### Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol]
:> Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*1)/1) + (e*x)/1)^n])*(f +
g*Log[h*(-((j*k - i*1)/1) + (j*x)/1)^m]), x], x, k + l*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, m, n}, x]
&& IntegerQ[r]
```

### Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol]
:> Simp[Log[x]*(a + b*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Log[x]
*(a + b*Log[c*(d + e*x)^n])]/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x]
*(f + g*Log[h*(i + j*x)^m])]/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, m, n}, x]
&& EqQ[e*i - d*j, 0]
```

### Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.))*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.)
+ (k_.)*(x_)), x_Symbol]
:> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r)/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dist[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r}, x]
&& NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

### Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.)
*(x_)), x_Symbol]
:> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p}, x]
&& NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

### Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)/(x_), x_Symbol]
:> Dist[1/(b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
```

x]

### Rule 30

`Int[(x_)^(m_.), x_Symbol] := Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && NeQ[m, -1]`

### Rubi steps

$$\begin{aligned}
\int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(208c + 208dx)^3(ag + bgx)^3} dx &= \int \left[ \frac{b^3 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8998912(bc - ad)^3 g^3 (a + bx)^3} - \frac{3b^3 d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8998912(bc - ad)^4 g^3 (a + bx)^2} + \frac{3b^3 d^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4499456(bc - ad)^5 g^3 (a + bx)} \right] dx \\
&= \frac{(3b^3 d^2) \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx} dx}{4499456(bc - ad)^5 g^3} - \frac{(3b^2 d^3) \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{c+dx} dx}{4499456(bc - ad)^5 g^3} - \frac{(3b^3 d) \int \frac{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{a+bx} dx}{8998912(bc - ad)^4 g^3 (a + bx)^2} \\
&= -\frac{b^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17997824(bc - ad)^3 g^3 (a + bx)^2} + \frac{3b^2 d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8998912(bc - ad)^4 g^3 (a + bx)} + \frac{d^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17997824(bc - ad)^5 g^3 (a + bx)} \\
&= -\frac{b^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17997824(bc - ad)^3 g^3 (a + bx)^2} + \frac{3b^2 d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8998912(bc - ad)^4 g^3 (a + bx)} + \frac{d^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17997824(bc - ad)^5 g^3 (a + bx)} \\
&= -\frac{b^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17997824(bc - ad)^3 g^3 (a + bx)^2} + \frac{3b^2 d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8998912(bc - ad)^4 g^3 (a + bx)} + \frac{d^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17997824(bc - ad)^5 g^3 (a + bx)} \\
&= -\frac{b^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17997824(bc - ad)^3 g^3 (a + bx)^2} + \frac{3b^2 d \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{8998912(bc - ad)^4 g^3 (a + bx)} + \frac{d^2 \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{17997824(bc - ad)^5 g^3 (a + bx)} \\
&= -\frac{b^2 B n \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{17997824(bc - ad)^3 g^3 (a + bx)^2} + \frac{7b^2 B d n \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8998912(bc - ad)^4 g^3 (a + bx)} - \frac{B d^2 n \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{17997824(bc - ad)^5 g^3 (a + bx)} \\
&= -\frac{3b^2 B^2 d^2 \log(a + bx) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{4499456(bc - ad)^5 g^3} - \frac{b^2 B n \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{17997824(bc - ad)^3 g^3 (a + bx)^2} + \frac{7b^2 B d n \left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8998912(bc - ad)^4 g^3 (a + bx)} \\
&= -\frac{3b^2 B^2 d^2 \log\left(-\frac{bc-ad}{d(a+bx)}\right) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{4499456(bc - ad)^5 g^3} - \frac{3b^2 B^2 d^2 \log(a + bx) \log^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{4499456(bc - ad)^5 g^3} \\
&= -\frac{b^2 B^2 n^2}{35995648(bc - ad)^3 g^3 (a + bx)^2} + \frac{15b^2 B^2 d n^2}{17997824(bc - ad)^4 g^3 (a + bx)} + \frac{B^2 d^2 n^2}{35995648(bc - ad)^5 g^3 (a + bx)} \\
&= -\frac{b^2 B^2 n^2}{35995648(bc - ad)^3 g^3 (a + bx)^2} + \frac{15b^2 B^2 d n^2}{17997824(bc - ad)^4 g^3 (a + bx)} + \frac{B^2 d^2 n^2}{35995648(bc - ad)^5 g^3 (a + bx)}
\end{aligned}$$

**Mathematica [B]** time = 2.64962, size = 1653, normalized size = 2.26

result too large to display

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2/((a\*g + b\*g\*x)^3\*(c\*i + d\*i\*x)^3), x]

[Out]  $(8*b^2*B^2*d^2*n^2*(a + b*x)^2*(c + d*x)^2*\text{Log}[(a + b*x)/(c + d*x)]^3 + 2*B*n*\text{Log}[(a + b*x)/(c + d*x)]^2*(12*a^2*A*b^2*c^2*d^2 - b^4*B*c^4*n + 8*a*b^3*B*c^3*d*n - 8*a^3*b*B*c*d^3*n + a^4*B*d^4*n + 24*a*A*b^3*c^2*d^2*x + 24*a^2*A*b^2*c*d^3*x + 4*b^4*B*c^3*d*n*x + 24*a*b^3*B*c^2*d^2*n*x - 24*a^2*b^2*B*c*d^3*n*x - 4*a^3*b*B*d^4*n*x + 12*A*b^4*c^2*d^2*x^2 + 48*a*A*b^3*c*d^3*x^2 + 12*a^2*A*b^2*d^4*x^2 + 18*b^4*B*c^2*d^2*n*x^2 - 18*a^2*b^2*B*d^4*n*x^2 + 24*A*b^4*c*d^3*x^3 + 24*a*A*b^3*d^4*x^3 + 12*b^4*B*c*d^3*n*x^3 - 12*a*b^3*B*d^4*n*x^3 + 12*A*b^4*d^4*x^4 + 12*b^2*B*d^2*(a + b*x)^2*(c + d*x)^2*\text{Log}[e*((a + b*x)/(c + d*x))^n] - 12*b^2*B*d^2*n*(a + b*x)^2*(c + d*x)^2*\text{Log}[(a + b*x)/(c + d*x)] + 12*b^2*d^2*(a + b*x)^2*(c + d*x)^2*\text{Log}[a + b*x]*(2*A^2 + 5*B^2*n^2 + 4*A*B*(\text{Log}[e*((a + b*x)/(c + d*x))^n] - n*\text{Log}[(a + b*x)/(c + d*x)])) + 2*B^2*(\text{Log}[e*((a + b*x)/(c + d*x))^n] - n*\text{Log}[(a + b*x)/(c + d*x)])^2) + 2*b^2*d*(b*c - a*d)*(a + b*x)*(c + d*x)^2*(6*A^2 + 14*A*B*n + 15*B^2*n^2 + 6*B^2*\text{Log}[e*((a + b*x)/(c + d*x))^n]^2 - 2*B*n*(6*A + 7*B*n)*\text{Log}[(a + b*x)/(c + d*x)] + 6*B^2*n^2*\text{Log}[(a + b*x)/(c + d*x)]^2 + 2*B*\text{Log}[e*((a + b*x)/(c + d*x))^n]*(6*A + 7*B*n - 6*B*n*\text{Log}[(a + b*x)/(c + d*x)])) - b^2*(b*c - a*d)^2*(c + d*x)^2*(2*A^2 + 2*A*B*n + B^2*n^2 + 2*B^2*\text{Log}[e*((a + b*x)/(c + d*x))^n]^2 - 2*B*n*(2*A + B*n)*\text{Log}[(a + b*x)/(c + d*x)] + 2*B^2*n^2*\text{Log}[(a + b*x)/(c + d*x)]^2 + 2*B*\text{Log}[e*((a + b*x)/(c + d*x))^n]*(2*A + B*n - 2*B*n*\text{Log}[(a + b*x)/(c + d*x)])) + 2*B*(b*c - a*d)*n*\text{Log}[(a + b*x)/(c + d*x)]*(2*b*d^2*(a + b*x)^2*(c + d*x)*(6*A - 7*B*n + 6*B*\text{Log}[e*((a + b*x)/(c + d*x))^n] - 6*B*n*\text{Log}[(a + b*x)/(c + d*x)])) + 2*b^2*d*(a + b*x)*(c + d*x)^2*(6*A + 7*B*n + 6*B*\text{Log}[e*((a + b*x)/(c + d*x))^n] - 6*B*n*\text{Log}[(a + b*x)/(c + d*x)])) + d^2*(b*c - a*d)*(a + b*x)^2*(2*A - B*n + 2*B*\text{Log}[e*((a + b*x)/(c + d*x))^n] - 2*B*n*\text{Log}[(a + b*x)/(c + d*x)])) - b^2*(b*c - a*d)*(c + d*x)^2*(2*A + B*n + 2*B*\text{Log}[e*((a + b*x)/(c + d*x))^n] - 2*B*n*\text{Log}[(a + b*x)/(c + d*x)])) + d^2*(b*c - a*d)^2*(a + b*x)^2*(2*A^2 - 2*A*B*n + B^2*n^2 + 2*B^2*\text{Log}[e*((a + b*x)/(c + d*x))^n]^2 + 2*B*n*(-2*A + B*n)*\text{Log}[(a + b*x)/(c + d*x)] + 2*B^2*n^2*\text{Log}[(a + b*x)/(c + d*x)]^2 - 2*B*\text{Log}[e*((a + b*x)/(c + d*x))^n]*(-2*A + B*n + 2*B*n*\text{Log}[(a + b*x)/(c + d*x)])) + 2*b*d^2*(b*c - a*d)*(a + b*x)^2*(c + d*x)*(6*A^2 - 14*A*B*n + 15*B^2*n^2 + 6*B^2*\text{Log}[e*((a + b*x)/(c + d*x))^n]^2 + 2*B*n*(-6*A + 7*B*n)*\text{Log}[(a + b*x)/(c + d*x)] + 6*B^2*n^2*\text{Log}[(a + b*x)/(c + d*x)]^2 - 2*B*\text{Log}[e*((a + b*x)/(c + d*x))^n]*(-6*A + 7*B*n + 6*B*n*\text{Log}[(a + b*x)/(c + d*x)])) - 12*b^2*d^2*(a + b*x)^2*(c + d*x)^2*(2*A^2 + 5*B^2*n^2 + 4*A*B*(\text{Log}[e*((a + b*x)/(c + d*x))^n] - n*\text{Log}[(a$





$$\begin{aligned}
& 3) * x) / ((b^6 * c^4 * d^2 - 4 * a * b^5 * c^3 * d^3 + 6 * a^2 * b^4 * c^2 * d^4 - 4 * a^3 * b^3 * c * d^5 \\
& + a^4 * b^2 * d^6) * g^3 * i^3 * x^4 + 2 * (b^6 * c^5 * d - 3 * a * b^5 * c^4 * d^2 + 2 * a^2 * b^4 * c^3 * d^3 + 2 * a^3 * b^3 * c^2 * d^4 - 3 * a^4 * b^2 * c * d^5 + a^5 * b * d^6) * g^3 * i^3 * x^3 + (b^6 \\
& * c^6 - 9 * a^2 * b^4 * c^4 * d^2 + 16 * a^3 * b^3 * c^3 * d^3 - 9 * a^4 * b^2 * c^2 * d^4 + a^6 * d^6) \\
& ) * g^3 * i^3 * x^2 + 2 * (a * b^5 * c^6 - 3 * a^2 * b^4 * c^5 * d + 2 * a^3 * b^3 * c^4 * d^2 + 2 * a^4 * \\
& b^2 * c^3 * d^3 - 3 * a^5 * b * c^2 * d^4 + a^6 * c * d^5) * g^3 * i^3 * x + (a^2 * b^4 * c^6 - 4 * a^3 \\
& * b^3 * c^5 * d + 6 * a^4 * b^2 * c^4 * d^2 - 4 * a^5 * b * c^3 * d^3 + a^6 * c^2 * d^4) * g^3 * i^3) + \\
& 12 * b^2 * d^2 * \log(b * x + a) / ((b^5 * c^5 - 5 * a * b^4 * c^4 * d + 10 * a^2 * b^3 * c^3 * d^2 - 10 \\
& * a^3 * b^2 * c^2 * d^3 + 5 * a^4 * b * c * d^4 - a^5 * d^5) * g^3 * i^3) - 12 * b^2 * d^2 * \log(d * x + \\
& c) / ((b^5 * c^5 - 5 * a * b^4 * c^4 * d + 10 * a^2 * b^3 * c^3 * d^2 - 10 * a^3 * b^2 * c^2 * d^3 + 5 \\
& * a^4 * b * c * d^4 - a^5 * d^5) * g^3 * i^3) * \log(e * (b * x / (d * x + c) + a / (d * x + c))^n) - \\
& 1/4 * ((b^4 * c^4 - 32 * a * b^3 * c^3 * d + 32 * a^3 * b * c * d^3 - a^4 * d^4 - 60 * (b^4 * c * d^3 - \\
& a * b^3 * d^4) * x^3 - 8 * (b^4 * d^4 * x^4 + a^2 * b^2 * c^2 * d^2 + 2 * (b^4 * c * d^3 + a * b^3 * d^4) \\
& * x^3 + (b^4 * c^2 * d^2 + 4 * a * b^3 * c * d^3 + a^2 * b^2 * d^4) * x^2 + 2 * (a * b^3 * c^2 * d^2 \\
& + a^2 * b^2 * c * d^3) * x) * \log(b * x + a)^3 - 24 * (b^4 * d^4 * x^4 + a^2 * b^2 * c^2 * d^2 + \\
& 2 * (b^4 * c * d^3 + a * b^3 * d^4) * x^3 + (b^4 * c^2 * d^2 + 4 * a * b^3 * c * d^3 + a^2 * b^2 * d^4) \\
& * x^2 + 2 * (a * b^3 * c^2 * d^2 + a^2 * b^2 * c * d^3) * x) * \log(b * x + a) * \log(d * x + c)^2 + 8 \\
& * (b^4 * d^4 * x^4 + a^2 * b^2 * c^2 * d^2 + 2 * (b^4 * c * d^3 + a * b^3 * d^4) * x^3 + (b^4 * c^2 * \\
& d^2 + 4 * a * b^3 * c * d^3 + a^2 * b^2 * d^4) * x^2 + 2 * (a * b^3 * c^2 * d^2 + a^2 * b^2 * c * d^3) * \\
& x) * \log(d * x + c)^3 - 90 * (b^4 * c^2 * d^2 - a^2 * b^2 * d^4) * x^2 - 4 * (7 * b^4 * c^3 * d + 2 \\
& 4 * a * b^3 * c^2 * d^2 - 24 * a^2 * b^2 * c * d^3 - 7 * a^3 * b * d^4) * x - 60 * (b^4 * d^4 * x^4 + a^2 \\
& * b^2 * c^2 * d^2 + 2 * (b^4 * c * d^3 + a * b^3 * d^4) * x^3 + (b^4 * c^2 * d^2 + 4 * a * b^3 * c * d^3 \\
& + a^2 * b^2 * d^4) * x^2 + 2 * (a * b^3 * c^2 * d^2 + a^2 * b^2 * c * d^3) * x) * \log(b * x + a) + 1 \\
& 2 * (5 * b^4 * d^4 * x^4 + 5 * a^2 * b^2 * c^2 * d^2 + 10 * (b^4 * c * d^3 + a * b^3 * d^4) * x^3 + 5 * ( \\
& b^4 * c^2 * d^2 + 4 * a * b^3 * c * d^3 + a^2 * b^2 * d^4) * x^2 + 2 * (b^4 * d^4 * x^4 + a^2 * b^2 * c \\
& ^2 * d^2 + 2 * (b^4 * c * d^3 + a * b^3 * d^4) * x^3 + (b^4 * c^2 * d^2 + 4 * a * b^3 * c * d^3 + a^2 \\
& * b^2 * d^4) * x^2 + 2 * (a * b^3 * c^2 * d^2 + a^2 * b^2 * c * d^3) * x) * \log(b * x + a)^2 + 10 * (a \\
& * b^3 * c^2 * d^2 + a^2 * b^2 * c * d^3) * x) * \log(d * x + c))^n^2 / (a^2 * b^5 * c^7 * g^3 * i^3 - 5 \\
& * a^3 * b^4 * c^6 * d * g^3 * i^3 + 10 * a^4 * b^3 * c^5 * d^2 * g^3 * i^3 - 10 * a^5 * b^2 * c^4 * d^3 * g^3 \\
& * i^3 + 5 * a^6 * b * c^3 * d^4 * g^3 * i^3 - a^7 * c^2 * d^5 * g^3 * i^3 + (b^7 * c^5 * d^2 * g^3 * i^3 \\
& - 5 * a * b^6 * c^4 * d^3 * g^3 * i^3 + 10 * a^2 * b^5 * c^3 * d^4 * g^3 * i^3 - 10 * a^3 * b^4 * c^2 * d^5 \\
& * g^3 * i^3 + 5 * a^4 * b^3 * c * d^6 * g^3 * i^3 - a^5 * b^2 * d^7 * g^3 * i^3) * x^4 + 2 * (b^7 * c^6 * d * g^3 * i^3 - 4 * a * b^6 * c^5 * d^2 * g^3 * i^3 + 5 * a^2 * b^5 * c^4 * d^3 * g^3 * i^3 - 5 * a^4 * b^3 * c^2 * d^5 * g^3 * i^3 + 4 * a^5 * b^2 * c * d^6 * g^3 * i^3 - a^6 * b * d^7 * g^3 * i^3) * x^3 + (b^7 * c^7 * g^3 * i^3 - a * b^6 * c^6 * d * g^3 * i^3 - 9 * a^2 * b^5 * c^5 * d^2 * g^3 * i^3 + 25 * a^3 * b^4 * c^4 * d^3 * g^3 * i^3 - 25 * a^4 * b^3 * c^3 * d^4 * g^3 * i^3 + 9 * a^5 * b^2 * c^2 * d^5 * g^3 * i^3 + a^6 * b * c * d^6 * g^3 * i^3 - a^7 * d^7 * g^3 * i^3) * x^2 + 2 * (a * b^6 * c^7 * g^3 * i^3 - 4 * a^2 * b^5 * c^6 * d * g^3 * i^3 + 5 * a^3 * b^4 * c^5 * d^2 * g^3 * i^3 - 5 * a^5 * b^2 * c^3 * d^4 * g^3 * i^3 + 4 * a^6 * b * c^2 * d^5 * g^3 * i^3 - a^7 * c * d^6 * g^3 * i^3) * x) + 2 * (b^4 * c^4 - 16 * a * b^3 * c^3 * d + 30 * a^2 * b^2 * c^2 * d^2 - 16 * a^3 * b * c * d^3 + a^4 * d^4 - 12 * (b^4 * c^2 * d^2 - 2 * a * b^3 * c * d^3 + a^2 * b^2 * d^4) * x^2 + 12 * (b^4 * d^4 * x^4 + a^2 * b^2 * c^2 * d^2 + 2 * (b^4 * c * d^3 + a * b^3 * d^4) * x^3 + (b^4 * c^2 * d^2 + 4 * a * b^3 * c * d^3 + a^2 * b^2 * d^4) * x^2 + 2 * (a * b^3 * c^2 * d^2 + a^2 * b^2 * c * d^3) * x) * \log(b * x + a)^2 - 24 * (b^4 * d^4 * x^4 + a^2 * b^2 * c^2 * d^2 + 2 * (b^4 * c * d^3 + a * b^3 * d^4) * x^3 + (b^4 * c^2 * d^2 + 4 * a * b^3 * c * d^3 + a^2 * b^2 * d^4) * x^2 + 2 * (a * b^3 * c^2 * d^2 + a^2 * b^2 * c * d^3) * x) * \log(b * x + a) * \log
\end{aligned}$$

$$\begin{aligned}
&g(dx + c) + 12*(b^4*d^4*x^4 + a^2*b^2*c^2*d^2 + 2*(b^4*c*d^3 + a*b^3*d^4)* \\
&x^3 + (b^4*c^2*d^2 + 4*a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 2*(a*b^3*c^2*d^2 + \\
&a^2*b^2*c*d^3)*x)*\log(dx + c)^2 - 12*(b^4*c^3*d - a*b^3*c^2*d^2 - a^2*b^2* \\
&c*d^3 + a^3*b*d^4)*x)*n*\log(e*(b*x/(dx + c) + a/(dx + c))^n)/(a^2*b^5*c^7 \\
&*g^3*i^3 - 5*a^3*b^4*c^6*d*g^3*i^3 + 10*a^4*b^3*c^5*d^2*g^3*i^3 - 10*a^5*b^2* \\
&c^4*d^3*g^3*i^3 + 5*a^6*b*c^3*d^4*g^3*i^3 - a^7*c^2*d^5*g^3*i^3 + (b^7*c^ \\
&5*d^2*g^3*i^3 - 5*a*b^6*c^4*d^3*g^3*i^3 + 10*a^2*b^5*c^3*d^4*g^3*i^3 - 10*a \\
&^3*b^4*c^2*d^5*g^3*i^3 + 5*a^4*b^3*c*d^6*g^3*i^3 - a^5*b^2*d^7*g^3*i^3)*x^4 \\
&+ 2*(b^7*c^6*d*g^3*i^3 - 4*a*b^6*c^5*d^2*g^3*i^3 + 5*a^2*b^5*c^4*d^3*g^3*i \\
&^3 - 5*a^4*b^3*c^2*d^5*g^3*i^3 + 4*a^5*b^2*c*d^6*g^3*i^3 - a^6*b*d^7*g^3*i^ \\
&3)*x^3 + (b^7*c^7*g^3*i^3 - a*b^6*c^6*d*g^3*i^3 - 9*a^2*b^5*c^5*d^2*g^3*i^3 \\
&+ 25*a^3*b^4*c^4*d^3*g^3*i^3 - 25*a^4*b^3*c^3*d^4*g^3*i^3 + 9*a^5*b^2*c^2* \\
&d^5*g^3*i^3 + a^6*b*c*d^6*g^3*i^3 - a^7*d^7*g^3*i^3)*x^2 + 2*(a*b^6*c^7*g^3 \\
&*i^3 - 4*a^2*b^5*c^6*d*g^3*i^3 + 5*a^3*b^4*c^5*d^2*g^3*i^3 - 5*a^5*b^2*c^3* \\
&d^4*g^3*i^3 + 4*a^6*b*c^2*d^5*g^3*i^3 - a^7*c*d^6*g^3*i^3)*x)*B^2 - 1/2*(b \\
&^4*c^4 - 16*a*b^3*c^3*d + 30*a^2*b^2*c^2*d^2 - 16*a^3*b*c*d^3 + a^4*d^4 - 1 \\
&2*(b^4*c^2*d^2 - 2*a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 12*(b^4*d^4*x^4 + a^2*b \\
&^2*c^2*d^2 + 2*(b^4*c*d^3 + a*b^3*d^4)*x^3 + (b^4*c^2*d^2 + 4*a*b^3*c*d^3 + \\
&a^2*b^2*d^4)*x^2 + 2*(a*b^3*c^2*d^2 + a^2*b^2*c*d^3)*x)*\log(b*x + a)^2 - 2 \\
&4*(b^4*d^4*x^4 + a^2*b^2*c^2*d^2 + 2*(b^4*c*d^3 + a*b^3*d^4)*x^3 + (b^4*c^2 \\
&*d^2 + 4*a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + 2*(a*b^3*c^2*d^2 + a^2*b^2*c*d^3) \\
&*x)*\log(b*x + a)*\log(dx + c) + 12*(b^4*d^4*x^4 + a^2*b^2*c^2*d^2 + 2*(b^4* \\
&c*d^3 + a*b^3*d^4)*x^3 + (b^4*c^2*d^2 + 4*a*b^3*c*d^3 + a^2*b^2*d^4)*x^2 + \\
&2*(a*b^3*c^2*d^2 + a^2*b^2*c*d^3)*x)*\log(dx + c)^2 - 12*(b^4*c^3*d - a*b^3 \\
&*c^2*d^2 - a^2*b^2*c*d^3 + a^3*b*d^4)*x)*A*B*n/(a^2*b^5*c^7*g^3*i^3 - 5*a^3 \\
&*b^4*c^6*d*g^3*i^3 + 10*a^4*b^3*c^5*d^2*g^3*i^3 - 10*a^5*b^2*c^4*d^3*g^3*i^ \\
&3 + 5*a^6*b*c^3*d^4*g^3*i^3 - a^7*c^2*d^5*g^3*i^3 + (b^7*c^5*d^2*g^3*i^3 - \\
&5*a*b^6*c^4*d^3*g^3*i^3 + 10*a^2*b^5*c^3*d^4*g^3*i^3 - 10*a^3*b^4*c^2*d^5*g \\
&^3*i^3 + 5*a^4*b^3*c*d^6*g^3*i^3 - a^5*b^2*d^7*g^3*i^3)*x^4 + 2*(b^7*c^6*d* \\
&g^3*i^3 - 4*a*b^6*c^5*d^2*g^3*i^3 + 5*a^2*b^5*c^4*d^3*g^3*i^3 - 5*a^4*b^3*c \\
&^2*d^5*g^3*i^3 + 4*a^5*b^2*c*d^6*g^3*i^3 - a^6*b*d^7*g^3*i^3)*x^3 + (b^7*c^ \\
&7*g^3*i^3 - a*b^6*c^6*d*g^3*i^3 - 9*a^2*b^5*c^5*d^2*g^3*i^3 + 25*a^3*b^4*c^ \\
&4*d^3*g^3*i^3 - 25*a^4*b^3*c^3*d^4*g^3*i^3 + 9*a^5*b^2*c^2*d^5*g^3*i^3 + a^ \\
&6*b*c*d^6*g^3*i^3 - a^7*d^7*g^3*i^3)*x^2 + 2*(a*b^6*c^7*g^3*i^3 - 4*a^2*b^5 \\
&*c^6*d*g^3*i^3 + 5*a^3*b^4*c^5*d^2*g^3*i^3 - 5*a^5*b^2*c^3*d^4*g^3*i^3 + 4* \\
&a^6*b*c^2*d^5*g^3*i^3 - a^7*c*d^6*g^3*i^3)*x) + 1/2*A^2*((12*b^3*d^3*x^3 - \\
&b^3*c^3 + 7*a*b^2*c^2*d + 7*a^2*b*c*d^2 - a^3*d^3 + 18*(b^3*c*d^2 + a*b^2*d \\
&^3)*x^2 + 4*(b^3*c^2*d + 7*a*b^2*c*d^2 + a^2*b*d^3)*x)/((b^6*c^4*d^2 - 4*a* \\
&b^5*c^3*d^3 + 6*a^2*b^4*c^2*d^4 - 4*a^3*b^3*c*d^5 + a^4*b^2*d^6)*g^3*i^3*x^ \\
&4 + 2*(b^6*c^5*d - 3*a*b^5*c^4*d^2 + 2*a^2*b^4*c^3*d^3 + 2*a^3*b^3*c^2*d^4 \\
&- 3*a^4*b^2*c*d^5 + a^5*b*d^6)*g^3*i^3*x^3 + (b^6*c^6 - 9*a^2*b^4*c^4*d^2 + \\
&16*a^3*b^3*c^3*d^3 - 9*a^4*b^2*c^2*d^4 + a^6*d^6)*g^3*i^3*x^2 + 2*(a*b^5*c \\
&^6 - 3*a^2*b^4*c^5*d + 2*a^3*b^3*c^4*d^2 + 2*a^4*b^2*c^3*d^3 - 3*a^5*b*c^2* \\
&d^4 + a^6*c*d^5)*g^3*i^3*x + (a^2*b^4*c^6 - 4*a^3*b^3*c^5*d + 6*a^4*b^2*c^4 \\
&*d^2 - 4*a^5*b*c^3*d^3 + a^6*c^2*d^4)*g^3*i^3) + 12*b^2*d^2*\log(b*x + a)/((
\end{aligned}$$

$$b^5c^5 - 5a^4b^4c^4d + 10a^3b^3c^3d^2 - 10a^2b^2c^2d^3 + 5a^4b^4c^4d^4 - a^5d^5)g^3i^3) - 12b^2d^2\log(dx + c)/((b^5c^5 - 5a^4b^4c^4d + 10a^3b^3c^3d^2 - 10a^2b^2c^2d^3 + 5a^4b^4c^4d^4 - a^5d^5)g^3i^3))$$

**Fricas [B]** time = 0.8252, size = 6098, normalized size = 8.33

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3/(d*i*x+c*i)^3,x,
algorithm="fricas")
```

```
[Out] -1/4*(2*A^2*b^4*c^4 - 16*A^2*a*b^3*c^3*d + 16*A^2*a^3*b*c*d^3 - 2*A^2*a^4*d^4 - 12*(2*A^2*b^4*c*d^3 - 2*A^2*a*b^3*d^4 + 5*(B^2*b^4*c*d^3 - B^2*a*b^3*d^4)*n^2)*x^3 - 8*(B^2*b^4*d^4*n^2*x^4 + B^2*a^2*b^2*c^2*d^2*n^2 + 2*(B^2*b^4*c*d^3 + B^2*a*b^3*d^4)*n^2*x^3 + (B^2*b^4*c^2*d^2 + 4*B^2*a*b^3*c*d^3 + B^2*a^2*b^2*d^4)*n^2*x^2 + 2*(B^2*a*b^3*c^2*d^2 + B^2*a^2*b^2*c*d^3)*n^2*x)*log((b*x + a)/(d*x + c))^3 + (B^2*b^4*c^4 - 32*B^2*a*b^3*c^3*d + 32*B^2*a^3*b*c*d^3 - B^2*a^4*d^4)*n^2 - 6*(6*A^2*b^4*c^2*d^2 - 6*A^2*a^2*b^2*d^4 + 15*(B^2*b^4*c^2*d^2 - B^2*a^2*b^2*d^4)*n^2 + 4*(A*B*b^4*c^2*d^2 - 2*A*B*a*b^3*c*d^3 + A*B*a^2*b^2*d^4)*n)*x^2 + 2*(B^2*b^4*c^4 - 8*B^2*a*b^3*c^3*d + 8*B^2*a^3*b*c*d^3 - B^2*a^4*d^4 - 12*(B^2*b^4*c*d^3 - B^2*a*b^3*d^4)*x^3 - 18*(B^2*b^4*c^2*d^2 - B^2*a^2*b^2*d^4)*x^2 - 4*(B^2*b^4*c^3*d + 6*B^2*a*b^3*c^2*d^2 - 6*B^2*a^2*b^2*c*d^3 - B^2*a^3*b*d^4)*x - 12*(B^2*b^4*d^4*x^4 + B^2*a^2*b^2*c^2*d^2 + 2*(B^2*b^4*c*d^3 + B^2*a*b^3*d^4)*x^3 + (B^2*b^4*c^2*d^2 + 4*B^2*a*b^3*c*d^3 + B^2*a^2*b^2*d^4)*x^2 + 2*(B^2*a*b^3*c^2*d^2 + B^2*a^2*b^2*c*d^3)*x)*log((b*x + a)/(d*x + c))*log(e)^2 - 2*(12*A*B*b^4*d^4*n*x^4 + 12*A*B*a^2*b^2*c^2*d^2*n + 12*((B^2*b^4*c*d^3 - B^2*a*b^3*d^4)*n^2 + 2*(A*B*b^4*c*d^3 + A*B*a*b^3*d^4)*n)*x^3 - (B^2*b^4*c^4 - 8*B^2*a*b^3*c^3*d + 8*B^2*a^3*b*c*d^3 - B^2*a^4*d^4)*n^2 + 6*(3*(B^2*b^4*c^2*d^2 - B^2*a^2*b^2*d^4)*n^2 + 2*(A*B*b^4*c^2*d^2 + 4*A*B*a*b^3*c*d^3 + A*B*a^2*b^2*d^4)*n)*x^2 + 4*((B^2*b^4*c^3*d + 6*B^2*a*b^3*c^2*d^2 - 6*B^2*a^2*b^2*c*d^3 - B^2*a^3*b*d^4)*n^2 + 6*(A*B*a*b^3*c^2*d^2 + A*B*a^2*b^2*c*d^3)*n)*x)*log((b*x + a)/(d*x + c))^2 + 2*(A*B*b^4*c^4 - 16*A*B*a*b^3*c^3*d + 30*A*B*a^2*b^2*c^2*d^2 - 16*A*B*a^3*b*c*d^3 + A*B*a^4*d^4)*n - 4*(2*A^2*b^4*c^3*d + 12*A^2*a*b^3*c^2*d^2 - 12*A^2*a^2*b^2*c*d^3 - 2*A^2*a^3*b*d^4 + (7*B^2*b^4*c^3*d + 24*B^2*a*b^3*c^2*d^2 - 24*B^2*a^2*b^2*c*d^3 - 7*B^2*a^3*b*d^4)*n^2 + 6*(A*B*b^4*c^3*d - A*B*a*b^3*c^2*d^2 - A*B*a^2*b^2*c*d^3 + A*B*a^3*b*d^4)*n)*x + 2*(2*A*B*b^4*c^4 - 16*A*B*a*b^3*c^3*d + 16*A*B*a^3*b*c*d^3 - 2*A*B*a^4*d^4 - 24*(A*B*b^4*c*d^3 - A*B*a*b^3*d^4)*x^3 - 12*(3*A*B*b^4*c^2*d^2 - 3*A*B*a^2*b^2
```

$$\begin{aligned}
& *d^4 + (B^2*b^4*c^2*d^2 - 2*B^2*a*b^3*c*d^3 + B^2*a^2*b^2*d^4)*n)*x^2 - 12* \\
& (B^2*b^4*d^4*n*x^4 + B^2*a^2*b^2*c^2*d^2*n + 2*(B^2*b^4*c*d^3 + B^2*a*b^3*d \\
& ^4)*n*x^3 + (B^2*b^4*c^2*d^2 + 4*B^2*a*b^3*c*d^3 + B^2*a^2*b^2*d^4)*n*x^2 + \\
& 2*(B^2*a*b^3*c^2*d^2 + B^2*a^2*b^2*c*d^3)*n*x)*\log((b*x + a)/(d*x + c))^2 \\
& + (B^2*b^4*c^4 - 16*B^2*a*b^3*c^3*d + 30*B^2*a^2*b^2*c^2*d^2 - 16*B^2*a^3*b \\
& *c*d^3 + B^2*a^4*d^4)*n - 4*(2*A*B*b^4*c^3*d + 12*A*B*a*b^3*c^2*d^2 - 12*A* \\
& B*a^2*b^2*c*d^3 - 2*A*B*a^3*b*d^4 + 3*(B^2*b^4*c^3*d - B^2*a*b^3*c^2*d^2 - \\
& B^2*a^2*b^2*c*d^3 + B^2*a^3*b*d^4)*n)*x - 2*(12*A*B*b^4*d^4*x^4 + 12*A*B*a^ \\
& 2*b^2*c^2*d^2 + 12*(2*A*B*b^4*c*d^3 + 2*A*B*a*b^3*d^4 + (B^2*b^4*c*d^3 - B^ \\
& 2*a*b^3*d^4)*n)*x^3 + 6*(2*A*B*b^4*c^2*d^2 + 8*A*B*a*b^3*c*d^3 + 2*A*B*a^2* \\
& b^2*d^4 + 3*(B^2*b^4*c^2*d^2 - B^2*a^2*b^2*d^4)*n)*x^2 - (B^2*b^4*c^4 - 8*B \\
& ^2*a*b^3*c^3*d + 8*B^2*a^3*b*c*d^3 - B^2*a^4*d^4)*n + 4*(6*A*B*a*b^3*c^2*d^ \\
& 2 + 6*A*B*a^2*b^2*c*d^3 + (B^2*b^4*c^3*d + 6*B^2*a*b^3*c^2*d^2 - 6*B^2*a^2* \\
& b^2*c*d^3 - B^2*a^3*b*d^4)*n)*x)*\log((b*x + a)/(d*x + c))*\log(e) - 2*(12*A \\
& ^2*a^2*b^2*c^2*d^2 + 6*(5*B^2*b^4*d^4*n^2 + 2*A^2*b^4*d^4)*x^4 + 12*(2*A^2* \\
& b^4*c*d^3 + 2*A^2*a*b^3*d^4 + 5*(B^2*b^4*c*d^3 + B^2*a*b^3*d^4)*n^2 + 2*(A* \\
& B*b^4*c*d^3 - A*B*a*b^3*d^4)*n)*x^3 - (B^2*b^4*c^4 - 16*B^2*a*b^3*c^3*d - 1 \\
& 6*B^2*a^3*b*c*d^3 + B^2*a^4*d^4)*n^2 + 6*(2*A^2*b^4*c^2*d^2 + 8*A^2*a*b^3*c \\
& *d^3 + 2*A^2*a^2*b^2*d^4 + (7*B^2*b^4*c^2*d^2 + 16*B^2*a*b^3*c*d^3 + 7*B^2* \\
& a^2*b^2*d^4)*n^2 + 6*(A*B*b^4*c^2*d^2 - A*B*a^2*b^2*d^4)*n)*x^2 - 2*(A*B*b^ \\
& 4*c^4 - 8*A*B*a*b^3*c^3*d + 8*A*B*a^3*b*c*d^3 - A*B*a^4*d^4)*n + 4*(6*A^2*a \\
& *b^3*c^2*d^2 + 6*A^2*a^2*b^2*c*d^3 + 3*(B^2*b^4*c^3*d + 4*B^2*a*b^3*c^2*d^2 \\
& + 4*B^2*a^2*b^2*c*d^3 + B^2*a^3*b*d^4)*n^2 + 2*(A*B*b^4*c^3*d + 6*A*B*a*b^ \\
& 3*c^2*d^2 - 6*A*B*a^2*b^2*c*d^3 - A*B*a^3*b*d^4)*n)*x)*\log((b*x + a)/(d*x + \\
& c)))/((b^7*c^5*d^2 - 5*a*b^6*c^4*d^3 + 10*a^2*b^5*c^3*d^4 - 10*a^3*b^4*c^2 \\
& *d^5 + 5*a^4*b^3*c*d^6 - a^5*b^2*d^7)*g^3*i^3*x^4 + 2*(b^7*c^6*d - 4*a*b^6* \\
& c^5*d^2 + 5*a^2*b^5*c^4*d^3 - 5*a^4*b^3*c^2*d^5 + 4*a^5*b^2*c*d^6 - a^6*b*d \\
& ^7)*g^3*i^3*x^3 + (b^7*c^7 - a*b^6*c^6*d - 9*a^2*b^5*c^5*d^2 + 25*a^3*b^4*c \\
& ^4*d^3 - 25*a^4*b^3*c^3*d^4 + 9*a^5*b^2*c^2*d^5 + a^6*b*c*d^6 - a^7*d^7)*g^ \\
& 3*i^3*x^2 + 2*(a*b^6*c^7 - 4*a^2*b^5*c^6*d + 5*a^3*b^4*c^5*d^2 - 5*a^5*b^2* \\
& c^3*d^4 + 4*a^6*b*c^2*d^5 - a^7*c*d^6)*g^3*i^3*x + (a^2*b^5*c^7 - 5*a^3*b^4 \\
& *c^6*d + 10*a^4*b^3*c^5*d^2 - 10*a^5*b^2*c^4*d^3 + 5*a^6*b*c^3*d^4 - a^7*c^ \\
& 2*d^5)*g^3*i^3)
\end{aligned}$$


---

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**3/(d*i*x+c*i)**3
,x)
```

[Out] Timed out

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2}{(bgx + ag)^3 (dix + ci)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^3/(d\*i\*x+c\*i)^3,x,  
algorithm="giac")

[Out] integrate((B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)^2/((b\*g\*x + a\*g)^3\*(d\*i\*x  
+ c\*i)^3), x)

$$3.209 \quad \int \frac{\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^4(ci+dix)^3} dx$$

**Optimal.** Leaf size=908

$$\frac{2B^2n^2(c+dx)^3b^5}{27(bc-ad)^6g^4i^3(a+bx)^3} - \frac{(c+dx)^3\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2b^5}{3(bc-ad)^6g^4i^3(a+bx)^3} - \frac{2Bn(c+dx)^3\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)b^5}{9(bc-ad)^6g^4i^3(a+bx)^3} + \frac{5B^2a}{4(bc-ad)}$$

[Out]  $-(B^2d^5n^2(a+bx)^2)/(4(b^3c-ad)^6g^4i^3(c+dx)^2) - (10Ab^3B^2d^4n^2(a+bx))/((b^3c-ad)^6g^4i^3(c+dx)) + (10b^3B^2d^4n^2(a+bx))/((b^3c-ad)^6g^4i^3(c+dx)) - (20b^3B^2d^2n^2(c+dx))/((b^3c-ad)^6g^4i^3(a+bx)) + (5b^4B^2d^2n^2(c+dx)^2)/(4(b^3c-ad)^6g^4i^3(a+bx)^2) - (2b^5B^2n^2(c+dx)^3)/(27(b^3c-ad)^6g^4i^3(a+bx)^3) - (10b^3B^2d^4n^2(a+bx) \cdot \text{Log}[e((a+bx)/(c+dx))^n])/((b^3c-ad)^6g^4i^3(c+dx)) + (B^2d^5n^2(a+bx)^2(A+B \text{Log}[e((a+bx)/(c+dx))^n]))/(2(b^3c-ad)^6g^4i^3(c+dx)^2) - (20b^3B^2d^2n^2(c+dx)(A+B \text{Log}[e((a+bx)/(c+dx))^n]))/((b^3c-ad)^6g^4i^3(a+bx)) + (5b^4B^2d^2n^2(c+dx)^2(A+B \text{Log}[e((a+bx)/(c+dx))^n]))/(2(b^3c-ad)^6g^4i^3(a+bx)^2) - (2b^5B^2n^2(c+dx)^3(A+B \text{Log}[e((a+bx)/(c+dx))^n]))/(9(b^3c-ad)^6g^4i^3(a+bx)^3) - (d^5(a+bx)^2(A+B \text{Log}[e((a+bx)/(c+dx))^n])^2)/(2(b^3c-ad)^6g^4i^3(c+dx)^2) + (5b^4d^4(a+bx)(A+B \text{Log}[e((a+bx)/(c+dx))^n])^2)/((b^3c-ad)^6g^4i^3(c+dx)) - (10b^3d^2(c+dx)(A+B \text{Log}[e((a+bx)/(c+dx))^n])^2)/((b^3c-ad)^6g^4i^3(a+bx)) + (5b^4d^2(c+dx)^2(A+B \text{Log}[e((a+bx)/(c+dx))^n])^2)/(2(b^3c-ad)^6g^4i^3(a+bx)^2) - (b^5(c+dx)^3(A+B \text{Log}[e((a+bx)/(c+dx))^n])^2)/(3(b^3c-ad)^6g^4i^3(a+bx)^3) - (10b^2d^3(A+B \text{Log}[e((a+bx)/(c+dx))^n])^3)/(3B(b^3c-ad)^6g^4i^3n)$

**Rubi [C]** time = 10.511, antiderivative size = 2610, normalized size of antiderivative = 2.87, number of steps used = 195, number of rules used = 31, integrand size = 45,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.689$ , Rules used = {2528, 2525, 12, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2411, 2344, 2317, 2507, 2488, 2506, 6610, 2500, 2433, 2375, 2374, 6589, 2440, 2434, 2499, 2396, 2302, 30}

result too large to display

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2/((a\*g + b\*g\*x)^4\*(c\*i + d\*i\*x)^3),x]

[Out] 
$$\begin{aligned} & (-2*b^2*B^2*n^2)/(27*(b*c - a*d)^3*g^4*i^3*(a + b*x)^3) + (37*b^2*B^2*d*n^2) / \\ & ((36*(b*c - a*d)^4*g^4*i^3*(a + b*x)^2) - (319*b^2*B^2*d^2*n^2)/(18*(b*c - a*d)^5*g^4*i^3*(a + b*x)) - (B^2*d^3*n^2)/(4*(b*c - a*d)^4*g^4*i^3*(c + d*x)^2) - \\ & (19*b*B^2*d^3*n^2)/(2*(b*c - a*d)^5*g^4*i^3*(c + d*x)) - (245*b^2*B^2*d^3*n^2*Log[a + b*x]) / (9*(b*c - a*d)^6*g^4*i^3) + (10*A*b^2*B*d^3*n*Log[a + b*x]^2) / ((b*c - a*d)^6*g^4*i^3) + (10*b^2*B^2*d^3*n^2*Log[a + b*x]^2) / (3*(b*c - a*d)^6*g^4*i^3) + (10*b^2*B^2*d^3*Log[-((b*c - a*d)/(d*(a + b*x))]) * Log[e*((a + b*x)/(c + d*x))^n]^2) / ((b*c - a*d)^6*g^4*i^3) + (10*b^2*B^2*d^3*Log[a + b*x] * Log[e*((a + b*x)/(c + d*x))^n]^2) / ((b*c - a*d)^6*g^4*i^3) - \\ & (2*b^2*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) / (9*(b*c - a*d)^3*g^4*i^3*(a + b*x)^3) + (11*b^2*B*d*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) / (6*(b*c - a*d)^4*g^4*i^3*(a + b*x)^2) - (47*b^2*B*d^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) / (3*(b*c - a*d)^5*g^4*i^3*(a + b*x)) + (B*d^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) / (2*(b*c - a*d)^4*g^4*i^3*(c + d*x)^2) + (9*b*B*d^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) / ((b*c - a*d)^5*g^4*i^3*(c + d*x)) - (20*b^2*B*d^3*n*Log[a + b*x] * (A + B*Log[e*((a + b*x)/(c + d*x))^n]) / (3*(b*c - a*d)^6*g^4*i^3) - (b^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2) / (3*(b*c - a*d)^3*g^4*i^3*(a + b*x)^3) + (3*b^2*d*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2) / (2*(b*c - a*d)^4*g^4*i^3*(a + b*x)^2) - (6*b^2*d^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2) / ((b*c - a*d)^5*g^4*i^3*(a + b*x)) - (d^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2) / (2*(b*c - a*d)^4*g^4*i^3*(c + d*x)^2) - (4*b*d^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2) / ((b*c - a*d)^5*g^4*i^3*(c + d*x)) - (10*b^2*d^3*Log[a + b*x] * (A + B*Log[e*((a + b*x)/(c + d*x))^n])^2) / ((b*c - a*d)^6*g^4*i^3) + (245*b^2*B^2*d^3*n^2*Log[c + d*x]) / (9*(b*c - a*d)^6*g^4*i^3) - (20*A*b^2*B*d^3*n*Log[-((d*(a + b*x))/(b*c - a*d))] * Log[c + d*x]) / ((b*c - a*d)^6*g^4*i^3) - (20*b^2*B^2*d^3*n^2*Log[-((d*(a + b*x))/(b*c - a*d))] * Log[c + d*x]) / (3*(b*c - a*d)^6*g^4*i^3) - (10*b^2*B^2*d^3*Log[(a + b*x)^n]^2 * Log[c + d*x]) / ((b*c - a*d)^6*g^4*i^3) + (20*b^2*B*d^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) * Log[c + d*x]) / (3*(b*c - a*d)^6*g^4*i^3) + (10*b^2*d^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 * Log[c + d*x]) / ((b*c - a*d)^6*g^4*i^3) + (10*A*b^2*B*d^3*n*Log[c + d*x]^2) / ((b*c - a*d)^6*g^4*i^3) + (10*b^2*B^2*d^3*n^2*Log[c + d*x]^2) / (3*(b*c - a*d)^6*g^4*i^3) - (10*b^2*B^2*d^3*n^2*Log[a + b*x] * Log[c + d*x]^2) / ((b*c - a*d)^6*g^4*i^3) + (10*b^2*B^2*d^3*n*Log[e*((a + b*x)/(c + d*x))^n] * Log[c + d*x]^2) / ((b*c - a*d)^6*g^4*i^3) + (10*b^2*B^2*d^3*n^2*Log[c + d*x]^3) / (3*(b*c - a*d)^6*g^4*i^3) - (20*A*b^2*B*d^3*n*Log[a + b*x] * Log[(b*(c + d*x))/(b*c - a*d)]) / ((b*c - a*d)^6*g^4*i^3) - (20*b^2*B^2*d^3*n^2*Log[a + b*x] * Log[(b*(c + d*x))/(b*c - a*d)]) / (3*(b*c - a*d)^6*g^4*i^3) + (10*b^2*B^2*d^3*Log[(a + b*x)^n]^2 * Log[(b*(c + d*x))/(b*c - a*d)]) / ((b*c - a*d)^6*g^4*i^3) - (20*b^2*B^2*d^3*n*Log[a + b*x] * Log[(b*(c + d*x))/(b*c - a*d)]) / ((b*c - a*d)^6*g^4*i^3) - (20*b^2*B^2*d^3*n*Log[a + b*x] * Log[c + d*x] * Log[(c + d*x)^(-n)]) / ((b*c - a*d)^6*g^4*i^3) - (10*b^2*B^2*d^3*Log[a + b*x] * Log[(c + d*x)^(-n)]^2) / ((b*c - a*d)^6*g^4*i^3) \end{aligned}$$

$$\begin{aligned}
& + (10*b^2*B^2*d^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^{-n}]^2) \\
& /((b*c - a*d)^6*g^4*i^3) + (20*b^2*B^2*d^3*n*Log[-((d*(a + b*x))/(b*c - a*d))] \\
& ) * Log[c + d*x] * (Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^{-n}]) \\
& ) /((b*c - a*d)^6*g^4*i^3) - (20*A*b^2*B*d^3*n*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))] \\
& ) /((b*c - a*d)^6*g^4*i^3) - (20*b^2*B^2*d^3*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))] \\
& ) /((b*c - a*d)^6*g^4*i^3) + (20*b^2*B^2*d^3*n*Log[(a + b*x)^n]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))] \\
& ) /((b*c - a*d)^6*g^4*i^3) - (20*A*b^2*B*d^3*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] \\
& ) /((b*c - a*d)^6*g^4*i^3) - (20*b^2*B^2*d^3*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] \\
& ) /((b*c - a*d)^6*g^4*i^3) - (20*b^2*B^2*d^3*n*Log[(c + d*x)^{-n}]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] \\
& ) /((b*c - a*d)^6*g^4*i^3) + (20*b^2*B^2*d^3*n*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^{-n}]) \\
& ) * PolyLog[2, (b*(c + d*x))/(b*c - a*d)] /((b*c - a*d)^6*g^4*i^3) - (20*b^2*B^2*d^3*n*Log[e*((a + b*x)/(c + d*x))^n] \\
& ) * PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))] /((b*c - a*d)^6*g^4*i^3) - (20*b^2*B^2*d^3*n^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))] \\
& ) /((b*c - a*d)^6*g^4*i^3) - (20*b^2*B^2*d^3*n^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)] /((b*c - a*d)^6*g^4*i^3) - (20*b^2*B^2*d^3*n^2*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))] \\
& ) /((b*c - a*d)^6*g^4*i^3)
\end{aligned}$$

### Rule 2528

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] := With
[ {u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u]
] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFunctionQ[RGx, x] && IGtQ[n, 0]

```

### Rule 2525

```

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.), x_Symbol] := Simp[ ((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1)), x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[ ((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] || IntegerQ[m]) && NeQ[m, -1]

```

### Rule 12

```

Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b_)*(v_) /; FreeQ[b, x]]

```

### Rule 44

```

Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] := Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &

```



& NeQ[b\*c - a\*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])

#### Rule 2524

Int[((a\_.) + Log[(c\_.)\*(RFx\_)^(p\_.)]\*(b\_.))^(n\_.)/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] :> Simp[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^n)/e, x] - Dist[(b\*n\*p)/e, Int[(Log[d + e\*x]\*(a + b\*Log[c\*RFx^p])^(n - 1)\*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

#### Rule 2418

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*(RFx\_), x\_Symbol] :> With[{u = ExpandIntegrand[(a + b\*Log[c\*(d + e\*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]

#### Rule 2390

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_) + (g\_.)\*(x\_))^(q\_.), x\_Symbol] :> Dist[1/e, Subst[Int[((f\*x)/d)^q\*(a + b\*Log[c\*x^n])^p, x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e\*f - d\*g, 0]

#### Rule 2301

Int[((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))/(x\_), x\_Symbol] :> Simp[(a + b\*Log[c\*x^n])^2/(2\*b\*n), x] /; FreeQ[{a, b, c, n}, x]

#### Rule 2394

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :> Simp[(Log[(e\*(f + g\*x))/(e\*f - d\*g)]\*(a + b\*Log[c\*(d + e\*x)^n]))/g, x] - Dist[(b\*e\*n)/g, Int[Log[(e\*(f + g\*x))/(e\*f - d\*g)]/(d + e\*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e\*f - d\*g, 0]

#### Rule 2393

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_))]\*(b\_.))/((f\_.) + (g\_.)\*(x\_)), x\_Symbol] :> Dist[1/g, Subst[Int[(a + b\*Log[1 + (c\*e\*x)/g])/x, x], x, f + g\*x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e\*f - d\*g, 0] && EqQ[g + c\*(e\*f - d\*g), 0]

#### Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] := -Simp[PolyLog[2, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

### Rule 6688

```
Int[u_, x_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifierIntegrandQ[v, u, x]]
```

### Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]
```

### Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]*(b_.))^(p_.)*((f_.) + (g_.)*(x_)^(q_.))*((h_.) + (i_.)*(x_)^(r_.)), x_Symbol] := Dist[1/e, Subst[Int[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

### Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_Symbol] := Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]
```

### Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol] := Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e, Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0]
```

### Rule 2507

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_)^(p_.))*((c_.) + (d_.)*(x_)^(q_.))^(r_.)]^(s_.)*Log[(i_.)*((j_.)*((g_.) + (h_.)*(x_)^(t_.))^(u_.))*(v_), x_Symbol] := With[{k = Simplify[v*(a + b*x)*(c + d*x)]}, Simp[(k*Log[i*(j*(g + h*x)^t]^u)*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s + 1))/(p*r*(s + 1)*(b*c - a*d)), x] - Dist[(k*h*t*u)/(p*r*(s + 1)*(b*c - a*d)), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s + 1)/(g + h*x), x], x] /; FreeQ[k, x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, p, q, r, s, t, u}, x] && NeQ[b*c - a*d, 0] &&
```

EqQ[p + q, 0] && NeQ[s, -1]

### Rule 2488

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.)/((g\_.) + (h\_.)\*(x\_)), x\_Symbol] := -Simp[(Log[-((b\*c - a\*d)/(d\*(a + b\*x)))]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/h, x] + Dist[(p\*r\*s\*(b\*c - a\*d))/h, Int[(Log[-((b\*c - a\*d)/(d\*(a + b\*x)))]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1))/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && EqQ[b\*g - a\*h, 0] && IGtQ[s, 0]

### Rule 2506

Int[Log[v\_]\*Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.)\*(u\_), x\_Symbol] := With[{g = Simplify[(v - 1)\*(c + d\*x)/(a + b\*x)], h = Simplify[u\*(a + b\*x)\*(c + d\*x)]}, -Simp[(h\*PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/(b\*c - a\*d), x] + Dist[h\*p\*r\*s, Int[(PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1))/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]

### Rule 6610

Int[(u\_)\*PolyLog[n\_, v\_], x\_Symbol] := With[{w = DerivativeDivides[v, u\*v, x]}, Simp[w\*PolyLog[n + 1, v], x] /; !FalseQ[w]] /; FreeQ[n, x]

### Rule 2500

Int[(Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]\*((s\_.) + Log[(i\_.)\*((g\_.) + (h\_.)\*(x\_))^(n\_.)]\*(t\_.)))/((j\_.) + (k\_.)\*(x\_)), x\_Symbol] := Dist[Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r] - Log[(a + b\*x)^(p\*r)] - Log[(c + d\*x)^(q\*r)], Int[(s + t\*Log[i\*(g + h\*x)^n])/(j + k\*x), x], x] + (Int[(Log[(a + b\*x)^(p\*r)]\*(s + t\*Log[i\*(g + h\*x)^n]))/(j + k\*x), x] + Int[(Log[(c + d\*x)^(q\*r)]\*(s + t\*Log[i\*(g + h\*x)^n]))/(j + k\*x), x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0]

### Rule 2433

Int[((a\_.) + Log[(c\_.)\*((d\_.) + (e\_.)\*(x\_))^(n\_.)]\*(b\_.))^(p\_.)\*((f\_.) + Log[(h\_.)\*((i\_.) + (j\_.)\*(x\_))^(m\_.)]\*(g\_.))\*((k\_.) + (l\_.)\*(x\_))^(r\_.), x\_Symbol] := Dist[1/e, Subst[Int[((k\*x)/d)^r\*(a + b\*Log[c\*x^n])^p\*(f + g\*Log[h\*(e\*i - d\*j)/e + (j\*x)/e]^m)], x], x, d + e\*x], x] /; FreeQ[{a, b, c, d, e,

f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e\*k - d\*1, 0]

### Rule 2375

Int[(Log[(d\_.)\*((e\_) + (f\_.)\*(x\_)^(m\_.))^(r\_.)]\*((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.))/(x\_), x\_Symbol] :> Simp[(Log[d\*(e + f\*x^m)^r]\*(a + b\*Log[c\*x^n])^(p + 1))/(b\*n\*(p + 1)), x] - Dist[(f\*m\*r)/(b\*n\*(p + 1)), Int[(x^(m - 1)\*(a + b\*Log[c\*x^n])^(p + 1))/(e + f\*x^m), x], x] /; FreeQ[{a, b, c, d, e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d\*e, 1]

### Rule 2374

Int[(Log[(d\_.)\*((e\_) + (f\_.)\*(x\_)^(m\_.))]\*((a\_.) + Log[(c\_.)\*(x\_)^(n\_.)]\*(b\_.))^(p\_.))/(x\_), x\_Symbol] :> -Simp[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^p)/m, x] + Dist[(b\*n\*p)/m, Int[(PolyLog[2, -(d\*f\*x^m)]\*(a + b\*Log[c\*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0] && EqQ[d\*e, 1]

### Rule 6589

Int[PolyLog[n\_, (c\_.)\*((a\_.) + (b\_.)\*(x\_)^(p\_.))]/((d\_.) + (e\_.)\*(x\_)), x\_Symbol] :> Simp[PolyLog[n + 1, c\*(a + b\*x)^p]/(e\*p), x] /; FreeQ[{a, b, c, d, e, n, p}, x] && EqQ[b\*d, a\*e]

### Rule 2440

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]\*(b\_.))\*((f\_.) + Log[(h\_.)\*((i\_.) + (j\_.)\*(x\_)^(m\_.))]\*(g\_.))\*((k\_) + (l\_.)\*(x\_)^(r\_.)), x\_Symbol] :> Dist[1/l, Subst[Int[x^r\*(a + b\*Log[c\*(-((e\*k - d\*1)/1) + (e\*x)/1)^n])\*(f + g\*Log[h\*(-((j\*k - i\*1)/1) + (j\*x)/1)^m]), x], x, k + l\*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]

### Rule 2434

Int[((a\_.) + Log[(c\_.)\*((d\_) + (e\_.)\*(x\_)^(n\_.))]\*(b\_.))\*((f\_.) + Log[(h\_.)\*((i\_.) + (j\_.)\*(x\_)^(m\_.))]\*(g\_.)))/(x\_), x\_Symbol] :> Simp[Log[x]\*(a + b\*Log[c\*(d + e\*x)^n])\*(f + g\*Log[h\*(i + j\*x)^m]), x] + (-Dist[e\*g\*m, Int[(Log[x]\*(a + b\*Log[c\*(d + e\*x)^n])]/(d + e\*x), x], x] - Dist[b\*j\*n, Int[(Log[x]\*(f + g\*Log[h\*(i + j\*x)^m])]/(i + j\*x), x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, m, n}, x] && EqQ[e\*i - d\*j, 0]

### Rule 2499

Int[(Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_)^(p\_.))\*((c\_.) + (d\_.)\*(x\_)^(q\_.))^(r\_.)]\*((s\_.) + Log[(i\_.)\*((g\_.) + (h\_.)\*(x\_)^(n\_.))]\*(t\_.))^(m\_.))/(j\_.

```
) + (k_.)*(x_), x_Symbol] := Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q]^r)/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

### Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] := Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

### Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] := Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
x]
```

### Rule 30

```
Int[(x_)^(m_.), x_Symbol] := Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

### Rubi steps

$$\int \frac{\left(A + B \log\left(e^{\left(\frac{a+bx}{c+dx}\right)^n}\right)\right)^2}{(209c + 209dx)^3(ag + bgx)^4} dx = -\frac{2b^2B^2n^2}{246491883(bc - ad)^3g^4(a + bx)^3} + \frac{37b^2B^2dn^2}{328655844(bc - ad)^4g^4(a + bx)^2} - \frac{1493890}{1493890}$$

**Mathematica [B]** time = 4.30853, size = 2138, normalized size = 2.35

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/((a*g + b*g*x)^4*(c*i +
d*i*x)^3), x]
```

```

[Out] -(360*b^2*B^2*d^3*n^2*(a + b*x)^3*(c + d*x)^2*Log[(a + b*x)/(c + d*x)]^3 +
18*B*n*Log[(a + b*x)/(c + d*x)]^2*(60*a^3*A*b^2*c^2*d^3 + 2*b^5*B*c^5*n - 1
5*a*b^4*B*c^4*d*n + 60*a^2*b^3*B*c^3*d^2*n - 30*a^4*b*B*c*d^4*n + 3*a^5*B*d
^5*n + 180*a^2*A*b^3*c^2*d^3*x + 120*a^3*A*b^2*c*d^4*x - 5*b^5*B*c^4*d*n*x
+ 60*a*b^4*B*c^3*d^2*n*x + 180*a^2*b^3*B*c^2*d^3*n*x - 120*a^3*b^2*B*c*d^4*
n*x - 15*a^4*b*B*d^5*n*x + 180*a*A*b^4*c^2*d^3*x^2 + 360*a^2*A*b^3*c*d^4*x^
2 + 60*a^3*A*b^2*d^5*x^2 + 20*b^5*B*c^3*d^2*n*x^2 + 270*a*b^4*B*c^2*d^3*n*x
^2 - 90*a^3*b^2*B*d^5*n*x^2 + 60*A*b^5*c^2*d^3*x^3 + 360*a*A*b^4*c*d^4*x^3
+ 180*a^2*A*b^3*d^5*x^3 + 110*b^5*B*c^2*d^3*n*x^3 + 180*a*b^4*B*c*d^4*n*x^3
- 90*a^2*b^3*B*d^5*n*x^3 + 120*A*b^5*c*d^4*x^4 + 180*a*A*b^4*d^5*x^4 + 100
*b^5*B*c*d^4*n*x^4 + 60*A*b^5*d^5*x^5 + 20*b^5*B*d^5*n*x^5 + 60*b^2*B*d^3*(
a + b*x)^3*(c + d*x)^2*Log[e*((a + b*x)/(c + d*x))^n] - 60*b^2*B*d^3*n*(a +
b*x)^3*(c + d*x)^2*Log[(a + b*x)/(c + d*x)]) + 6*b^2*d^2*(b*c - a*d)*(a +
b*x)^2*(c + d*x)^2*(108*A^2 + 282*A*B*n + 319*B^2*n^2 + 108*B^2*Log[e*((a +
b*x)/(c + d*x))^n]^2 - 6*B*n*(36*A + 47*B*n)*Log[(a + b*x)/(c + d*x)] + 10
8*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 6*B*Log[e*((a + b*x)/(c + d*x))^n]*(
36*A + 47*B*n - 36*B*n*Log[(a + b*x)/(c + d*x)])) - 3*b^2*d*(b*c - a*d)^2*(
a + b*x)*(c + d*x)^2*(54*A^2 + 66*A*B*n + 37*B^2*n^2 + 54*B^2*Log[e*((a + b
*x)/(c + d*x))^n]^2 - 6*B*n*(18*A + 11*B*n)*Log[(a + b*x)/(c + d*x)] + 54*B
^2*n^2*Log[(a + b*x)/(c + d*x)]^2 + 6*B*Log[e*((a + b*x)/(c + d*x))^n]*(18*
A + 11*B*n - 18*B*n*Log[(a + b*x)/(c + d*x)])) + 4*b^2*(b*c - a*d)^3*(c + d
*x)^2*(9*A^2 + 6*A*B*n + 2*B^2*n^2 + 9*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2
- 6*B*n*(3*A + B*n)*Log[(a + b*x)/(c + d*x)] + 9*B^2*n^2*Log[(a + b*x)/(c
+ d*x)]^2 + 6*B*Log[e*((a + b*x)/(c + d*x))^n]*(3*A + B*n - 3*B*n*Log[(a +
b*x)/(c + d*x)])) + 60*b^2*d^3*(a + b*x)^3*(c + d*x)^2*Log[a + b*x]*(18*A^2
+ 12*A*B*n + 49*B^2*n^2 + 18*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 - 12*B*n
*(3*A + B*n)*Log[(a + b*x)/(c + d*x)] + 18*B^2*n^2*Log[(a + b*x)/(c + d*x)]
^2 + 12*B*Log[e*((a + b*x)/(c + d*x))^n]*(3*A + B*n - 3*B*n*Log[(a + b*x)/(
c + d*x)])) + 27*d^3*(b*c - a*d)^2*(a + b*x)^3*(2*A^2 - 2*A*B*n + B^2*n^2 +
2*B^2*Log[e*((a + b*x)/(c + d*x))^n]^2 + 2*B*n*(-2*A + B*n)*Log[(a + b*x)/
(c + d*x)] + 2*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 - 2*B*Log[e*((a + b*x)/(c
+ d*x))^n]*(-2*A + B*n + 2*B*n*Log[(a + b*x)/(c + d*x)])) + 54*b*d^3*(b*c
- a*d)*(a + b*x)^3*(c + d*x)*(8*A^2 - 18*A*B*n + 19*B^2*n^2 + 8*B^2*Log[e*(
a + b*x)/(c + d*x))^n]^2 + 2*B*n*(-8*A + 9*B*n)*Log[(a + b*x)/(c + d*x)] +
8*B^2*n^2*Log[(a + b*x)/(c + d*x)]^2 - 2*B*Log[e*((a + b*x)/(c + d*x))^n]*
(-8*A + 9*B*n + 8*B*n*Log[(a + b*x)/(c + d*x)])) + 6*B*(b*c - a*d)*n*Log[(a
+ b*x)/(c + d*x)]*(18*b*d^3*(a + b*x)^3*(c + d*x)*(8*A - 9*B*n + 8*B*Log[e
*((a + b*x)/(c + d*x))^n] - 8*B*n*Log[(a + b*x)/(c + d*x)])) + 4*b^2*(b*c -
a*d)^2*(c + d*x)^2*(3*A + B*n + 3*B*Log[e*((a + b*x)/(c + d*x))^n] - 3*B*n*
Log[(a + b*x)/(c + d*x)] + 9*d^3*(b*c - a*d)*(a + b*x)^3*(2*A - B*n + 2*B*
Log[e*((a + b*x)/(c + d*x))^n] - 2*B*n*Log[(a + b*x)/(c + d*x)]) - 3*b^2*d*
(b*c - a*d)*(a + b*x)*(c + d*x)^2*(18*A + 11*B*n + 18*B*(Log[e*((a + b*x)/
(c + d*x))^n] - n*Log[(a + b*x)/(c + d*x)])) + 6*b^2*d^2*(a + b*x)^2*(c + d
*x)^2*(36*A + 47*B*n + 36*B*(Log[e*((a + b*x)/(c + d*x))^n] - n*Log[(a + b*x
)/(c + d*x)])) - 60*b^2*d^3*(a + b*x)^3*(c + d*x)^2*(18*A^2 + 12*A*B*n + 4

```

$9*B^2*n^2 + 18*B^2*\text{Log}[e*((a + b*x)/(c + d*x))^n]^2 - 12*B*n*(3*A + B*n)*\text{Log}[(a + b*x)/(c + d*x)] + 18*B^2*n^2*\text{Log}[(a + b*x)/(c + d*x)]^2 + 12*B*\text{Log}[e*((a + b*x)/(c + d*x))^n]*(3*A + B*n - 3*B*n*\text{Log}[(a + b*x)/(c + d*x)])*\text{Log}[c + d*x]/(108*(b*c - a*d)^6*g^4*i^3*(a + b*x)^3*(c + d*x)^2)$

**Maple [F]** time = 0.727, size = 0, normalized size = 0.

$$\int \frac{1}{(bgx + ag)^4 (dix + ci)^3} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^4/(d\*i\*x+c\*i)^3,x)

[Out] int((A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^4/(d\*i\*x+c\*i)^3,x)

**Maxima [B]** time = 6.42509, size = 12546, normalized size = 13.82

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2/(b\*g\*x+a\*g)^4/(d\*i\*x+c\*i)^3,x, algorithm="maxima")

[Out]  $-1/6*B^2*((60*b^4*d^4*x^4 + 2*b^4*c^4 - 13*a*b^3*c^3*d + 47*a^2*b^2*c^2*d^2 + 27*a^3*b*c*d^3 - 3*a^4*d^4 + 30*(3*b^4*c*d^3 + 5*a*b^3*d^4)*x^3 + 10*(2*b^4*c^2*d^2 + 23*a*b^3*c*d^3 + 11*a^2*b^2*d^4)*x^2 - 5*(b^4*c^3*d - 11*a*b^3*c^2*d^2 - 35*a^2*b^2*c*d^3 - 3*a^3*b*d^4)*x)/((b^8*c^5*d^2 - 5*a*b^7*c^4*d^3 + 10*a^2*b^6*c^3*d^4 - 10*a^3*b^5*c^2*d^5 + 5*a^4*b^4*c*d^6 - a^5*b^3*d^7)*g^4*i^3*x^5 + (2*b^8*c^6*d - 7*a*b^7*c^5*d^2 + 5*a^2*b^6*c^4*d^3 + 10*a^3*b^5*c^3*d^4 - 20*a^4*b^4*c^2*d^5 + 13*a^5*b^3*c*d^6 - 3*a^6*b^2*d^7)*g^4*i^3*x^4 + (b^8*c^7 + a*b^7*c^6*d - 17*a^2*b^6*c^5*d^2 + 35*a^3*b^5*c^4*d^3 - 25*a^4*b^4*c^3*d^4 - a^5*b^3*c^2*d^5 + 9*a^6*b^2*c*d^6 - 3*a^7*b*d^7)*g^4*i^3*x^3 + (3*a*b^7*c^7 - 9*a^2*b^6*c^6*d + a^3*b^5*c^5*d^2 + 25*a^4*b^4*c^4*d^3 - 35*a^5*b^3*c^3*d^4 + 17*a^6*b^2*c^2*d^5 - a^7*b*c*d^6 - a^8*d^7)*g^4*i^3*x^2 + (3*a^2*b^6*c^7 - 13*a^3*b^5*c^6*d + 20*a^4*b^4*c^5*d^2 - 10*a^5*b^3*c^4*d^3 - 5*a^6*b^2*c^3*d^4 + 7*a^7*b*c^2*d^5 - 2*a^8*c*d^6)*g^4*i^3*x + (a^3*b^5*c^7 - 5*a^4*b^4*c^6*d + 10*a^5*b^3*c^5*d^2 - 10*a^6*b^2*c^4*d^$

$$\begin{aligned}
& 3 + 5a^7bc^3d^4 - a^8c^2d^5)g^4i^3) + 60b^2d^3\log(bx + a)/((b^6 \\
& *c^6 - 6a*b^5c^5d + 15a^2b^4c^4d^2 - 20a^3b^3c^3d^3 + 15a^4b^2 \\
& *c^2d^4 - 6a^5b*c*d^5 + a^6d^6)g^4i^3) - 60b^2d^3\log(dx + c)/((b^6 \\
& *c^6 - 6a*b^5c^5d + 15a^2b^4c^4d^2 - 20a^3b^3c^3d^3 + 15a^4b^2 \\
& *c^2d^4 - 6a^5b*c*d^5 + a^6d^6)g^4i^3))*\log(e*(bx/(dx + c) + a/(d* \\
& x + c))^n)^2 - 1/3A*B*((60b^4d^4x^4 + 2b^4c^4 - 13a*b^3c^3d + 47a \\
& ^2b^2c^2d^2 + 27a^3b*c*d^3 - 3a^4d^4 + 30*(3b^4c*d^3 + 5a*b^3d^4 \\
& )*x^3 + 10*(2b^4c^2d^2 + 23a*b^3c*d^3 + 11a^2b^2d^4)*x^2 - 5*(b^4c \\
& ^3d - 11a*b^3c^2d^2 - 35a^2b^2c*d^3 - 3a^3b*d^4)*x)/((b^8c^5d^2 \\
& - 5a*b^7c^4d^3 + 10a^2b^6c^3d^4 - 10a^3b^5c^2d^5 + 5a^4b^4c*d \\
& ^6 - a^5b^3d^7)g^4i^3*x^5 + (2b^8c^6d - 7a*b^7c^5d^2 + 5a^2b^6c \\
& ^4d^3 + 10a^3b^5c^3d^4 - 20a^4b^4c^2d^5 + 13a^5b^3c*d^6 - 3a^ \\
& 6b^2d^7)g^4i^3*x^4 + (b^8c^7 + a*b^7c^6d - 17a^2b^6c^5d^2 + 35a \\
& ^3b^5c^4d^3 - 25a^4b^4c^3d^4 - a^5b^3c^2d^5 + 9a^6b^2c*d^6 - 3 \\
& *a^7b*d^7)g^4i^3*x^3 + (3a*b^7c^7 - 9a^2b^6c^6d + a^3b^5c^5d^2 \\
& + 25a^4b^4c^4d^3 - 35a^5b^3c^3d^4 + 17a^6b^2c^2d^5 - a^7b*c*d^ \\
& 6 - a^8d^7)g^4i^3*x^2 + (3a^2b^6c^7 - 13a^3b^5c^6d + 20a^4b^4c \\
& ^5d^2 - 10a^5b^3c^4d^3 - 5a^6b^2c^3d^4 + 7a^7b*c^2d^5 - 2a^8c \\
& *d^6)g^4i^3*x + (a^3b^5c^7 - 5a^4b^4c^6d + 10a^5b^3c^5d^2 - 10 \\
& a^6b^2c^4d^3 + 5a^7b*c^3d^4 - a^8c^2d^5)g^4i^3) + 60b^2d^3\log( \\
& bx + a)/((b^6c^6 - 6a*b^5c^5d + 15a^2b^4c^4d^2 - 20a^3b^3c^3d^ \\
& 3 + 15a^4b^2c^2d^4 - 6a^5b*c*d^5 + a^6d^6)g^4i^3) - 60b^2d^3\log \\
& (dx + c)/((b^6c^6 - 6a*b^5c^5d + 15a^2b^4c^4d^2 - 20a^3b^3c^3d \\
& ^3 + 15a^4b^2c^2d^4 - 6a^5b*c*d^5 + a^6d^6)g^4i^3))*\log(e*(bx/(d* \\
& x + c) + a/(d*x + c))^n) - 1/108*((8b^5c^5 - 135a*b^4c^4d + 2160a^2b \\
& ^3c^3d^2 - 980a^3b^2c^2d^3 - 1080a^4b*c*d^4 + 27a^5d^5 + 2940*(b^ \\
& 5c*d^4 - a*b^4d^5)*x^4 + 30*(159b^5c^2d^3 + 74a*b^4c*d^4 - 233a^2b \\
& ^3d^5)*x^3 + 360*(b^5d^5*x^5 + a^3b^2c^2d^3 + (2b^5c*d^4 + 3a*b^4d \\
& ^5)*x^4 + (b^5c^2d^3 + 6a*b^4c*d^4 + 3a^2b^3d^5)*x^3 + (3a*b^4c^2* \\
& d^3 + 6a^2b^3c*d^4 + a^3b^2d^5)*x^2 + (3a^2b^3c^2d^3 + 2a^3b^2c \\
& *d^4)*x)*\log(bx + a)^3 - 360*(b^5d^5*x^5 + a^3b^2c^2d^3 + (2b^5c*d^4 \\
& + 3a*b^4d^5)*x^4 + (b^5c^2d^3 + 6a*b^4c*d^4 + 3a^2b^3d^5)*x^3 + ( \\
& 3a*b^4c^2d^3 + 6a^2b^3c*d^4 + a^3b^2d^5)*x^2 + (3a^2b^3c^2d^3 + \\
& 2a^3b^2c*d^4)*x)*\log(dx + c)^3 + 10*(170b^5c^3d^2 + 921a*b^4c^2d \\
& ^3 - 588a^2b^3c*d^4 - 503a^3b^2d^5)*x^2 - 360*(b^5d^5*x^5 + a^3b^2c \\
& ^2d^3 + (2b^5c*d^4 + 3a*b^4d^5)*x^4 + (b^5c^2d^3 + 6a*b^4c*d^4 + \\
& 3a^2b^3d^5)*x^3 + (3a*b^4c^2d^3 + 6a^2b^3c*d^4 + a^3b^2d^5)*x^2 \\
& + (3a^2b^3c^2d^3 + 2a^3b^2c*d^4)*x)*\log(bx + a)^2 - 360*(b^5d^5*x^ \\
& 5 + a^3b^2c^2d^3 + (2b^5c*d^4 + 3a*b^4d^5)*x^4 + (b^5c^2d^3 + 6a* \\
& b^4c*d^4 + 3a^2b^3d^5)*x^3 + (3a*b^4c^2d^3 + 6a^2b^3c*d^4 + a^3b \\
& ^2d^5)*x^2 + (3a^2b^3c^2d^3 + 2a^3b^2c*d^4)*x - 3*(b^5d^5*x^5 + a^ \\
& 3b^2c^2d^3 + (2b^5c*d^4 + 3a*b^4d^5)*x^4 + (b^5c^2d^3 + 6a*b^4c* \\
& d^4 + 3a^2b^3d^5)*x^3 + (3a*b^4c^2d^3 + 6a^2b^3c*d^4 + a^3b^2d^5 \\
& )*x^2 + (3a^2b^3c^2d^3 + 2a^3b^2c*d^4)*x)*\log(bx + a))*\log(dx + c) \\
& ^2 - 5*(19b^5c^4d - 756a*b^4c^3d^2 - 708a^2b^3c^2d^3 + 1256a^3b
\end{aligned}$$



$$\begin{aligned}
& ^2*c*d^4 + 189*a^4*b*d^5)*x + 2940*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*\log(b*x + a) - 60*(49*b^5*d^5*x^5 + 49*a^3*b^2*c^2*d^3 + 49*(2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + 49*(b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + 49*(3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + 18*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*\log(b*x + a)^2 + 49*(3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x - 12*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*\log(b*x + a)*\log(d*x + c))*n^2/(a^3*b^6*c^8*g^4*i^3 - 6*a^4*b^5*c^7*d*g^4*i^3 + 15*a^5*b^4*c^6*d^2*g^4*i^3 - 20*a^6*b^3*c^5*d^3*g^4*i^3 + 15*a^7*b^2*c^4*d^4*g^4*i^3 - 6*a^8*b*c^3*d^5*g^4*i^3 + a^9*c^2*d^6*g^4*i^3 + (b^9*c^6*d^2*g^4*i^3 - 6*a*b^8*c^5*d^3*g^4*i^3 + 15*a^2*b^7*c^4*d^4*g^4*i^3 - 20*a^3*b^6*c^3*d^5*g^4*i^3 + 15*a^4*b^5*c^2*d^6*g^4*i^3 - 6*a^5*b^4*c*d^7*g^4*i^3 + a^6*b^3*d^8*g^4*i^3)*x^5 + (2*b^9*c^7*d*g^4*i^3 - 9*a*b^8*c^6*d^2*g^4*i^3 + 12*a^2*b^7*c^5*d^3*g^4*i^3 + 5*a^3*b^6*c^4*d^4*g^4*i^3 - 30*a^4*b^5*c^3*d^5*g^4*i^3 + 33*a^5*b^4*c^2*d^6*g^4*i^3 - 16*a^6*b^3*c*d^7*g^4*i^3 + 3*a^7*b^2*d^8*g^4*i^3)*x^4 + (b^9*c^8*g^4*i^3 - 18*a^2*b^7*c^6*d^2*g^4*i^3 + 52*a^3*b^6*c^5*d^3*g^4*i^3 - 60*a^4*b^5*c^4*d^4*g^4*i^3 + 24*a^5*b^4*c^3*d^5*g^4*i^3 + 10*a^6*b^3*c^2*d^6*g^4*i^3 - 12*a^7*b^2*c*d^7*g^4*i^3 + 3*a^8*b*d^8*g^4*i^3)*x^3 + (3*a*b^8*c^8*g^4*i^3 - 12*a^2*b^7*c^7*d*g^4*i^3 + 10*a^3*b^6*c^6*d^2*g^4*i^3 + 24*a^4*b^5*c^5*d^3*g^4*i^3 - 60*a^5*b^4*c^4*d^4*g^4*i^3 + 52*a^6*b^3*c^3*d^5*g^4*i^3 - 18*a^7*b^2*c^2*d^6*g^4*i^3 + a^9*d^8*g^4*i^3)*x^2 + (3*a^2*b^7*c^8*g^4*i^3 - 16*a^3*b^6*c^7*d*g^4*i^3 + 33*a^4*b^5*c^6*d^2*g^4*i^3 - 30*a^5*b^4*c^5*d^3*g^4*i^3 + 5*a^6*b^3*c^4*d^4*g^4*i^3 + 12*a^7*b^2*c^3*d^5*g^4*i^3 - 9*a^8*b*c^2*d^6*g^4*i^3 + 2*a^9*c*d^7*g^4*i^3)*x) + 6*(4*b^5*c^5 - 45*a*b^4*c^4*d + 360*a^2*b^3*c^3*d^2 - 490*a^3*b^2*c^2*d^3 + 180*a^4*b*c*d^4 - 9*a^5*d^5 + 120*(b^5*c*d^4 - a*b^4*d^5)*x^4 + 120*(3*b^5*c^2*d^3 - 2*a*b^4*c*d^4 - a^2*b^3*d^5)*x^3 + 20*(11*b^5*c^3*d^2 + 21*a*b^4*c^2*d^3 - 39*a^2*b^3*c*d^4 + 7*a^3*b^2*d^5)*x^2 - 180*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*\log(b*x + a)^2 - 180*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*\log(d*x + c)^2 - 5*(5*b^5*c^4*d - 108*a*b^4*c^3*d^2 + 78*a^2*b^3*c^2*d^3 + 52*a^3*b^2*c*d^4 - 27*a^4*b*d^5)*x + 120*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*b^4*d^5)*x^4 + (b^5*c^2*d^3 + 6*a*b^4*c*d^4 + 3*a^2*b^3*d^5)*x^3 + (3*a*b^4*c^2*d^3 + 6*a^2*b^3*c*d^4 + a^3*b^2*d^5)*x^2 + (3*a^2*b^3*c^2*d^3 + 2*a^3*b^2*c*d^4)*x)*\log(b*x + a) - 120*(b^5*d^5*x^5 + a^3*b^2*c^2*d^3 + (2*b^5*c*d^4 + 3*a*
\end{aligned}$$

$$\begin{aligned}
& b^4 d^5) x^4 + (b^5 c^2 d^3 + 6 a b^4 c d^4 + 3 a^2 b^3 d^5) x^3 + (3 a b^4 c^2 d^3 + 6 a^2 b^3 c d^4 + a^3 b^2 d^5) x^2 + (3 a^2 b^3 c^2 d^3 + 2 a^3 b^2 c^2 d^4) x - 3 (b^5 d^5 x^5 + a^3 b^2 c^2 d^3 + (2 b^5 c d^4 + 3 a b^4 d^5) x^4 + (b^5 c^2 d^3 + 6 a b^4 c d^4 + 3 a^2 b^3 d^5) x^3 + (3 a b^4 c^2 d^3 + 6 a^2 b^3 c d^4 + a^3 b^2 d^5) x^2 + (3 a^2 b^3 c^2 d^3 + 2 a^3 b^2 c^2 d^4) x) \log(b x + a) \log(d x + c) \cdot n \log(e (b x / (d x + c) + a / (d x + c))^n) / (a^3 b^6 c^8 g^4 i^3 - 6 a^4 b^5 c^7 d g^4 i^3 + 15 a^5 b^4 c^6 d^2 g^4 i^3 - 20 a^6 b^3 c^5 d^3 g^4 i^3 + 15 a^7 b^2 c^4 d^4 g^4 i^3 - 6 a^8 b c^3 d^5 g^4 i^3 + a^9 c^2 d^6 g^4 i^3 + (b^9 c^6 d^2 g^4 i^3 - 6 a b^8 c^5 d^3 g^4 i^3 + 15 a^2 b^7 c^4 d^4 g^4 i^3 - 20 a^3 b^6 c^3 d^5 g^4 i^3 + 15 a^4 b^5 c^2 d^6 g^4 i^3 - 6 a^5 b^4 c^4 d^7 g^4 i^3 + a^6 b^3 d^8 g^4 i^3) x^5 + (2 b^9 c^7 d g^4 i^3 - 9 a b^8 c^6 d^2 g^4 i^3 + 12 a^2 b^7 c^5 d^3 g^4 i^3 + 5 a^3 b^6 c^4 d^4 g^4 i^3 - 30 a^4 b^5 c^3 d^5 g^4 i^3 + 33 a^5 b^4 c^2 d^6 g^4 i^3 - 16 a^6 b^3 c^4 d^7 g^4 i^3 + 3 a^7 b^2 d^8 g^4 i^3) x^4 + (b^9 c^8 g^4 i^3 - 18 a^2 b^7 c^6 d^2 g^4 i^3 + 52 a^3 b^6 c^5 d^3 g^4 i^3 - 60 a^4 b^5 c^4 d^4 g^4 i^3 + 24 a^5 b^4 c^3 d^5 g^4 i^3 + 10 a^6 b^3 c^2 d^6 g^4 i^3 - 12 a^7 b^2 c^4 d^7 g^4 i^3 + 3 a^8 b d^8 g^4 i^3) x^3 + (3 a b^8 c^8 g^4 i^3 - 12 a^2 b^7 c^7 d g^4 i^3 + 10 a^3 b^6 c^6 d^2 g^4 i^3 + 24 a^4 b^5 c^5 d^3 g^4 i^3 - 60 a^5 b^4 c^4 d^4 g^4 i^3 + 52 a^6 b^3 c^3 d^5 g^4 i^3 - 18 a^7 b^2 c^2 d^6 g^4 i^3 + a^9 d^8 g^4 i^3) x^2 + (3 a^2 b^7 c^8 g^4 i^3 - 16 a^3 b^6 c^7 d g^4 i^3 + 33 a^4 b^5 c^6 d^2 g^4 i^3 - 30 a^5 b^4 c^5 d^3 g^4 i^3 + 5 a^6 b^3 c^4 d^4 g^4 i^3 + 12 a^7 b^2 c^3 d^5 g^4 i^3 - 9 a^8 b c^2 d^6 g^4 i^3 + 2 a^9 c d^7 g^4 i^3) x) \cdot B^2 - 1/18 (4 b^5 c^5 - 45 a b^4 c^4 d + 360 a^2 b^3 c^3 d^2 - 490 a^3 b^2 c^2 d^3 + 180 a^4 b c d^4 - 9 a^5 d^5 + 120 (b^5 c d^4 - a b^4 d^5) x^4 + 120 (3 b^5 c^2 d^3 - 2 a b^4 c d^4 - a^2 b^3 d^5) x^3 + 20 (11 b^5 c^3 d^2 + 21 a b^4 c^2 d^3 - 39 a^2 b^3 c^2 d^4 + 7 a^3 b^2 d^5) x^2 - 180 (b^5 d^5 x^5 + a^3 b^2 c^2 d^3 + (2 b^5 c d^4 + 3 a b^4 d^5) x^4 + (b^5 c^2 d^3 + 6 a b^4 c d^4 + 3 a^2 b^3 d^5) x^3 + (3 a b^4 c^2 d^3 + 6 a^2 b^3 c d^4 + a^3 b^2 d^5) x^2 + (3 a^2 b^3 c^2 d^3 + 2 a^3 b^2 c^2 d^4) x) \log(b x + a)^2 - 180 (b^5 d^5 x^5 + a^3 b^2 c^2 d^3 + (2 b^5 c d^4 + 3 a b^4 d^5) x^4 + (b^5 c^2 d^3 + 6 a b^4 c d^4 + 3 a^2 b^3 d^5) x^3 + (3 a b^4 c^2 d^3 + 6 a^2 b^3 c d^4 + a^3 b^2 d^5) x^2 + (3 a^2 b^3 c^2 d^3 + 2 a^3 b^2 c^2 d^4) x) \log(d x + c)^2 - 5 (5 b^5 c^4 d - 108 a b^4 c^3 d^2 + 78 a^2 b^3 c^2 d^3 + 52 a^3 b^2 c^2 d^4 - 27 a^4 b d^5) x + 120 (b^5 d^5 x^5 + a^3 b^2 c^2 d^3 + (2 b^5 c d^4 + 3 a b^4 d^5) x^4 + (b^5 c^2 d^3 + 6 a b^4 c d^4 + 3 a^2 b^3 d^5) x^3 + (3 a b^4 c^2 d^3 + 6 a^2 b^3 c d^4 + a^3 b^2 d^5) x^2 + (3 a^2 b^3 c^2 d^3 + 2 a^3 b^2 c^2 d^4) x) \log(b x + a) - 120 (b^5 d^5 x^5 + a^3 b^2 c^2 d^3 + (2 b^5 c d^4 + 3 a b^4 d^5) x^4 + (b^5 c^2 d^3 + 6 a b^4 c d^4 + 3 a^2 b^3 d^5) x^3 + (3 a b^4 c^2 d^3 + 6 a^2 b^3 c d^4 + a^3 b^2 d^5) x^2 + (3 a^2 b^3 c^2 d^3 + 2 a^3 b^2 c^2 d^4) x) \log(b x + a) \log(d x + c) \cdot A \cdot B \cdot n / (a^3 b^6 c^8 g^4 i^3 - 6 a^4 b^5 c^7 d g^4 i^3 + 15 a^5 b^4 c^6 d^2 g^4 i^3 - 20 a^6 b^3 c^5 d^3 g^4 i^3 + 15 a^7 b^
\end{aligned}$$

$$\begin{aligned}
& b^2c^4d^4g^4i^3 - 6a^8b^3c^3d^5g^4i^3 + a^9c^2d^6g^4i^3 + (b^9c^6d^2g^4i^3 - 6a^8b^8c^5d^3g^4i^3 + 15a^2b^7c^4d^4g^4i^3 - 20 \\
& a^3b^6c^3d^5g^4i^3 + 15a^4b^5c^2d^6g^4i^3 - 6a^5b^4c^3d^7g^4i^3 + a^6b^3d^8g^4i^3)x^5 + (2b^9c^7d^2g^4i^3 - 9a^8b^8c^6d^2g^4i^3 + 12a^2b^7c^5d^3g^4i^3 + 5a^3b^6c^4d^4g^4i^3 - 30a^4b^5 \\
& c^3d^5g^4i^3 + 33a^5b^4c^2d^6g^4i^3 - 16a^6b^3c^3d^7g^4i^3 + 3a^7b^2d^8g^4i^3)x^4 + (b^9c^8g^4i^3 - 18a^2b^7c^6d^2g^4i^3 + 52a^3b^6c^5d^3g^4i^3 - 60a^4b^5c^4d^4g^4i^3 + 24a^5b^4c^3d^5g^4i^3 + 10a^6b^3c^2d^6g^4i^3 - 12a^7b^2c^3d^7g^4i^3 + 3a^8 \\
& b^1d^8g^4i^3)x^3 + (3a^8b^8c^8g^4i^3 - 12a^2b^7c^7d^2g^4i^3 + 10a^3b^6c^6d^2g^4i^3 + 24a^4b^5c^5d^3g^4i^3 - 60a^5b^4c^4d^4g^4i^3 + 52a^6b^3c^3d^5g^4i^3 - 18a^7b^2c^2d^6g^4i^3 + a^9d^8g^4i^3)x^2 + (3a^2b^7c^8g^4i^3 - 16a^3b^6c^7d^2g^4i^3 + 33a^4b^5c^6d^2g^4i^3 - 30a^5b^4c^5d^3g^4i^3 + 5a^6b^3c^4d^4g^4i^3 + 12a^7b^2c^3d^5g^4i^3 - 9a^8b^3c^2d^6g^4i^3 + 2a^9c^2d^7g^4i^3)x) - 1/6A^2((60b^4d^4x^4 + 2b^4c^4 - 13ab^3c^3d + 47a^2b^2c^2d^2 + 27a^3b^3cd^3 - 3a^4d^4 + 30(3b^4cd^3 + 5ab^3d^4))x^3 + 10(2b^4c^2d^2 + 23ab^3cd^3 + 11a^2b^2d^4)x^2 - 5(b^4c^3d - 11ab^3c^2d^2 - 35a^2b^2cd^3 - 3a^3bd^4)x)/((b^8c^5d^2 - 5ab^7c^4d^3 + 10a^2b^6c^3d^4 - 10a^3b^5c^2d^5 + 5a^4b^4cd^6 - a^5b^3d^7)g^4i^3x^5 + (2b^8c^6d - 7ab^7c^5d^2 + 5a^2b^6c^4d^3 + 10a^3b^5c^3d^4 - 20a^4b^4c^2d^5 + 13a^5b^3cd^6 - 3a^6b^2d^7)g^4i^3x^4 + (b^8c^7 + ab^7c^6d - 17a^2b^6c^5d^2 + 35a^3b^5c^4d^3 - 25a^4b^4c^3d^4 - a^5b^3c^2d^5 + 9a^6b^2cd^6 - 3a^7bd^7)g^4i^3x^3 + (3ab^7c^7 - 9a^2b^6c^6d + a^3b^5c^5d^2 + 25a^4b^4c^4d^3 - 35a^5b^3c^3d^4 + 17a^6b^2c^2d^5 - a^7b^3cd^6 - a^8d^7)g^4i^3x^2 + (3a^2b^6c^7 - 13a^3b^5c^6d + 20a^4b^4c^5d^2 - 10a^5b^3c^4d^3 - 5a^6b^2c^3d^4 + 7a^7b^3c^2d^5 - 2a^8cd^6)g^4i^3x + (a^3b^5c^7 - 5a^4b^4c^6d + 10a^5b^3c^5d^2 - 10a^6b^2c^4d^3 + 5a^7b^3c^3d^4 - a^8c^2d^5)g^4i^3) + 60b^2d^3log(bx + a)/((b^6c^6 - 6ab^5c^5d + 15a^2b^4c^4d^2 - 20a^3b^3c^3d^3 + 15a^4b^2c^2d^4 - 6a^5b^3cd^5 + a^6d^6)g^4i^3) - 60b^2d^3log(dx + c)/((b^6c^6 - 6ab^5c^5d + 15a^2b^4c^4d^2 - 20a^3b^3c^3d^3 + 15a^4b^2c^2d^4 - 6a^5b^3cd^5 + a^6d^6)g^4i^3))
\end{aligned}$$

**Fricas [B]** time = 1.04947, size = 9756, normalized size = 10.74

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*((b\*x+a)/(d\*x+c)))^n))^2/(b\*g\*x+a\*g)^4/(d\*i\*x+c\*i)^3,x,  
algorithm="fricas")

[Out] 
$$\begin{aligned}
& -1/108*(36*A^2*b^5*c^5 - 270*A^2*a*b^4*c^4*d + 1080*A^2*a^2*b^3*c^3*d^2 - 3 \\
& 60*A^2*a^3*b^2*c^2*d^3 - 540*A^2*a^4*b*c*d^4 + 54*A^2*a^5*d^5 + 60*(18*A^2* \\
& b^5*c*d^4 - 18*A^2*a*b^4*d^5 + 49*(B^2*b^5*c*d^4 - B^2*a*b^4*d^5)*n^2 + 12* \\
& (A*B*b^5*c*d^4 - A*B*a*b^4*d^5)*n)*x^4 + 30*(54*A^2*b^5*c^2*d^3 + 36*A^2*a* \\
& b^4*c*d^4 - 90*A^2*a^2*b^3*d^5 + (159*B^2*b^5*c^2*d^3 + 74*B^2*a*b^4*c*d^4 \\
& - 233*B^2*a^2*b^3*d^5)*n^2 + 24*(3*A*B*b^5*c^2*d^3 - 2*A*B*a*b^4*c*d^4 - A* \\
& B*a^2*b^3*d^5)*n)*x^3 + 360*(B^2*b^5*d^5*n^2*x^5 + B^2*a^3*b^2*c^2*d^3*n^2 \\
& + (2*B^2*b^5*c*d^4 + 3*B^2*a*b^4*d^5)*n^2*x^4 + (B^2*b^5*c^2*d^3 + 6*B^2*a* \\
& b^4*c*d^4 + 3*B^2*a^2*b^3*d^5)*n^2*x^3 + (3*B^2*a*b^4*c^2*d^3 + 6*B^2*a^2*b^ \\
& ^3*c*d^4 + B^2*a^3*b^2*d^5)*n^2*x^2 + (3*B^2*a^2*b^3*c^2*d^3 + 2*B^2*a^3*b^ \\
& ^2*c*d^4)*n^2*x)*\log((b*x + a)/(d*x + c))^3 + (8*B^2*b^5*c^5 - 135*B^2*a*b^4 \\
& *c^4*d + 2160*B^2*a^2*b^3*c^3*d^2 - 980*B^2*a^3*b^2*c^2*d^3 - 1080*B^2*a^4* \\
& b*c*d^4 + 27*B^2*a^5*d^5)*n^2 + 10*(36*A^2*b^5*c^3*d^2 + 378*A^2*a*b^4*c^2* \\
& d^3 - 216*A^2*a^2*b^3*c*d^4 - 198*A^2*a^3*b^2*d^5 + (170*B^2*b^5*c^3*d^2 + \\
& 921*B^2*a*b^4*c^2*d^3 - 588*B^2*a^2*b^3*c*d^4 - 503*B^2*a^3*b^2*d^5)*n^2 + \\
& 12*(11*A*B*b^5*c^3*d^2 + 21*A*B*a*b^4*c^2*d^3 - 39*A*B*a^2*b^3*c*d^4 + 7*A* \\
& B*a^3*b^2*d^5)*n)*x^2 + 18*(2*B^2*b^5*c^5 - 15*B^2*a*b^4*c^4*d + 60*B^2*a^2 \\
& *b^3*c^3*d^2 - 20*B^2*a^3*b^2*c^2*d^3 - 30*B^2*a^4*b*c*d^4 + 3*B^2*a^5*d^5 \\
& + 60*(B^2*b^5*c*d^4 - B^2*a*b^4*d^5)*x^4 + 30*(3*B^2*b^5*c^2*d^3 + 2*B^2*a* \\
& b^4*c*d^4 - 5*B^2*a^2*b^3*d^5)*x^3 + 10*(2*B^2*b^5*c^3*d^2 + 21*B^2*a*b^4*c \\
& ^2*d^3 - 12*B^2*a^2*b^3*c*d^4 - 11*B^2*a^3*b^2*d^5)*x^2 - 5*(B^2*b^5*c^4*d \\
& - 12*B^2*a*b^4*c^3*d^2 - 24*B^2*a^2*b^3*c^2*d^3 + 32*B^2*a^3*b^2*c*d^4 + 3* \\
& B^2*a^4*b*d^5)*x + 60*(B^2*b^5*d^5*x^5 + B^2*a^3*b^2*c^2*d^3 + (2*B^2*b^5*c \\
& *d^4 + 3*B^2*a*b^4*d^5)*x^4 + (B^2*b^5*c^2*d^3 + 6*B^2*a*b^4*c*d^4 + 3*B^2* \\
& a^2*b^3*d^5)*x^3 + (3*B^2*a*b^4*c^2*d^3 + 6*B^2*a^2*b^3*c*d^4 + B^2*a^3*b^2 \\
& *d^5)*x^2 + (3*B^2*a^2*b^3*c^2*d^3 + 2*B^2*a^3*b^2*c*d^4)*x)*\log((b*x + a)/ \\
& (d*x + c))*\log(e)^2 + 18*(60*A*B*a^3*b^2*c^2*d^3*n + 20*(B^2*b^5*d^5*n^2 + \\
& 3*A*B*b^5*d^5*n)*x^5 + 20*(5*B^2*b^5*c*d^4*n^2 + 3*(2*A*B*b^5*c*d^4 + 3*A* \\
& B*a*b^4*d^5)*n)*x^4 + 10*((11*B^2*b^5*c^2*d^3 + 18*B^2*a*b^4*c*d^4 - 9*B^2* \\
& a^2*b^3*d^5)*n^2 + 6*(A*B*b^5*c^2*d^3 + 6*A*B*a*b^4*c*d^4 + 3*A*B*a^2*b^3*d \\
& ^5)*n)*x^3 + (2*B^2*b^5*c^5 - 15*B^2*a*b^4*c^4*d + 60*B^2*a^2*b^3*c^3*d^2 - \\
& 30*B^2*a^4*b*c*d^4 + 3*B^2*a^5*d^5)*n^2 + 10*((2*B^2*b^5*c^3*d^2 + 27*B^2* \\
& a*b^4*c^2*d^3 - 9*B^2*a^3*b^2*d^5)*n^2 + 6*(3*A*B*a*b^4*c^2*d^3 + 6*A*B*a^2 \\
& *b^3*c*d^4 + A*B*a^3*b^2*d^5)*n)*x^2 - 5*((B^2*b^5*c^4*d - 12*B^2*a*b^4*c^3 \\
& *d^2 - 36*B^2*a^2*b^3*c^2*d^3 + 24*B^2*a^3*b^2*c*d^4 + 3*B^2*a^4*b*d^5)*n^2 \\
& - 12*(3*A*B*a^2*b^3*c^2*d^3 + 2*A*B*a^3*b^2*c*d^4)*n)*x)*\log((b*x + a)/(d* \\
& x + c))^2 + 6*(4*A*B*b^5*c^5 - 45*A*B*a*b^4*c^4*d + 360*A*B*a^2*b^3*c^3*d^2 \\
& - 490*A*B*a^3*b^2*c^2*d^3 + 180*A*B*a^4*b*c*d^4 - 9*A*B*a^5*d^5)*n - 5*(18 \\
& *A^2*b^5*c^4*d - 216*A^2*a*b^4*c^3*d^2 - 432*A^2*a^2*b^3*c^2*d^3 + 576*A^2* \\
& a^3*b^2*c*d^4 + 54*A^2*a^4*b*d^5 + (19*B^2*b^5*c^4*d - 756*B^2*a*b^4*c^3*d^ \\
& ^2 - 708*B^2*a^2*b^3*c^2*d^3 + 1256*B^2*a^3*b^2*c*d^4 + 189*B^2*a^4*b*d^5)*n \\
& ^2 + 6*(5*A*B*b^5*c^4*d - 108*A*B*a*b^4*c^3*d^2 + 78*A*B*a^2*b^3*c^2*d^3 + \\
& 52*A*B*a^3*b^2*c*d^4 - 27*A*B*a^4*b*d^5)*n)*x + 6*(12*A*B*b^5*c^5 - 90*A*B*
\end{aligned}$$

$$\begin{aligned}
& a*b^4*c^4*d + 360*A*B*a^2*b^3*c^3*d^2 - 120*A*B*a^3*b^2*c^2*d^3 - 180*A*B*a^4*b*c*d^4 + 18*A*B*a^5*d^5 + 120*(3*A*B*b^5*c*d^4 - 3*A*B*a*b^4*d^5 + (B^2*b^5*c*d^4 - B^2*a*b^4*d^5)*n)*x^4 + 60*(9*A*B*b^5*c^2*d^3 + 6*A*B*a*b^4*c*d^4 - 15*A*B*a^2*b^3*d^5 + 2*(3*B^2*b^5*c^2*d^3 - 2*B^2*a*b^4*c*d^4 - B^2*a^2*b^3*d^5)*n)*x^3 + 20*(6*A*B*b^5*c^3*d^2 + 63*A*B*a*b^4*c^2*d^3 - 36*A*B*a^2*b^3*c*d^4 - 33*A*B*a^3*b^2*d^5 + (11*B^2*b^5*c^3*d^2 + 21*B^2*a*b^4*c^2*d^3 - 39*B^2*a^2*b^3*c*d^4 + 7*B^2*a^3*b^2*d^5)*n)*x^2 + 180*(B^2*b^5*d^5*n*x^5 + B^2*a^3*b^2*c^2*d^3*n + (2*B^2*b^5*c*d^4 + 3*B^2*a*b^4*d^5)*n*x^4 + (B^2*b^5*c^2*d^3 + 6*B^2*a*b^4*c*d^4 + 3*B^2*a^2*b^3*d^5)*n*x^3 + (3*B^2*a*b^4*c^2*d^3 + 6*B^2*a^2*b^3*c*d^4 + B^2*a^3*b^2*d^5)*n*x^2 + (3*B^2*a^2*b^3*c^2*d^3 + 2*B^2*a^3*b^2*c*d^4)*n*x)*log((b*x + a)/(d*x + c))^2 + (4*B^2*b^5*c^5 - 45*B^2*a*b^4*c^4*d + 360*B^2*a^2*b^3*c^3*d^2 - 490*B^2*a^3*b^2*c^2*d^3 + 180*B^2*a^4*b*c*d^4 - 9*B^2*a^5*d^5)*n - 5*(6*A*B*b^5*c^4*d - 72*A*B*a*b^4*c^3*d^2 - 144*A*B*a^2*b^3*c^2*d^3 + 192*A*B*a^3*b^2*c*d^4 + 18*A*B*a^4*b*d^5 + (5*B^2*b^5*c^4*d - 108*B^2*a*b^4*c^3*d^2 + 78*B^2*a^2*b^3*c^2*d^3 + 52*B^2*a^3*b^2*c*d^4 - 27*B^2*a^4*b*d^5)*n)*x + 6*(60*A*B*a^3*b^2*c^2*d^3 + 20*(B^2*b^5*d^5*n + 3*A*B*b^5*d^5)*x^5 + 20*(5*B^2*b^5*c*d^4*n + 6*A*B*b^5*c*d^4 + 9*A*B*a*b^4*d^5)*x^4 + 10*(6*A*B*b^5*c^2*d^3 + 36*A*B*a*b^4*c*d^4 + 18*A*B*a^2*b^3*d^5 + (11*B^2*b^5*c^2*d^3 + 18*B^2*a*b^4*c*d^4 - 9*B^2*a^2*b^3*d^5)*n)*x^3 + 10*(18*A*B*a*b^4*c^2*d^3 + 36*A*B*a^2*b^3*c*d^4 + 6*A*B*a^3*b^2*d^5 + (2*B^2*b^5*c^3*d^2 + 27*B^2*a*b^4*c^2*d^3 - 9*B^2*a^3*b^2*d^5)*n)*x^2 + (2*B^2*b^5*c^5 - 15*B^2*a*b^4*c^4*d + 60*B^2*a^2*b^3*c^3*d^2 - 30*B^2*a^4*b*c*d^4 + 3*B^2*a^5*d^5)*n + 5*(36*A*B*a^2*b^3*c^2*d^3 + 24*A*B*a^3*b^2*c*d^4 - (B^2*b^5*c^4*d - 12*B^2*a*b^4*c^3*d^2 - 36*B^2*a^2*b^3*c^2*d^3 + 24*B^2*a^3*b^2*c*d^4 + 3*B^2*a^4*b*d^5)*n)*x)*log((b*x + a)/(d*x + c))*log(e) + 6*(180*A^2*a^3*b^2*c^2*d^3 + 10*(49*B^2*b^5*d^5*n^2 + 12*A*B*b^5*d^5*n + 18*A^2*b^5*d^5)*x^5 + 10*(60*A*B*b^5*c*d^4*n + 36*A^2*b^5*c*d^4 + 54*A^2*a*b^4*d^5 + 5*(22*B^2*b^5*c*d^4 + 27*B^2*a*b^4*d^5)*n^2)*x^4 + 10*(18*A^2*b^5*c^2*d^3 + 108*A^2*a*b^4*c*d^4 + 54*A^2*a^2*b^3*d^5 + 5*(17*B^2*b^5*c^2*d^3 + 54*B^2*a*b^4*c*d^4 + 27*B^2*a^2*b^3*d^5)*n^2 + 6*(11*A*B*b^5*c^2*d^3 + 18*A*B*a*b^4*c*d^4 - 9*A*B*a^2*b^3*d^5)*n)*x^3 + (4*B^2*b^5*c^5 - 45*B^2*a*b^4*c^4*d + 360*B^2*a^2*b^3*c^3*d^2 + 180*B^2*a^4*b*c*d^4 - 9*B^2*a^5*d^5)*n^2 + 10*(54*A^2*a*b^4*c^2*d^3 + 108*A^2*a^2*b^3*c*d^4 + 18*A^2*a^3*b^2*d^5 + (22*B^2*b^5*c^3*d^2 + 189*B^2*a*b^4*c^2*d^3 + 216*B^2*a^2*b^3*c*d^4 + 63*B^2*a^3*b^2*d^5)*n^2 + 6*(2*A*B*b^5*c^3*d^2 + 27*A*B*a*b^4*c^2*d^3 - 9*A*B*a^3*b^2*d^5)*n)*x^2 + 6*(2*A*B*b^5*c^5 - 15*A*B*a*b^4*c^4*d + 60*A*B*a^2*b^3*c^3*d^2 - 30*A*B*a^4*b*c*d^4 + 3*A*B*a^5*d^5)*n + 5*(108*A^2*a^2*b^3*c^2*d^3 + 72*A^2*a^3*b^2*c*d^4 - (5*B^2*b^5*c^4*d - 108*B^2*a*b^4*c^3*d^2 - 216*B^2*a^2*b^3*c^2*d^3 - 144*B^2*a^3*b^2*c*d^4 - 27*B^2*a^4*b*d^5)*n^2 - 6*(A*B*b^5*c^4*d - 12*A*B*a*b^4*c^3*d^2 - 36*A*B*a^2*b^3*c^2*d^3 + 24*A*B*a^3*b^2*c*d^4 + 3*A*B*a^4*b*d^5)*n)*x)*log((b*x + a)/(d*x + c)))/((b^9*c^6*d^2 - 6*a*b^8*c^5*d^3 + 15*a^2*b^7*c^4*d^4 - 20*a^3*b^6*c^3*d^5 + 15*a^4*b^5*c^2*d^6 - 6*a^5*b^4*c*d^7 + a^6*b^3*d^8)*g^4*i^3*x^5 + (2*b^9*c^7*d - 9*a*b^8*c^6*d^2 + 12*a^2*b^7*c^5*d^3 + 5*a^3*b^6*c^4*d^4 - 30*a^4*b^5*c^3*d^5 + 33*a^5*b^4*c^2*d^6 - 16*a^6*b^3*c*d^7 + 3*a^7*b^2*d^8)*g^4*i^3*x^
\end{aligned}$$

$$4 + (b^9c^8 - 18a^2b^7c^6d^2 + 52a^3b^6c^5d^3 - 60a^4b^5c^4d^4 + 24a^5b^4c^3d^5 + 10a^6b^3c^2d^6 - 12a^7b^2c^1d^7 + 3a^8b^1d^8) * g^4i^3x^3 + (3ab^8c^8 - 12a^2b^7c^7d + 10a^3b^6c^6d^2 + 24a^4b^5c^5d^3 - 60a^5b^4c^4d^4 + 52a^6b^3c^3d^5 - 18a^7b^2c^2d^6 + a^9d^8) * g^4i^3x^2 + (3a^2b^7c^8 - 16a^3b^6c^7d + 33a^4b^5c^6d^2 - 30a^5b^4c^5d^3 + 5a^6b^3c^4d^4 + 12a^7b^2c^3d^5 - 9a^8b^1c^2d^6 + 2a^9c^1d^7) * g^4i^3x + (a^3b^6c^8 - 6a^4b^5c^7d + 15a^5b^4c^6d^2 - 20a^6b^3c^5d^3 + 15a^7b^2c^4d^4 - 6a^8b^1c^3d^5 + a^9c^2d^6) * g^4i^3$$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**4/(d*i*x+c*i)**3, x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2}{(bgx + ag)^4 (dix + ci)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4/(d*i*x+c*i)^3, x, algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/((b*g*x + a*g)^4*(d*i*x + c*i)^3), x)
```

$$3.210 \quad \int (ag + bgx)^m (ci + dix)^{-2-m} \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^p dx$$

**Optimal.** Leaf size=189

$$(a + bx)e^{-\frac{A(m+1)}{Bn}} (g(a + bx))^m (i(c + dx))^{-m} \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)^{-\frac{m+1}{n}} \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)^p \left( -\frac{(m+1) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{Bn} \right)^{-p} \text{Gamma}$$


---


$$i^2(m+1)(c+dx)(bc-ad)$$

[Out] ((a + b\*x)\*(g\*(a + b\*x))^m\*Gamma[1 + p, -(((1 + m)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(B\*n))]\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^p)/((b\*c - a\*d)\*E^((A\*(1 + m))/(B\*n))\*i^(2\*(1 + m))\*(e\*((a + b\*x)/(c + d\*x))^n)^((1 + m)/n)\*(c + d\*x)\*(i\*(c + d\*x))^m\*(-(((1 + m)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/(B\*n))))^p)

**Rubi [F]** time = 0.975122, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.$ , Rules used = {}

$$\int (ag + bgx)^m (ci + dix)^{-2-m} \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^p dx$$

Verification is Not applicable to the result.

[In] Int[(a\*g + b\*g\*x)^m\*(c\*i + d\*i\*x)^(-2 - m)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^p,x]

[Out] Defer[Int] [(a\*g + b\*g\*x)^m\*(c\*i + d\*i\*x)^(-2 - m)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^p, x]

Rubi steps

$$\int (210c + 210dx)^{-2-m} (ag + bgx)^m \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^p dx = \int (210c + 210dx)^{-2-m} (ag + bgx)^m \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^p dx$$

**Mathematica [F]** time = 0.537676, size = 0, normalized size = 0.

$$\int (ag + bgx)^m (ci + dix)^{-2-m} \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^p dx$$

Verification is Not applicable to the result.

[In] Integrate[(a\*g + b\*g\*x)^m\*(c\*i + d\*i\*x)^(-2 - m)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^p,x]

[Out] Integrate[(a\*g + b\*g\*x)^m\*(c\*i + d\*i\*x)^(-2 - m)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^p, x]

**Maple [F]** time = 3.169, size = 0, normalized size = 0.

$$\int (bgx + ag)^m (dix + ci)^{-2-m} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^m\*(d\*i\*x+c\*i)^(-2-m)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^p,x)

[Out] int((b\*g\*x+a\*g)^m\*(d\*i\*x+c\*i)^(-2-m)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^p,x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$\int (bgx + ag)^m (dix + ci)^{-m-2} \left( B \log \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) + A \right)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^m\*(d\*i\*x+c\*i)^(-2-m)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^p,x, algorithm="maxima")

[Out] integrate((b\*g\*x + a\*g)^m\*(d\*i\*x + c\*i)^(-m - 2)\*(B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)^p, x)

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( (bgx + ag)^m (dix + ci)^{-m-2} \left( B \log \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) + A \right)^p, x \right)$$



Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^p,x, algorithm="fricas")
```

```
[Out] integral((b*g*x + a*g)^m*(d*i*x + c*i)^(-m - 2)*(B*log(e*((b*x + a)/(d*x +
c))^n) + A)^p, x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**m*(d*i*x+c*i)**(-2-m)*(A+B*ln(e*((b*x+a)/(d*x+c))**n
))**p,x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int (bgx + ag)^m (dix + ci)^{-m-2} \left( B \log \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) + A \right)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^p,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^m*(d*i*x + c*i)^(-m - 2)*(B*log(e*((b*x + a)/(d*x +
c))^n) + A)^p, x)
```

$$3.211 \quad \int (ag+bgx)^{-2-m}(ci+dix)^m \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^p dx$$

**Optimal.** Leaf size=190

$$(a+bx)e^{\frac{A(m+1)}{Bn}}(g(a+bx))^{-m-2}(i(c+dx))^{m+2} \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)^{\frac{m+1}{n}} \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)^p \left( \frac{(m+1) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{Bn} \right)^{-p} \text{Gamma}$$


---


$$i^2(m+1)(c+dx)(bc-ad)$$

[Out] -((E^((A\*(1+m))/(B\*n))\*(a+b\*x)\*(g\*(a+b\*x))^(2+m)\*(e\*((a+b\*x)/(c+d\*x))^n))^((1+m)/n)\*(i\*(c+d\*x))^(2+m)\*Gamma[1+p, ((1+m)\*(A+B\*Log[e\*((a+b\*x)/(c+d\*x))^n])^p)/((b\*c-a\*d)\*i^2\*(1+m)\*(c+d\*x)\*(((1+m)\*(A+B\*Log[e\*((a+b\*x)/(c+d\*x))^n])^p)/(B\*n)))]/(B\*n)^p)

**Rubi [F]** time = 0.884281, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.$ , Rules used = {}

$$\int (ag+bgx)^{-2-m}(ci+dix)^m \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^p dx$$

Verification is Not applicable to the result.

[In] Int[(a\*g + b\*g\*x)^(-2 - m)\*(c\*i + d\*i\*x)^m\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^p, x]

[Out] Defer[Int][(a\*g + b\*g\*x)^(-2 - m)\*(c\*i + d\*i\*x)^m\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^p, x]

Rubi steps

$$\int (211c + 211dx)^m (ag + bgx)^{-2-m} \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^p dx = \int (211c + 211dx)^m (ag + bgx)^{-2-m} \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^p dx$$

**Mathematica [F]** time = 0.507904, size = 0, normalized size = 0.

$$\int (ag+bgx)^{-2-m}(ci+dix)^m \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^p dx$$

Verification is Not applicable to the result.

[In] Integrate[(a\*g + b\*g\*x)^(-2 - m)\*(c\*i + d\*i\*x)^m\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^p,x]

[Out] Integrate[(a\*g + b\*g\*x)^(-2 - m)\*(c\*i + d\*i\*x)^m\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^p, x]

**Maple [F]** time = 2.14, size = 0, normalized size = 0.

$$\int (bgx + ag)^{-2-m} (dix + ci)^m \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^(-2-m)\*(d\*i\*x+c\*i)^m\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^p,x)

[Out] int((b\*g\*x+a\*g)^(-2-m)\*(d\*i\*x+c\*i)^m\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^p,x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$\int (bgx + ag)^{-m-2} (dix + ci)^m \left( B \log \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) + A \right)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^(-2-m)\*(d\*i\*x+c\*i)^m\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^p,x, algorithm="maxima")

[Out] integrate((b\*g\*x + a\*g)^(-m - 2)\*(d\*i\*x + c\*i)^m\*(B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)^p, x)

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( (bgx + ag)^{-m-2} (dix + ci)^m \left( B \log \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) + A \right)^p, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^p,x, algorithm="fricas")
```

```
[Out] integral((b*g*x + a*g)^(-m - 2)*(d*i*x + c*i)^m*(B*log(e*((b*x + a)/(d*x +
c))^n) + A)^p, x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**(-2-m)*(d*i*x+c*i)**m*(A+B*ln(e*((b*x+a)/(d*x+c))**n
))**p,x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int (bgx + ag)^{-m-2} (dix + ci)^m \left( B \log \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) + A \right)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n))
^p,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^(-m - 2)*(d*i*x + c*i)^m*(B*log(e*((b*x + a)/(d*x +
c))^n) + A)^p, x)
```

$$3.212 \quad \int (ag+bgx)^m (ci+dix)^{-2-m} \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^3 dx$$

**Optimal.** Leaf size=292

$$\frac{6B^2n^2(a+bx)(g(a+bx))^m(i(c+dx))^{-m} \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{i^2(m+1)^3(c+dx)(bc-ad)} + \frac{(a+bx)(g(a+bx))^m(i(c+dx))^{-m} \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{i^2(m+1)(c+dx)(bc-ad)}$$

[Out]  $(-6*B^3*n^3*(a+b*x)*(g*(a+b*x))^m)/((b*c-a*d)*i^{2*(1+m)}*(c+d*x)*(i*(c+d*x))^m) + (6*B^2*n^2*(a+b*x)*(g*(a+b*x))^m*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/((b*c-a*d)*i^{2*(1+m)}*(c+d*x)*(i*(c+d*x))^m) - (3*B*n*(a+b*x)*(g*(a+b*x))^m*(A+B*Log[e*((a+b*x)/(c+d*x))^n])^2)/((b*c-a*d)*i^{2*(1+m)}*(c+d*x)*(i*(c+d*x))^m) + ((a+b*x)*(g*(a+b*x))^m*(A+B*Log[e*((a+b*x)/(c+d*x))^n])^3)/((b*c-a*d)*i^{2*(1+m)}*(c+d*x)*(i*(c+d*x))^m)$

**Rubi [F]** time = 1.97695, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.$ , Rules used = {}

$$\int (ag+bgx)^m (ci+dix)^{-2-m} \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^3 dx$$

Verification is Not applicable to the result.

[In] Int[(a\*g + b\*g\*x)^m\*(c\*i + d\*i\*x)^(-2 - m)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^3, x]

[Out]  $(A^3*(a*g + b*g*x)^{(1+m)}*(c*i + d*i*x)^{(-1-m)})/((b*c - a*d)*g*i*(1+m)) - (3*A^2*B*n*(a*g + b*g*x)^{(1+m)}*(c*i + d*i*x)^{(-1-m)})/((b*c - a*d)*g*i*(1+m)^2) + (3*A^2*B*(a*g + b*g*x)^{(1+m)}*(c*i + d*i*x)^{(-1-m)}*Log[e*((a + b*x)/(c + d*x))^n])/((b*c - a*d)*g*i*(1+m)) + 3*A*B^2*Defer[Int] [(a*g + b*g*x)^m*(c*i + d*i*x)^{(-2 - m)}*Log[e*((a + b*x)/(c + d*x))^n]^2, x] + B^3*Defer[Int] [(a*g + b*g*x)^m*(c*i + d*i*x)^{(-2 - m)}*Log[e*((a + b*x)/(c + d*x))^n]^3, x]$

Rubi steps

$$\begin{aligned}
\int (212c + 212dx)^{-2-m} (ag + bgx)^m \left( A + B \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) \right)^3 dx &= \int \left( A^3 (212c + 212dx)^{-2-m} (ag + bgx)^m + 3A^2 B (212c + 212dx)^{-2-m} (ag + bgx)^m \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) \right. \\
&= A^3 \int (212c + 212dx)^{-2-m} (ag + bgx)^m dx + (3A^2 B) \int (212c + 212dx)^{-2-m} (ag + bgx)^m \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) dx \\
&= \frac{A^3 (212c + 212dx)^{-1-m} (ag + bgx)^{1+m}}{212(bc - ad)g(1 + m)} + \frac{3A^2 B (212c + 212dx)^{-1-m} (ag + bgx)^{1+m}}{212(bc - ad)g(1 + m)} \\
&= \frac{A^3 (212c + 212dx)^{-1-m} (ag + bgx)^{1+m}}{212(bc - ad)g(1 + m)} + \frac{3A^2 B (212c + 212dx)^{-1-m} (ag + bgx)^{1+m}}{212(bc - ad)g(1 + m)} \\
&= -\frac{3 \cdot 212^{-2-m} A^2 B n (c + dx)^{-1-m} (ag + bgx)^{1+m}}{(bc - ad)g(1 + m)^2} + \frac{A^3 (212c + 212dx)^{-1-m} (ag + bgx)^{1+m}}{(bc - ad)g(1 + m)^2}
\end{aligned}$$

**Mathematica [A]** time = 7.57979, size = 206, normalized size = 0.71

$$\frac{(a + bx)(g(a + bx))^m (i(c + dx))^{-m-1} \left( 3B(m + 1) \left( A^2(m + 1)^2 - 2AB(m + 1)n + 2B^2n^2 \right) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + 3B^2(m + 1)^2 (A^2(m + 1)^2 - 2AB(m + 1)n + 2B^2n^2) \right)}{i(m + 1)^4}$$

Antiderivative was successfully verified.

[In] Integrate[(a\*g + b\*g\*x)^m\*(c\*i + d\*i\*x)^(-2 - m)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^3,x]

[Out] ((a + b\*x)\*(g\*(a + b\*x))^m\*(i\*(c + d\*x))^(1 - m)\*(A^3\*(1 + m)^3 - 3\*A^2\*B\*(1 + m)^2\*n + 6\*A\*B^2\*(1 + m)\*n^2 - 6\*B^3\*n^3 + 3\*B\*(1 + m)\*(A^2\*(1 + m)^2 - 2\*A\*B\*(1 + m)\*n + 2\*B^2\*n^2)\*Log[e\*((a + b\*x)/(c + d\*x))^n] + 3\*B^2\*(1 + m)^2\*(A + A\*m - B\*n)\*Log[e\*((a + b\*x)/(c + d\*x))^n]^2 + B^3\*(1 + m)^3\*Log[e\*((a + b\*x)/(c + d\*x))^n]^3)/((b\*c - a\*d)\*i\*(1 + m)^4)

**Maple [F]** time = 5.497, size = 0, normalized size = 0.

$$\int (bgx + ag)^m (dix + ci)^{-2-m} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^3 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^3,x)`

[Out] `int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^3,x)`

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$\int \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^3 (bgx+ag)^m (dix+ci)^{-m-2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^3,x, algorithm="maxima")`

[Out] `integrate((B*log(e*((b*x+a)/(d*x+c))^n)+A)^3*(b*g*x+a*g)^m*(d*i*x+c*i)^(-m-2),x)`

**Fricas [B]** time = 0.82571, size = 5800, normalized size = 19.86

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^3,x, algorithm="fricas")`

[Out] `(A^3*a*c*m^3 - 6*B^3*a*c*n^3 + 3*A^3*a*c*m^2 + 3*A^3*a*c*m + A^3*a*c + (B^3*a*c*m^3 + 3*B^3*a*c*m^2 + 3*B^3*a*c*m + B^3*a*c + (B^3*b*d*m^3 + 3*B^3*b*d*m^2 + 3*B^3*b*d*m + B^3*b*d)*x^2 + (B^3*b*c + B^3*a*d + (B^3*b*c + B^3*a*d)*m^3 + 3*(B^3*b*c + B^3*a*d)*m^2 + 3*(B^3*b*c + B^3*a*d)*m)*x)*log(e)^3 + ((B^3*b*d*m^3 + 3*B^3*b*d*m^2 + 3*B^3*b*d*m + B^3*b*d)*n^3*x^2 + (B^3*b*c + B^3*a*d + (B^3*b*c + B^3*a*d)*m^3 + 3*(B^3*b*c + B^3*a*d)*m^2 + 3*(B^3*b*c + B^3*a*d)*m)*n^3*x + (B^3*a*c*m^3 + 3*B^3*a*c*m^2 + 3*B^3*a*c*m + B^3*a*c)*n^3)*log((b*x+a)/(d*x+c))^3 + 6*(A*B^2*a*c*m + A*B^2*a*c)*n^2 + (A^3*b*d*m^3 - 6*B^3*b*d*n^3 + 3*A^3*b*d*m^2 + 3*A^3*b*d*m + A^3*b*d + 6*(A*B^2*b*d*m + A*B^2*b*d)*n^2 - 3*(A^2*B*b*d*m^2 + 2*A^2*B*b*d*m + A^2*B*b*d)*n)*x^2 + 3*(A*B^2*a*c*m^3 + 3*A*B^2*a*c*m^2 + 3*A*B^2*a*c*m + A*B^2*a*c + (A*B^2*b*d*m^3 + 3*A*B^2*b*d*m^2 + 3*A*B^2*b*d*m + A*B^2*b*d - (B^3*b*d*m^2 + 2*B^3*b*d*m + B^3*b*d)*n)*x^2 - (B^3*a*c*m^2 + 2*B^3*a*c*m + B^3*a*c)*n + (A*`

$$\begin{aligned}
& B^2*b*c + A*B^2*a*d + (A*B^2*b*c + A*B^2*a*d)*m^3 + 3*(A*B^2*b*c + A*B^2*a*d)*m^2 + 3*(A*B^2*b*c + A*B^2*a*d)*m - (B^3*b*c + B^3*a*d + (B^3*b*c + B^3*a*d)*m^2 + 2*(B^3*b*c + B^3*a*d)*m)*n*x + ((B^3*b*d*m^3 + 3*B^3*b*d*m^2 + 3*B^3*b*d*m + B^3*b*d)*n*x^2 + (B^3*b*c + B^3*a*d + (B^3*b*c + B^3*a*d)*m^3 + 3*(B^3*b*c + B^3*a*d)*m^2 + 3*(B^3*b*c + B^3*a*d)*m)*n*x + (B^3*a*c*m^3 + 3*B^3*a*c*m^2 + 3*B^3*a*c*m + B^3*a*c)*n)*\log((b*x + a)/(d*x + c))*\log(e)^2 - 3*((B^3*a*c*m^2 + 2*B^3*a*c*m + B^3*a*c)*n^3 - (A*B^2*a*c*m^3 + 3*A*B^2*a*c*m^2 + 3*A*B^2*a*c*m + A*B^2*a*c)*n^2 + ((B^3*b*d*m^2 + 2*B^3*b*d*m + B^3*b*d)*n^3 - (A*B^2*b*d*m^3 + 3*A*B^2*b*d*m^2 + 3*A*B^2*b*d*m + A*B^2*b*d)*n^2)*x^2 + ((B^3*b*c + B^3*a*d + (B^3*b*c + B^3*a*d)*m^2 + 2*(B^3*b*c + B^3*a*d)*m)*n^3 - (A*B^2*b*c + A*B^2*a*d + (A*B^2*b*c + A*B^2*a*d)*m^3 + 3*(A*B^2*b*c + A*B^2*a*d)*m^2 + 3*(A*B^2*b*c + A*B^2*a*d)*m)*n^2)*x*\log((b*x + a)/(d*x + c))^2 - 3*(A^2*B*a*c*m^2 + 2*A^2*B*a*c*m + A^2*B*a*c)*n + (A^3*b*c + A^3*a*d + (A^3*b*c + A^3*a*d)*m^3 - 6*(B^3*b*c + B^3*a*d)*n^3 + 3*(A^3*b*c + A^3*a*d)*m^2 + 6*(A*B^2*b*c + A*B^2*a*d + (A*B^2*b*c + A*B^2*a*d)*m)*n^2 + 3*(A^3*b*c + A^3*a*d)*m - 3*(A^2*B*b*c + A^2*B*a*d + (A^2*B*b*c + A^2*B*a*d)*m^2 + 2*(A^2*B*b*c + A^2*B*a*d)*m)*n)*x + 3*(A^2*B*a*c*m^3 + 3*A^2*B*a*c*m^2 + 3*A^2*B*a*c*m + A^2*B*a*c + 2*(B^3*a*c*m + B^3*a*c)*n^2 + (A^2*B*b*d*m^3 + 3*A^2*B*b*d*m^2 + 3*A^2*B*b*d*m + A^2*B*b*d + 2*(B^3*b*d*m + B^3*b*d)*n^2 - 2*(A*B^2*b*d*m^2 + 2*A*B^2*b*d*m + A*B^2*b*d)*n)*x^2 + ((B^3*b*d*m^3 + 3*B^3*b*d*m^2 + 3*B^3*b*d*m + B^3*b*d)*n^2*x^2 + (B^3*b*c + B^3*a*d + (B^3*b*c + B^3*a*d)*m^3 + 3*(B^3*b*c + B^3*a*d)*m^2 + 3*(B^3*b*c + B^3*a*d)*m)*n^2*x + (B^3*a*c*m^3 + 3*B^3*a*c*m^2 + 3*B^3*a*c*m + B^3*a*c)*n^2)*\log((b*x + a)/(d*x + c))^2 - 2*(A*B^2*a*c*m^2 + 2*A*B^2*a*c*m + A*B^2*a*c)*n + (A^2*B*b*c + A^2*B*a*d + (A^2*B*b*c + A^2*B*a*d)*m^3 + 3*(A^2*B*b*c + A^2*B*a*d)*m^2 + 2*(B^3*b*c + B^3*a*d + (B^3*b*c + B^3*a*d)*m)*n^2 + 3*(A^2*B*b*c + A^2*B*a*d)*m - 2*(A*B^2*b*c + A*B^2*a*d + (A*B^2*b*c + A*B^2*a*d)*m^2 + 2*(A*B^2*b*c + A*B^2*a*d)*m)*n)*x - 2*((B^3*a*c*m^2 + 2*B^3*a*c*m + B^3*a*c)*n^2 + ((B^3*b*d*m^2 + 2*B^3*b*d*m + B^3*b*d)*n^2 - (A*B^2*b*d*m^3 + 3*A*B^2*b*d*m^2 + 3*A*B^2*b*d*m + A*B^2*b*d)*n)*x^2 - (A*B^2*a*c*m^3 + 3*A*B^2*a*c*m^2 + 3*A*B^2*a*c*m + A*B^2*a*c)*n + ((B^3*b*c + B^3*a*d + (B^3*b*c + B^3*a*d)*m^2 + 2*(B^3*b*c + B^3*a*d)*m)*n^2 - (A*B^2*b*c + A*B^2*a*d + (A*B^2*b*c + A*B^2*a*d)*m^3 + 3*(A*B^2*b*c + A*B^2*a*d)*m^2 + 3*(A*B^2*b*c + A*B^2*a*d)*m)*n)*x*\log((b*x + a)/(d*x + c))*\log(e) + 3*(2*(B^3*a*c*m + B^3*a*c)*n^3 - 2*(A*B^2*a*c*m^2 + 2*A*B^2*a*c*m + A*B^2*a*c)*n^2 + (2*(B^3*b*d*m + B^3*b*d)*n^3 - 2*(A*B^2*b*d*m^2 + 2*A*B^2*b*d*m + A*B^2*b*d)*n^2 + (A^2*B*b*d*m^3 + 3*A^2*B*b*d*m^2 + 3*A^2*B*b*d*m + A^2*B*b*d)*n)*x^2 + (A^2*B*a*c*m^3 + 3*A^2*B*a*c*m^2 + 3*A^2*B*a*c*m + A^2*B*a*c)*n + (2*(B^3*b*c + B^3*a*d + (B^3*b*c + B^3*a*d)*m)*n^3 - 2*(A*B^2*b*c + A*B^2*a*d + (A*B^2*b*c + A*B^2*a*d)*m^3 + 3*(A*B^2*b*c + A*B^2*a*d)*m^2 + 2*(A*B^2*b*c + A*B^2*a*d)*m)*n^2 + (A^2*B*b*c + A^2*B*a*d + (A^2*B*b*c + A^2*B*a*d)*m^3 + 3*(A^2*B*b*c + A^2*B*a*d)*m^2 + 3*(A^2*B*b*c + A^2*B*a*d)*m)*n)*x*\log((b*x + a)/(d*x + c))*(b*g*x + a*g)^m*e^{-(m+2)*\log(b*g*x + a*g) + (m+2)*\log((b*x + a)/(d*x + c)) - (m+2)*\log(i/g))/((b*c - a*d)*m^4 + 4*(b*c - a*d)*m^3 + 6*(b*c - a*d)*m^2 + b*c - a*d + 4*(b*c - a*d)*m)
\end{aligned}$$



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**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*\*m\*(d\*i\*x+c\*i)\*\*(-2-m)\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n))\*\*3,x)

[Out] Timed out

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^3 (bgx+ag)^m (dix+ci)^{-m-2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^m\*(d\*i\*x+c\*i)^(-2-m)\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^3,x, algorithm="giac")

[Out] integrate((B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)^3\*(b\*g\*x + a\*g)^m\*(d\*i\*x + c\*i)^(-m - 2), x)

$$3.213 \quad \int (ag+bgx)^m (ci+dix)^{-2-m} \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx$$

**Optimal.** Leaf size=210

$$\frac{(a+bx)(g(a+bx))^m(i(c+dx))^{-m} \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)^2}{i^2(m+1)(c+dx)(bc-ad)} - \frac{2Bn(a+bx)(g(a+bx))^m(i(c+dx))^{-m} \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)}{i^2(m+1)^2(c+dx)(bc-ad)}$$

[Out] (2\*B^2\*n^2\*(a+b\*x)\*(g\*(a+b\*x))^m)/((b\*c-a\*d)\*i^2\*(1+m)^3\*(c+d\*x)\*(i\*(c+d\*x))^m) - (2\*B\*n\*(a+b\*x)\*(g\*(a+b\*x))^m\*(A+B\*Log[e\*((a+b\*x)/(c+d\*x))^n]))/((b\*c-a\*d)\*i^2\*(1+m)^2\*(c+d\*x)\*(i\*(c+d\*x))^m) + ((a+b\*x)\*(g\*(a+b\*x))^m\*(A+B\*Log[e\*((a+b\*x)/(c+d\*x))^n])^2)/((b\*c-a\*d)\*i^2\*(1+m)\*(c+d\*x)\*(i\*(c+d\*x))^m)

**Rubi [F]** time = 1.21513, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.$ , Rules used = {}

$$\int (ag+bgx)^m (ci+dix)^{-2-m} \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx$$

Verification is Not applicable to the result.

[In] Int[(a\*g + b\*g\*x)^m\*(c\*i + d\*i\*x)^(-2 - m)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2,x]

[Out] (A^2\*(a\*g + b\*g\*x)^(1 + m)\*(c\*i + d\*i\*x)^(-1 - m))/((b\*c - a\*d)\*g\*i\*(1 + m)) - (2\*A\*B\*n\*(a\*g + b\*g\*x)^(1 + m)\*(c\*i + d\*i\*x)^(-1 - m))/((b\*c - a\*d)\*g\*i\*(1 + m)^2) + (2\*A\*B\*(a\*g + b\*g\*x)^(1 + m)\*(c\*i + d\*i\*x)^(-1 - m)\*Log[e\*((a + b\*x)/(c + d\*x))^n])/((b\*c - a\*d)\*g\*i\*(1 + m)) + B^2\*Defer[Int][(a\*g + b\*g\*x)^m\*(c\*i + d\*i\*x)^(-2 - m)\*Log[e\*((a + b\*x)/(c + d\*x))^n]^2, x]

Rubi steps

$$\begin{aligned}
\int (213c + 213dx)^{-2-m} (ag + bgx)^m \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx &= \int \left( A^2 (213c + 213dx)^{-2-m} (ag + bgx)^m + 2AB(213c + 213dx)^{-2-m} (ag + bgx)^m \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + B^2 (213c + 213dx)^{-2-m} (ag + bgx)^m \log^2 \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx \\
&= A^2 \int (213c + 213dx)^{-2-m} (ag + bgx)^m dx + (2AB) \int (213c + 213dx)^{-2-m} (ag + bgx)^m \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) dx + B^2 \int (213c + 213dx)^{-2-m} (ag + bgx)^m \log^2 \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) dx \\
&= \frac{A^2 (213c + 213dx)^{-1-m} (ag + bgx)^{1+m}}{213(bc - ad)g(1 + m)} + \frac{2AB(213c + 213dx)^{-1-m} (ag + bgx)^{1+m}}{213(bc - ad)g(1 + m)} \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + \frac{B^2 (213c + 213dx)^{-1-m} (ag + bgx)^{1+m}}{213(bc - ad)g(1 + m)} \log^2 \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + \frac{A^2 (213c + 213dx)^{-2-m} (ag + bgx)^m}{(bc - ad)g(1 + m)^2} \\
&= -\frac{2 \cdot 213^{-2-m} ABn (c + dx)^{-1-m} (ag + bgx)^{1+m}}{(bc - ad)g(1 + m)^2} + \frac{A^2 (213c + 213dx)^{-2-m} (ag + bgx)^m}{(bc - ad)g(1 + m)^2}
\end{aligned}$$

**Mathematica [A]** time = 2.07189, size = 134, normalized size = 0.64

$$\frac{(a + bx)(g(a + bx))^m (i(c + dx))^{-m-1} \left( 2B(m + 1)(Am + A - Bn) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + B^2(m + 1)^2 \log^2 \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A^2(m + 1) \right)}{i(m + 1)^3 (bc - ad)}$$

Antiderivative was successfully verified.

[In] Integrate[(a\*g + b\*g\*x)^m\*(c\*i + d\*i\*x)^(-2 - m)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2,x]

[Out] ((a + b\*x)\*(g\*(a + b\*x))^m\*(i\*(c + d\*x))^(-1 - m)\*(A^2\*(1 + m)^2 - 2\*A\*B\*(1 + m)\*n + 2\*B^2\*n^2 + 2\*B\*(1 + m)\*(A + A\*m - B\*n)\*Log[e\*((a + b\*x)/(c + d\*x))^n] + B^2\*(1 + m)^2\*Log[e\*((a + b\*x)/(c + d\*x))^n]^2))/((b\*c - a\*d)\*i\*(1 + m)^3)

**Maple [F]** time = 4.484, size = 0, normalized size = 0.

$$\int (bgx + ag)^m (dix + ci)^{-2-m} \left( A + B \ln \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)`

[Out] `int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)`

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$\int \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2 (bgx+ag)^m (dix+ci)^{-m-2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="maxima")`

[Out] `integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2*(b*g*x + a*g)^m*(d*i*x + c*i)^(-m - 2), x)`

**Fricas [B]** time = 0.651262, size = 2201, normalized size = 10.48

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fricas")`

[Out]  $(A^2*a*c*m^2 + 2*B^2*a*c*n^2 + 2*A^2*a*c*m + A^2*a*c + (A^2*b*d*m^2 + 2*B^2*b*d*n^2 + 2*A^2*b*d*m + A^2*b*d - 2*(A*B*b*d*m + A*B*b*d)*n)*x^2 + (B^2*a*c*m^2 + 2*B^2*a*c*m + B^2*a*c + (B^2*b*d*m^2 + 2*B^2*b*d*m + B^2*b*d)*x^2 + (B^2*b*c + B^2*a*d + (B^2*b*c + B^2*a*d)*m^2 + 2*(B^2*b*c + B^2*a*d)*m)*x)*\log(e)^2 + ((B^2*b*d*m^2 + 2*B^2*b*d*m + B^2*b*d)*n^2*x^2 + (B^2*b*c + B^2*a*d + (B^2*b*c + B^2*a*d)*m^2 + 2*(B^2*b*c + B^2*a*d)*m)*n^2*x + (B^2*a*c*m^2 + 2*B^2*a*c*m + B^2*a*c)*n^2)*\log((b*x + a)/(d*x + c))^2 - 2*(A*B*a*c*m + A*B*a*c)*n + (A^2*b*c + A^2*a*d + (A^2*b*c + A^2*a*d)*m^2 + 2*(B^2*b*c + B^2*a*d)*n^2 + 2*(A^2*b*c + A^2*a*d)*m - 2*(A*B*b*c + A*B*a*d + (A*B*b*c + A*B*a*d)*m)*n)*x + 2*(A*B*a*c*m^2 + 2*A*B*a*c*m + A*B*a*c + (A*B*b*d*m^2 + 2*A*B*b*d*m + A*B*b*d - (B^2*b*d*m + B^2*b*d)*n)*x^2 - (B^2*a*c*m + B^2*a*c)*n + (A*B*b*c + A*B*a*d + (A*B*b*c + A*B*a*d)*m^2 + 2*(A*B*b*c + A*B*a*d)*m - (B^2*b*c + B^2*a*d + (B^2*b*c + B^2*a*d)*m)*n)*x + ((B^2*b*d*m^2 + 2*B$

$$\begin{aligned} &^2*b*d*m + B^2*b*d)*n*x^2 + (B^2*b*c + B^2*a*d + (B^2*b*c + B^2*a*d)*m^2 + \\ &2*(B^2*b*c + B^2*a*d)*m)*n*x + (B^2*a*c*m^2 + 2*B^2*a*c*m + B^2*a*c)*n)*\log \\ &((b*x + a)/(d*x + c))*\log(e) - 2*((B^2*a*c*m + B^2*a*c)*n^2 + ((B^2*b*d*m \\ &+ B^2*b*d)*n^2 - (A*B*b*d*m^2 + 2*A*B*b*d*m + A*B*b*d)*n)*x^2 - (A*B*a*c*m^ \\ &2 + 2*A*B*a*c*m + A*B*a*c)*n + ((B^2*b*c + B^2*a*d + (B^2*b*c + B^2*a*d)*m) \\ &*n^2 - (A*B*b*c + A*B*a*d + (A*B*b*c + A*B*a*d)*m^2 + 2*(A*B*b*c + A*B*a*d) \\ &*m)*n)*x)*\log((b*x + a)/(d*x + c))*(b*g*x + a*g)^m*e^{-(m + 2)*\log(b*g*x + \\ &a*g) + (m + 2)*\log((b*x + a)/(d*x + c)) - (m + 2)*\log(i/g))/((b*c - a*d)*m \\ &^3 + 3*(b*c - a*d)*m^2 + b*c - a*d + 3*(b*c - a*d)*m) \end{aligned}$$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**m*(d*i*x+c*i)**(-2-m)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2 (bgx+ag)^m (dix+ci)^{-m-2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2*(b*g*x + a*g)^m*(d*i*x + c*i)^(-m - 2), x)
```

$$3.214 \quad \int (ag+bgx)^m (ci+dix)^{-2-m} \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx$$

**Optimal.** Leaf size=128

$$\frac{(a+bx)(g(a+bx))^m(i(c+dx))^{-m} \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{i^2(m+1)(c+dx)(bc-ad)} - \frac{Bn(a+bx)(g(a+bx))^m(i(c+dx))^{-m}}{i^2(m+1)^2(c+dx)(bc-ad)}$$

[Out] -((B\*n\*(a + b\*x)\*(g\*(a + b\*x))^m)/((b\*c - a\*d)\*i^2\*(1 + m)^2\*(c + d\*x)\*(i\*(c + d\*x))^m)) + ((a + b\*x)\*(g\*(a + b\*x))^m\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))/((b\*c - a\*d)\*i^2\*(1 + m)\*(c + d\*x)\*(i\*(c + d\*x))^m)

**Rubi [A]** time = 0.615875, antiderivative size = 168, normalized size of antiderivative = 1.31, number of steps used = 6, number of rules used = 4, integrand size = 47,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.085$ , Rules used = {6742, 37, 2554, 12}

$$\frac{A(ag+bgx)^{m+1}(ci+dix)^{-m-1}}{gi(m+1)(bc-ad)} + \frac{B(ag+bgx)^{m+1}(ci+dix)^{-m-1} \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{gi(m+1)(bc-ad)} - \frac{Bn(ag+bgx)^{m+1}(ci+dix)^{-m-1}}{gi(m+1)^2(bc-ad)}$$

Antiderivative was successfully verified.

[In] Int[(a\*g + b\*g\*x)^m\*(c\*i + d\*i\*x)^(-2 - m)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]),x]

[Out] (A\*(a\*g + b\*g\*x)^(1 + m)\*(c\*i + d\*i\*x)^(-1 - m))/((b\*c - a\*d)\*g\*i\*(1 + m)) - (B\*n\*(a\*g + b\*g\*x)^(1 + m)\*(c\*i + d\*i\*x)^(-1 - m))/((b\*c - a\*d)\*g\*i\*(1 + m)^2) + (B\*(a\*g + b\*g\*x)^(1 + m)\*(c\*i + d\*i\*x)^(-1 - m)\*Log[e\*((a + b\*x)/(c + d\*x))^n])/((b\*c - a\*d)\*g\*i\*(1 + m))

### Rule 6742

Int[u\_, x\_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]

### Rule 37

Int[((a\_.) + (b\_.)\*(x\_))^(m\_.)\*((c\_.) + (d\_.)\*(x\_))^(n\_), x\_Symbol] := Simp[[(a + b\*x)^(m + 1)\*(c + d\*x)^(n + 1)]/((b\*c - a\*d)\*(m + 1)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b\*c - a\*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -

1]

Rule 2554

```
Int[Log[u_]*(v_), x_Symbol] := With[{w = IntHide[v, x]}, Dist[Log[u], w, x]
- Int[SimplifyIntegrand[(w*D[u, x])/u, x], x] /; InverseFunctionFreeQ[w, x]
]] /; InverseFunctionFreeQ[u, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rubi steps

$$\begin{aligned}
\int (214c + 214dx)^{-2-m} (ag + bgx)^m \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx &= \int \left( A(214c + 214dx)^{-2-m} (ag + bgx)^m + B(214c + 214dx)^{-2-m} (ag + bgx)^m \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx \\
&= A \int (214c + 214dx)^{-2-m} (ag + bgx)^m dx + B \int (214c + 214dx)^{-2-m} (ag + bgx)^m \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) dx \\
&= \frac{A(214c + 214dx)^{-1-m} (ag + bgx)^{1+m}}{214(bc - ad)g(1+m)} + \frac{B(214c + 214dx)^{-1-m} (ag + bgx)^{1+m} \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{214(bc - ad)g(1+m)} \\
&= \frac{A(214c + 214dx)^{-1-m} (ag + bgx)^{1+m}}{214(bc - ad)g(1+m)} + \frac{B(214c + 214dx)^{-1-m} (ag + bgx)^{1+m} \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{214(bc - ad)g(1+m)} \\
&= -\frac{214^{-2-m} Bn(c + dx)^{-1-m} (ag + bgx)^{1+m}}{(bc - ad)g(1+m)^2} + \frac{A(214c + 214dx)^{-1-m} (ag + bgx)^{1+m}}{214(bc - ad)g(1+m)}
\end{aligned}$$

**Mathematica [A]** time = 0.522248, size = 78, normalized size = 0.61

$$\frac{(a + bx)(g(a + bx))^m (c + dx)^{-m-1} \left( B(m + 1) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + Am + A - Bn \right)}{i(m + 1)^2 (bc - ad)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^m*(c+i + d*i*x)^(-2 - m)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

[Out]  $((a + b*x)*(g*(a + b*x))^m*(i*(c + d*x))^{(-1 - m)*(A + A*m - B*n + B*(1 + m))}*\text{Log}[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)*i*(1 + m)^2)$

**Maple [F]** time = 4.637, size = 0, normalized size = 0.

$$\int (bgx + ag)^m (dix + ci)^{-2-m} \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)`

[Out] `int((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)`

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$\int \left( B \log \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) + A \right) (bgx + ag)^m (dix + ci)^{-m-2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxima")`

[Out] `integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)*(b*g*x + a*g)^m*(d*i*x + c*i)^(-m - 2), x)`

**Fricas [B]** time = 0.573072, size = 647, normalized size = 5.05

$$\left( Aacm - Bacn + Aac + (Abdm - Bbdn + Abd)x^2 + (Abc + Aad + (Abc + Aad)m - (Bbc + Bad)n)x + (Bacm + Bac + (B$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fricas")`



```
[Out] (A*a*c*m - B*a*c*n + A*a*c + (A*b*d*m - B*b*d*n + A*b*d)*x^2 + (A*b*c + A*a*d + (A*b*c + A*a*d)*m - (B*b*c + B*a*d)*n)*x + (B*a*c*m + B*a*c + (B*b*d*m + B*b*d)*x^2 + (B*b*c + B*a*d + (B*b*c + B*a*d)*m)*x)*log(e) + ((B*b*d*m + B*b*d)*n*x^2 + (B*b*c + B*a*d + (B*b*c + B*a*d)*m)*n*x + (B*a*c*m + B*a*c)*n)*log((b*x + a)/(d*x + c))*(b*g*x + a*g)^m*e^(-(m + 2)*log(b*g*x + a*g) + (m + 2)*log((b*x + a)/(d*x + c)) - (m + 2)*log(i/g))/((b*c - a*d)*m^2 + b*c - a*d + 2*(b*c - a*d)*m)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**m*(d*i*x+c*i)**(-2-m)*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right) (bgx+ag)^m (dix+ci)^{-m-2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)*(b*g*x + a*g)^m*(d*i*x + c*i)^(-m - 2), x)
```

$$3.215 \quad \int \frac{(ag+bgx)^m (ci+dix)^{-2-m}}{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx$$

**Optimal.** Leaf size=125

$$\frac{(a+bx)e^{-\frac{A(m+1)}{Bn}} (g(a+bx))^m (i(c+dx))^{-m} \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-\frac{m+1}{n}} \operatorname{Ei}\left(\frac{(m+1)\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{B^2 n(c+dx)(bc-ad)}$$

[Out] ((a + b\*x)\*(g\*(a + b\*x))^m\*ExpIntegralEi[((1 + m)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])/(B\*n))]/(B\*(b\*c - a\*d)\*E^((A\*(1 + m))/(B\*n))\*i^2\*n\*(e\*((a + b\*x)/(c + d\*x))^n)^((1 + m)/n)\*(c + d\*x)\*(i\*(c + d\*x))^m)

**Rubi [F]** time = 0.736634, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.$ , Rules used = {}

$$\int \frac{(ag + bgx)^m (ci + dix)^{-2-m}}{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx$$

Verification is Not applicable to the result.

[In] Int[((a\*g + b\*g\*x)^m\*(c\*i + d\*i\*x)^(-2 - m))/(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]), x]

[Out] Defer[Int][[(a\*g + b\*g\*x)^m\*(c\*i + d\*i\*x)^(-2 - m))/(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]), x]

Rubi steps

$$\int \frac{(215c + 215dx)^{-2-m} (ag + bgx)^m}{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx = \int \frac{(215c + 215dx)^{-2-m} (ag + bgx)^m}{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx$$

**Mathematica [F]** time = 0.231827, size = 0, normalized size = 0.

$$\int \frac{(ag + bgx)^m (ci + dix)^{-2-m}}{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx$$

Verification is Not applicable to the result.

[In] Integrate[((a\*g + b\*g\*x)^m\*(c\*i + d\*i\*x)^(-2 - m))/(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]),x]

[Out] Integrate[((a\*g + b\*g\*x)^m\*(c\*i + d\*i\*x)^(-2 - m))/(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]), x]

**Maple [F]** time = 2.954, size = 0, normalized size = 0.

$$\int (bgx + ag)^m (dix + ci)^{-2-m} \left( A + B \ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) \right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^m\*(d\*i\*x+c\*i)^(-2-m)/(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n)),x)

[Out] int((b\*g\*x+a\*g)^m\*(d\*i\*x+c\*i)^(-2-m)/(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n)),x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^m (dix + ci)^{-m-2}}{B \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^m\*(d\*i\*x+c\*i)^(-2-m)/(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n)),x, algorithm="maxima")

[Out] integrate((b\*g\*x + a\*g)^m\*(d\*i\*x + c\*i)^(-m - 2)/(B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A), x)

---

**Fricas [A]** time = 0.496147, size = 227, normalized size = 1.82

$$\frac{\operatorname{Ei}\left(\frac{(Bm+B)n \log\left(\frac{bx+a}{dx+c}\right) + Am + (Bm+B) \log(e) + A}{Bn}\right) e^{\left(-\frac{(Bm+2B)n \log\left(\frac{i}{g}\right) + Am + (Bm+B) \log(e) + A}{Bn}\right)}}{(Bbc - Bad)g^{2n}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^m\*(d\*i\*x+c\*i)^(-2-m)/(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n)),x, algorithm="fricas")

[Out] Ei(((B\*m + B)\*n\*log((b\*x + a)/(d\*x + c)) + A\*m + (B\*m + B)\*log(e) + A)/(B\*n)) \* e^(-((B\*m + 2\*B)\*n\*log(i/g) + A\*m + (B\*m + B)\*log(e) + A)/(B\*n)) / ((B\*b\*c - B\*a\*d)\*g^2\*n)

---

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*\*m\*(d\*i\*x+c\*i)\*\*(-2-m)/(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n)),x)

[Out] Timed out

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^m (dix + ci)^{-m-2}}{B \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^m\*(d\*i\*x+c\*i)^(-2-m)/(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n)),x, algorithm="giac")

```
[Out] integrate((b*g*x + a*g)^m*(d*i*x + c*i)^(-m - 2)/(B*log(e*((b*x + a)/(d*x + c))^n) + A), x)
```

$$3.216 \quad \int \frac{(ag+bgx)^m (ci+dix)^{-2-m}}{\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2} dx$$

**Optimal.** Leaf size=206

$$\frac{(m+1)(a+bx)e^{-\frac{A(m+1)}{Bn}}(g(a+bx))^m(i(c+dx))^{-m}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-\frac{m+1}{n}} \operatorname{Ei}\left(\frac{(m+1)\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{B^2 i^2 n^2 (c+dx)(bc-ad)} - \frac{(a+bx)(g(a+bx))}{Bi^2 n(c+dx)(bc-ad)} \left(B\right)$$

[Out] ((1 + m)\*(a + b\*x)\*(g\*(a + b\*x))^m\*ExpIntegralEi[((1 + m)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])/(B\*n))]/(B^2\*(b\*c - a\*d)\*E^((A\*(1 + m))/(B\*n))\*i^2\*n^2\*(e\*((a + b\*x)/(c + d\*x))^n)^((1 + m)/n)\*(c + d\*x)\*(i\*(c + d\*x))^m) - ((a + b\*x)\*(g\*(a + b\*x))^m)/(B\*(b\*c - a\*d)\*i^2\*n\*(c + d\*x)\*(i\*(c + d\*x))^m\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]))

**Rubi [F]** time = 0.826472, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.$ , Rules used = {}

$$\int \frac{(ag + bgx)^m (ci + dix)^{-2-m}}{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2} dx$$

Verification is Not applicable to the result.

[In] Int[((a\*g + b\*g\*x)^m\*(c\*i + d\*i\*x)^(-2 - m))/(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2, x]

[Out] Defer[Int][((a\*g + b\*g\*x)^m\*(c\*i + d\*i\*x)^(-2 - m))/(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2, x]

Rubi steps

$$\int \frac{(216c + 216dx)^{-2-m}(ag + bgx)^m}{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2} dx = \int \frac{(216c + 216dx)^{-2-m}(ag + bgx)^m}{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2} dx$$

**Mathematica [F]** time = 0.257235, size = 0, normalized size = 0.

$$\int \frac{(ag + bgx)^m (ci + dix)^{-2-m}}{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2} dx$$

Verification is Not applicable to the result.

[In] Integrate[((a\*g + b\*g\*x)^m\*(c\*i + d\*i\*x)^(-2 - m))/(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2,x]

[Out] Integrate[((a\*g + b\*g\*x)^m\*(c\*i + d\*i\*x)^(-2 - m))/(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2, x]

**Maple [F]** time = 26.166, size = 0, normalized size = 0.

$$\int (bgx + ag)^m (dix + ci)^{-2-m} \left(A + B \ln\left(e\left(\frac{bx + a}{dx + c}\right)^n\right)\right)^{-2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^m\*(d\*i\*x+c\*i)^(-2-m)/(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2,x)

[Out] int((b\*g\*x+a\*g)^m\*(d\*i\*x+c\*i)^(-2-m)/(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2,x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$-g^m(m+1) \int -\frac{-(b^2 d^2 i^{m+2} n x^2 + 2 B^2 c d i^{m+2} n x + B^2 c^2 i^{m+2} n)}{(dx + c)^m \log((bx + a)^n) - (B^2 d^2 i^{m+2} n x^2 + 2 B^2 c d i^{m+2} n x + B^2 c^2 i^{m+2} n)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^m\*(d\*i\*x+c\*i)^(-2-m)/(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2,x, algorithm="maxima")

[Out] -g^m\*(m + 1)\*integrate(-(b\*x + a)^m/((B^2\*d^2\*i^(m + 2)\*n\*x^2 + 2\*B^2\*c\*d\*i^(m + 2)\*n\*x + B^2\*c^2\*i^(m + 2)\*n)\*(d\*x + c)^m\*log((b\*x + a)^n) - (B^2\*d^2\*i^(m + 2)\*n\*x^2 + 2\*B^2\*c\*d\*i^(m + 2)\*n\*x + B^2\*c^2\*i^(m + 2)\*n)\*(d\*x + c))

$$\begin{aligned} & \int (d^m \log((dx+c)^n) + (B^2 c^2 i^{m+2} n \log(e) + A B c^2 i^{m+2} n + (B^2 d^2 i^{m+2} n \log(e) + A B d^2 i^{m+2} n) x^2 + 2(B^2 c d i^{m+2} n \log(e) + A B c d i^{m+2} n) x) (dx+c)^m, x) - (b g^m x + a g^m) (b x + a)^m / (((b c d i^{m+2} n - a d^2 i^{m+2} n) B^2 x + (b c^2 i^{m+2} n + 2) n - a c d i^{m+2} n) B^2) (dx+c)^m \log((b x + a)^n) - ((b c d i^{m+2} n - a d^2 i^{m+2} n) B^2 x + (b c^2 i^{m+2} n - a c d i^{m+2} n) B^2) (dx+c)^m \log((dx+c)^n) + ((b c^2 i^{m+2} n - a c d i^{m+2} n) A B + (b c^2 i^{m+2} n \log(e) - a c d i^{m+2} n \log(e)) B^2 + ((b c d i^{m+2} n - a d^2 i^{m+2} n) A B + (b c d i^{m+2} n \log(e) - a d^2 i^{m+2} n \log(e)) B^2) x) (dx+c)^m \end{aligned}$$

**Fricas [A]** time = 0.544517, size = 676, normalized size = 3.28

$$\frac{(B b d g^2 n x^2 + B a c g^2 n + (B b c + B a d) g^2 n x) (b g x + a g)^m e^{(-(m+2) \log(b g x + a g) + (m+2) \log(\frac{b x + a}{d x + c}) - (m+2) \log(\frac{i}{g}))} - ((B m + B) n \log(\frac{b}{d}))}{(B^3 b c - B^3 a d) g^2 n^3 \log(\frac{b x + a}{d x + c}) + (B^3 b c - B^3 a d) g}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^m\*(d\*i\*x+c\*i)^(-2-m)/(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2,x, algorithm="fricas")

[Out] -((B\*b\*d\*g^2\*n\*x^2 + B\*a\*c\*g^2\*n + (B\*b\*c + B\*a\*d)\*g^2\*n\*x)\*(b\*g\*x + a\*g)^m \* e^(-(m+2)\*log(b\*g\*x + a\*g) + (m+2)\*log((b\*x + a)/(d\*x + c)) - (m+2)\*log(i/g)) - ((B\*m + B)\*n\*log((b\*x + a)/(d\*x + c)) + A\*m + (B\*m + B)\*log(e) + A)\*Ei(((B\*m + B)\*n\*log((b\*x + a)/(d\*x + c)) + A\*m + (B\*m + B)\*log(e) + A)/(B\*n)))/((B^3\*b\*c - B^3\*a\*d)\*g^2\*n^3\*log((b\*x + a)/(d\*x + c)) + (B^3\*b\*c - B^3\*a\*d)\*g^2\*n^2\*log(e) + (A\*B^2\*b\*c - A\*B^2\*a\*d)\*g^2\*n^2)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*\*m\*(d\*i\*x+c\*i)\*\*(-2-m)/(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n))\*\*2,x)



[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^m (dix + ci)^{-m-2}}{\left(B \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^m\*(d\*i\*x+c\*i)^(-2-m)/(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2,x, algorithm="giac")

[Out] integrate((b\*g\*x + a\*g)^m\*(d\*i\*x + c\*i)^(-m - 2)/(B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)^2, x)

$$3.217 \quad \int \frac{(ag+bgx)^m (ci+dx)^{-2-m}}{\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3} dx$$

**Optimal.** Leaf size=295

$$\frac{(m+1)^2 (a+bx) e^{-\frac{A(m+1)}{Bn}} (g(a+bx))^m (i(c+dx))^{-m} \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-\frac{m+1}{n}} \operatorname{Ei}\left(\frac{(m+1)\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{2B^3 i^2 n^3 (c+dx)(bc-ad)} - \frac{(m+1)(a+bx)(g(a+bx))^m (i(c+dx))^{-m} \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-\frac{m+1}{n}}}{2B^2 i^2 n^2 (c+dx)(bc-ad)}$$

[Out]  $((1+m)^2 (a+bx) (g(a+bx))^m \operatorname{ExpIntegralEi}[\frac{(1+m)(A+B \log[e((a+bx)/(c+dx))^n])}{Bn}]) / (2B^3 (bc-ad) E^{\frac{(1+m)(A+B \log[e((a+bx)/(c+dx))^n])}{Bn}}) * i^{2n} n^3 (e((a+bx)/(c+dx))^n)^{\frac{1+m}{n}} (c+dx) (i(c+dx))^m - ((a+bx) (g(a+bx))^m) / (2B (bc-ad) i^{2n} (c+dx) (i(c+dx))^m (A+B \log[e((a+bx)/(c+dx))^n])^2) - ((1+m)(a+bx) (g(a+bx))^m) / (2B^2 (bc-ad) i^{2n} n^2 (c+dx) (i(c+dx))^m (A+B \log[e((a+bx)/(c+dx))^n]))$

**Rubi [F]** time = 0.814608, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.$ , Rules used = {}

$$\int \frac{(ag+bgx)^m (ci+dx)^{-2-m}}{\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3} dx$$

Verification is Not applicable to the result.

[In]  $\operatorname{Int}[\frac{(a*g + b*g*x)^m (c*i + d*i*x)^{-2-m}}{(A + B \log[e((a+bx)/(c+dx))^n])^3}, x]$

[Out]  $\operatorname{Defer}[\operatorname{Int}[\frac{(a*g + b*g*x)^m (c*i + d*i*x)^{-2-m}}{(A + B \log[e((a+bx)/(c+dx))^n])^3}, x]]$

Rubi steps

$$\int \frac{(217c + 217dx)^{-2-m}(ag + bgx)^m}{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3} dx = \int \frac{(217c + 217dx)^{-2-m}(ag + bgx)^m}{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3} dx$$

**Mathematica [F]** time = 0.324248, size = 0, normalized size = 0.

$$\int \frac{(ag + bgx)^m(ci + dix)^{-2-m}}{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3} dx$$

Verification is Not applicable to the result.

[In] Integrate[((a\*g + b\*g\*x)^m\*(c\*i + d\*i\*x)^(-2 - m))/(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^3, x]

[Out] Integrate[((a\*g + b\*g\*x)^m\*(c\*i + d\*i\*x)^(-2 - m))/(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^3, x]

**Maple [F]** time = 23.922, size = 0, normalized size = 0.

$$\int (bgx + ag)^m (dix + ci)^{-2-m} \left(A + B \ln\left(e\left(\frac{bx + a}{dx + c}\right)^n\right)\right)^{-3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^m\*(d\*i\*x+c\*i)^(-2-m)/(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^3, x)

[Out] int((b\*g\*x+a\*g)^m\*(d\*i\*x+c\*i)^(-2-m)/(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^3, x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)/(A+B*log(e*((b*x+a)/(d*x+c))^n))
^3,x, algorithm="maxima")
```

```
[Out] -(m^2 + 2*m + 1)*g^m*integrate(-1/2*(b*x + a)^m/((B^3*d^2*i^(m + 2)*n^2*x^2
+ 2*B^3*c*d*i^(m + 2)*n^2*x + B^3*c^2*i^(m + 2)*n^2)*(d*x + c)^m*log((b*x
+ a)^n) - (B^3*d^2*i^(m + 2)*n^2*x^2 + 2*B^3*c*d*i^(m + 2)*n^2*x + B^3*c^2*
i^(m + 2)*n^2)*(d*x + c)^m*log((d*x + c)^n) + (B^3*c^2*i^(m + 2)*n^2*log(e)
+ A*B^2*c^2*i^(m + 2)*n^2 + (B^3*d^2*i^(m + 2)*n^2*log(e) + A*B^2*d^2*i^(m
+ 2)*n^2)*x^2 + 2*(B^3*c*d*i^(m + 2)*n^2*log(e) + A*B^2*c*d*i^(m + 2)*n^2)
*x)*(d*x + c)^m), x) - 1/2*((B*b*g^m*(m + 1)*x + B*a*g^m*(m + 1))*(b*x + a)
^m*log((b*x + a)^n) - (B*b*g^m*(m + 1)*x + B*a*g^m*(m + 1))*(b*x + a)^m*log
((d*x + c)^n) + (A*a*g^m*(m + 1) + (g^m*(m + 1)*log(e) + g^m*n)*B*a + (A*b*
g^m*(m + 1) + (g^m*(m + 1)*log(e) + g^m*n)*B*b)*x)*(b*x + a)^m)/(((b*c*d*i^
(m + 2)*n^2 - a*d^2*i^(m + 2)*n^2)*B^4*x + (b*c^2*i^(m + 2)*n^2 - a*c*d*i^(
m + 2)*n^2)*B^4)*(d*x + c)^m*log((b*x + a)^n)^2 + ((b*c*d*i^(m + 2)*n^2 - a
*d^2*i^(m + 2)*n^2)*B^4*x + (b*c^2*i^(m + 2)*n^2 - a*c*d*i^(m + 2)*n^2)*B^4
)*(d*x + c)^m*log((d*x + c)^n)^2 + 2*((b*c^2*i^(m + 2)*n^2 - a*c*d*i^(m + 2)
)*n^2)*A*B^3 + (b*c^2*i^(m + 2)*n^2*log(e) - a*c*d*i^(m + 2)*n^2*log(e))*B^
4 + ((b*c*d*i^(m + 2)*n^2 - a*d^2*i^(m + 2)*n^2)*A*B^3 + (b*c*d*i^(m + 2)*n
^2*log(e) - a*d^2*i^(m + 2)*n^2*log(e))*B^4)*x)*(d*x + c)^m*log((b*x + a)^n
) + ((b*c^2*i^(m + 2)*n^2 - a*c*d*i^(m + 2)*n^2)*A^2*B^2 + 2*(b*c^2*i^(m +
2)*n^2*log(e) - a*c*d*i^(m + 2)*n^2*log(e))*A*B^3 + (b*c^2*i^(m + 2)*n^2*lo
g(e)^2 - a*c*d*i^(m + 2)*n^2*log(e)^2)*B^4 + ((b*c*d*i^(m + 2)*n^2 - a*d^2*
i^(m + 2)*n^2)*A^2*B^2 + 2*(b*c*d*i^(m + 2)*n^2*log(e) - a*d^2*i^(m + 2)*n^
2*log(e))*A*B^3 + (b*c*d*i^(m + 2)*n^2*log(e)^2 - a*d^2*i^(m + 2)*n^2*log(e)
)^2)*B^4)*x)*(d*x + c)^m - 2*((b*c*d*i^(m + 2)*n^2 - a*d^2*i^(m + 2)*n^2)*
B^4*x + (b*c^2*i^(m + 2)*n^2 - a*c*d*i^(m + 2)*n^2)*B^4)*(d*x + c)^m*log((b
*x + a)^n) + ((b*c^2*i^(m + 2)*n^2 - a*c*d*i^(m + 2)*n^2)*A*B^3 + (b*c^2*i^
(m + 2)*n^2*log(e) - a*c*d*i^(m + 2)*n^2*log(e))*B^4 + ((b*c*d*i^(m + 2)*n^
2 - a*d^2*i^(m + 2)*n^2)*A*B^3 + (b*c*d*i^(m + 2)*n^2*log(e) - a*d^2*i^(m +
2)*n^2*log(e))*B^4)*x)*(d*x + c)^m*log((d*x + c)^n))
```

---

**Fricas [B]** time = 0.582135, size = 1791, normalized size = 6.07

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)/(A+B*log(e*((b*x+a)/(d*x+c))^n))
^3,x, algorithm="fricas")
```

```
[Out] -1/2*((B^2*a*c*g^2*n^2 + (B^2*b*d*g^2*n^2 + (A*B*b*d*g^2*m + A*B*b*d*g^2)*n
```

```

)*x^2 + (A*B*a*c*g^2*m + A*B*a*c*g^2)*n + ((B^2*b*c + B^2*a*d)*g^2*n^2 + ((
A*B*b*c + A*B*a*d)*g^2*m + (A*B*b*c + A*B*a*d)*g^2)*n)*x + ((B^2*b*d*g^2*m
+ B^2*b*d*g^2)*n*x^2 + ((B^2*b*c + B^2*a*d)*g^2*m + (B^2*b*c + B^2*a*d)*g^2
)*n*x + (B^2*a*c*g^2*m + B^2*a*c*g^2)*n)*log(e) + ((B^2*b*d*g^2*m + B^2*b*d
*g^2)*n^2*x^2 + ((B^2*b*c + B^2*a*d)*g^2*m + (B^2*b*c + B^2*a*d)*g^2)*n^2*x
+ (B^2*a*c*g^2*m + B^2*a*c*g^2)*n^2)*log((b*x + a)/(d*x + c))*(b*g*x + a
g)^m*e^(- (m + 2)*log(b*g*x + a*g) + (m + 2)*log((b*x + a)/(d*x + c)) - (m +
2)*log(i/g)) - ((B^2*m^2 + 2*B^2*m + B^2)*n^2*log((b*x + a)/(d*x + c))^2 +
A^2*m^2 + 2*A^2*m + (B^2*m^2 + 2*B^2*m + B^2)*log(e)^2 + 2*(A*B*m^2 + 2*A*
B*m + A*B)*n*log((b*x + a)/(d*x + c)) + A^2 + 2*(A*B*m^2 + 2*A*B*m + (B^2*m
^2 + 2*B^2*m + B^2)*n*log((b*x + a)/(d*x + c)) + A*B)*log(e))*Ei(((B*m + B
)*n*log((b*x + a)/(d*x + c)) + A*m + (B*m + B)*log(e) + A)/(B*n))*e^(-((B*m
+ 2*B)*n*log(i/g) + A*m + (B*m + B)*log(e) + A)/(B*n)))/((B^5*b*c - B^5*a*d
)*g^2*n^5*log((b*x + a)/(d*x + c))^2 + (B^5*b*c - B^5*a*d)*g^2*n^3*log(e)^2
+ 2*(A*B^4*b*c - A*B^4*a*d)*g^2*n^4*log((b*x + a)/(d*x + c)) + (A^2*B^3*b
c - A^2*B^3*a*d)*g^2*n^3 + 2*((B^5*b*c - B^5*a*d)*g^2*n^4*log((b*x + a)/(d*
x + c)) + (A*B^4*b*c - A*B^4*a*d)*g^2*n^3)*log(e))

```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```

[In] integrate((b*g*x+a*g)**m*(d*i*x+c*i)**(-2-m)/(A+B*ln(e*((b*x+a)/(d*x+c))**n
))**3,x)

```

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^m (dix + ci)^{-m-2}}{\left(B \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```

[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)/(A+B*log(e*((b*x+a)/(d*x+c))^n))
^3,x, algorithm="giac")

```

```
[Out] integrate((b*g*x + a*g)^m*(d*i*x + c*i)^(-m - 2)/(B*log(e*((b*x + a)/(d*x + c))^n) + A)^3, x)
```

$$3.218 \quad \int (ag+bgx)^{-2-m}(ci+dix)^m \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^3 dx$$

**Optimal.** Leaf size=309

$$\frac{6B^2n^2(a+bx)(g(a+bx))^{-m-2}(i(c+dx))^{m+2} \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{i^2(m+1)^3(c+dx)(bc-ad)} - \frac{(a+bx)(g(a+bx))^{-m-2}(i(c+dx))^{m+2} \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{i^2(m+1)(c+dx)(bc-ad)}$$

```
[Out] (-6*B^3*n^3*(a + b*x)*(g*(a + b*x))^( -2 - m)*(i*(c + d*x))^(2 + m))/((b*c - a*d)*i^2*(1 + m)^4*(c + d*x)) - (6*B^2*n^2*(a + b*x)*(g*(a + b*x))^( -2 - m)*(i*(c + d*x))^(2 + m)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)*i^2*(1 + m)^3*(c + d*x)) - (3*B*n*(a + b*x)*(g*(a + b*x))^( -2 - m)*(i*(c + d*x))^(2 + m)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)*i^2*(1 + m)^2*(c + d*x)) - ((a + b*x)*(g*(a + b*x))^( -2 - m)*(i*(c + d*x))^(2 + m)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^3)/((b*c - a*d)*i^2*(1 + m)*(c + d*x))
```

**Rubi [F]** time = 2.05475, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.$ , Rules used = {}

$$\int (ag+bgx)^{-2-m}(ci+dix)^m \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^3 dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^3,x]
```

```
[Out] -((A^3*(a*g + b*g*x)^(-1 - m)*(c*i + d*i*x)^(1 + m))/((b*c - a*d)*g*i*(1 + m))) - (3*A^2*B*n*(a*g + b*g*x)^(-1 - m)*(c*i + d*i*x)^(1 + m))/((b*c - a*d)*g*i*(1 + m)^2) - (3*A^2*B*(a*g + b*g*x)^(-1 - m)*(c*i + d*i*x)^(1 + m)*Log[e*((a + b*x)/(c + d*x))^n])/((b*c - a*d)*g*i*(1 + m)) + 3*A*B^2*Defer[Int][(a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m*Log[e*((a + b*x)/(c + d*x))^n]^2,x] + B^3*Defer[Int][(a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m*Log[e*((a + b*x)/(c + d*x))^n]^3,x]
```

Rubi steps

$$\begin{aligned}
\int (218c + 218dx)^m (ag + bgx)^{-2-m} \left( A + B \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) \right)^3 dx &= \int \left( A^3 (218c + 218dx)^m (ag + bgx)^{-2-m} + 3A^2B(218c + 218dx)^m (ag + bgx)^{-2-m} \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) \right. \\
&= A^3 \int (218c + 218dx)^m (ag + bgx)^{-2-m} dx + (3A^2B) \int (218c + 218dx)^m (ag + bgx)^{-2-m} \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) dx \\
&= -\frac{A^3 (218c + 218dx)^{1+m} (ag + bgx)^{-1-m}}{218(bc - ad)g(1 + m)} - \frac{3A^2B(218c + 218dx)^{1+m} (ag + bgx)^{-1-m}}{218(bc - ad)g(1 + m)} \\
&= -\frac{A^3 (218c + 218dx)^{1+m} (ag + bgx)^{-1-m}}{218(bc - ad)g(1 + m)} - \frac{3A^2B(218c + 218dx)^{1+m} (ag + bgx)^{-1-m}}{218(bc - ad)g(1 + m)} \\
&= -\frac{3 \cdot 218^m A^2 B n (c + dx)^{1+m} (ag + bgx)^{-1-m}}{(bc - ad)g(1 + m)^2} - \frac{A^3 (218c + 218dx)^{1+m} (ag + bgx)^{-1-m}}{218(bc - ad)g(1 + m)}
\end{aligned}$$

**Mathematica [A]** time = 6.69392, size = 206, normalized size = 0.67

$$\frac{(c + dx)(g(a + bx))^{-m-1}(i(c + dx))^m \left( 3B(m + 1) \left( A^2(m + 1)^2 + 2AB(m + 1)n + 2B^2n^2 \right) \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right) + 3B^2(m + 1)^2(A + B \log \left( e \left( \frac{a + bx}{c + dx} \right)^n \right)) \right)}{g(m + 1)}$$

Antiderivative was successfully verified.

[In] Integrate[(a\*g + b\*g\*x)^(-2 - m)\*(c\*i + d\*i\*x)^m\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^3,x]

[Out] -(((g\*(a + b\*x))^(1 - m)\*(c + d\*x)\*(i\*(c + d\*x))^m\*(A^3\*(1 + m)^3 + 3\*A^2\*B\*(1 + m)^2\*n + 6\*A\*B^2\*(1 + m)\*n^2 + 6\*B^3\*n^3 + 3\*B\*(1 + m)\*(A^2\*(1 + m)^2 + 2\*A\*B\*(1 + m)\*n + 2\*B^2\*n^2)\*Log[e\*((a + b\*x)/(c + d\*x))^n] + 3\*B^2\*(1 + m)^2\*(A + A\*m + B\*n)\*Log[e\*((a + b\*x)/(c + d\*x))^n]^2 + B^3\*(1 + m)^3\*Log[e\*((a + b\*x)/(c + d\*x))^n]^3))/((b\*c - a\*d)\*g\*(1 + m)^4)

**Maple [F]** time = 5.698, size = 0, normalized size = 0.

$$\int (bgx + ag)^{-2-m} (dix + ci)^m \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^3 dx$$

Verification of antiderivative is not currently implemented for this CAS.



[In] `int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^3,x)`

[Out] `int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^3,x)`

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$\int \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^3 (bgx+ag)^{-m-2} (dix+ci)^m dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n))^3,x, algorithm="maxima")`

[Out] `integrate((B*log(e*((b*x+a)/(d*x+c))^n)+A)^3*(b*g*x+a*g)^(-m-2)*(d*i*x+c*i)^m,x)`

**Fricas [B]** time = 0.822236, size = 5785, normalized size = 18.72

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n))^3,x, algorithm="fricas")`

[Out] `-(A^3*a*c*m^3 + 6*B^3*a*c*n^3 + 3*A^3*a*c*m^2 + 3*A^3*a*c*m + A^3*a*c + (B^3*a*c*m^3 + 3*B^3*a*c*m^2 + 3*B^3*a*c*m + B^3*a*c + (B^3*b*d*m^3 + 3*B^3*b*d*m^2 + 3*B^3*b*d*m + B^3*b*d)*x^2 + (B^3*b*c + B^3*a*d + (B^3*b*c + B^3*a*d)*m^3 + 3*(B^3*b*c + B^3*a*d)*m^2 + 3*(B^3*b*c + B^3*a*d)*m)*x)*log(e)^3 + ((B^3*b*d*m^3 + 3*B^3*b*d*m^2 + 3*B^3*b*d*m + B^3*b*d)*n^3*x^2 + (B^3*b*c + B^3*a*d + (B^3*b*c + B^3*a*d)*m^3 + 3*(B^3*b*c + B^3*a*d)*m^2 + 3*(B^3*b*c + B^3*a*d)*m)*n^3*x + (B^3*a*c*m^3 + 3*B^3*a*c*m^2 + 3*B^3*a*c*m + B^3*a*c)*n^3)*log((b*x+a)/(d*x+c))^3 + 6*(A*B^2*a*c*m + A*B^2*a*c)*n^2 + (A^3*b*d*m^3 + 6*B^3*b*d*n^3 + 3*A^3*b*d*m^2 + 3*A^3*b*d*m + A^3*b*d + 6*(A*B^2*b*d*m + A*B^2*b*d)*n^2 + 3*(A^2*B*b*d*m^2 + 2*A^2*B*b*d*m + A^2*B*b*d)*n)*x^2 + 3*(A*B^2*a*c*m^3 + 3*A*B^2*a*c*m^2 + 3*A*B^2*a*c*m + A*B^2*a*c + (A*B^2*b*d*m^3 + 3*A*B^2*b*d*m^2 + 3*A*B^2*b*d*m + A*B^2*b*d + (B^3*b*d*m^2 + 2*B^3*b*d*m + B^3*b*d)*n)*x^2 + (B^3*a*c*m^2 + 2*B^3*a*c*m + B^3*a*c)*n + (A`

$$\begin{aligned}
& *B^2*b*c + A*B^2*a*d + (A*B^2*b*c + A*B^2*a*d)*m^3 + 3*(A*B^2*b*c + A*B^2*a*d)*m^2 + 3*(A*B^2*b*c + A*B^2*a*d)*m + (B^3*b*c + B^3*a*d + (B^3*b*c + B^3*a*d)*m^2 + 2*(B^3*b*c + B^3*a*d)*m)*n)*x + ((B^3*b*d*m^3 + 3*B^3*b*d*m^2 + 3*B^3*b*d*m + B^3*b*d)*n*x^2 + (B^3*b*c + B^3*a*d + (B^3*b*c + B^3*a*d)*m^3 + 3*(B^3*b*c + B^3*a*d)*m^2 + 3*(B^3*b*c + B^3*a*d)*m)*n*x + (B^3*a*c*m^3 + 3*B^3*a*c*m^2 + 3*B^3*a*c*m + B^3*a*c)*n)*\log((b*x + a)/(d*x + c))*\log(e)^2 + 3*((B^3*a*c*m^2 + 2*B^3*a*c*m + B^3*a*c)*n^3 + (A*B^2*a*c*m^3 + 3*A*B^2*a*c*m^2 + 3*A*B^2*a*c*m + A*B^2*a*c)*n^2 + ((B^3*b*d*m^2 + 2*B^3*b*d*m + B^3*b*d)*n^3 + (A*B^2*b*d*m^3 + 3*A*B^2*b*d*m^2 + 3*A*B^2*b*d*m + A*B^2*b*d)*n^2)*x^2 + ((B^3*b*c + B^3*a*d + (B^3*b*c + B^3*a*d)*m^2 + 2*(B^3*b*c + B^3*a*d)*m)*n^3 + (A*B^2*b*c + A*B^2*a*d + (A*B^2*b*c + A*B^2*a*d)*m^3 + 3*(A*B^2*b*c + A*B^2*a*d)*m^2 + 3*(A*B^2*b*c + A*B^2*a*d)*m)*n^2)*x)*\log((b*x + a)/(d*x + c))^2 + 3*(A^2*B*a*c*m^2 + 2*A^2*B*a*c*m + A^2*B*a*c)*n + (A^3*b*c + A^3*a*d + (A^3*b*c + A^3*a*d)*m^3 + 6*(B^3*b*c + B^3*a*d)*n^3 + 3*(A^3*b*c + A^3*a*d)*m^2 + 6*(A*B^2*b*c + A*B^2*a*d + (A*B^2*b*c + A*B^2*a*d)*m)*n^2 + 3*(A^3*b*c + A^3*a*d)*m + 3*(A^2*B*b*c + A^2*B*a*d + (A^2*B*b*c + A^2*B*a*d)*m^2 + 2*(A^2*B*b*c + A^2*B*a*d)*m)*n)*x + 3*(A^2*B*a*c*m^3 + 3*A^2*B*a*c*m^2 + 3*A^2*B*a*c*m + A^2*B*a*c + 2*(B^3*a*c*m + B^3*a*c)*n^2 + (A^2*B*b*d*m^3 + 3*A^2*B*b*d*m^2 + 3*A^2*B*b*d*m + A^2*B*b*d + 2*(B^3*b*d*m + B^3*b*d)*n^2 + 2*(A*B^2*b*d*m^2 + 2*A*B^2*b*d*m + A*B^2*b*d)*n)*x^2 + ((B^3*b*d*m^3 + 3*B^3*b*d*m^2 + 3*B^3*b*d*m + B^3*b*d)*n^2*x^2 + (B^3*b*c + B^3*a*d + (B^3*b*c + B^3*a*d)*m^3 + 3*(B^3*b*c + B^3*a*d)*m)*n^2*x + (B^3*a*c*m^3 + 3*B^3*a*c*m^2 + 3*B^3*a*c*m + B^3*a*c)*n^2)*\log((b*x + a)/(d*x + c))^2 + 2*(A*B^2*a*c*m^2 + 2*A*B^2*a*c*m + A*B^2*a*c)*n + (A^2*B*b*c + A^2*B*a*d + (A^2*B*b*c + A^2*B*a*d)*m^3 + 3*(A^2*B*b*c + A^2*B*a*d)*m^2 + 2*(B^3*b*c + B^3*a*d + (B^3*b*c + B^3*a*d)*m)*n^2 + 3*(A^2*B*b*c + A^2*B*a*d)*m + 2*(A*B^2*b*c + A*B^2*a*d + (A*B^2*b*c + A*B^2*a*d)*m^2 + 2*(A*B^2*b*c + A*B^2*a*d)*m)*n)*x + 2*((B^3*a*c*m^2 + 2*B^3*a*c*m + B^3*a*c)*n^2 + ((B^3*b*d*m^2 + 2*B^3*b*d*m + B^3*b*d)*n^2 + (A*B^2*b*d*m^3 + 3*A*B^2*b*d*m^2 + 3*A*B^2*b*d*m + A*B^2*b*d)*n)*x^2 + (A*B^2*a*c*m^3 + 3*A*B^2*a*c*m^2 + 3*A*B^2*a*c*m + A*B^2*a*c)*n + ((B^3*b*c + B^3*a*d + (B^3*b*c + B^3*a*d)*m^2 + 2*(B^3*b*c + B^3*a*d)*m)*n^2 + (A*B^2*b*c + A*B^2*a*d)*m^3 + 3*(A*B^2*b*c + A*B^2*a*d)*m^2 + 3*(A*B^2*b*c + A*B^2*a*d)*m)*n)*x)*\log((b*x + a)/(d*x + c))*\log(e) + 3*(2*(B^3*a*c*m + B^3*a*c)*n^3 + 2*(A*B^2*a*c*m^2 + 2*A*B^2*a*c*m + A*B^2*a*c)*n^2 + (2*(B^3*b*d*m + B^3*b*d)*n^3 + 2*(A*B^2*b*d*m^2 + 2*A*B^2*b*d*m + A*B^2*b*d)*n^2 + (A^2*B*b*d*m^3 + 3*A^2*B*b*d*m^2 + 3*A^2*B*b*d*m + A^2*B*b*d)*n)*x^2 + (A^2*B*a*c*m^3 + 3*A^2*B*a*c*m^2 + 3*A^2*B*a*c*m + A^2*B*a*c)*n + (2*(B^3*b*c + B^3*a*d + (B^3*b*c + B^3*a*d)*m)*n^3 + 2*(A*B^2*b*c + A*B^2*a*d + (A*B^2*b*c + A*B^2*a*d)*m^2 + 2*(A*B^2*b*c + A*B^2*a*d)*m)*n^2 + (A^2*B*b*c + A^2*B*a*d + (A^2*B*b*c + A^2*B*a*d)*m^3 + 3*(A^2*B*b*c + A^2*B*a*d)*m^2 + 3*(A^2*B*b*c + A^2*B*a*d)*m)*n)*x)*\log((b*x + a)/(d*x + c))*(b*g*x + a*g)^{(-m - 2)}*e^{(m*\log(b*g*x + a*g) - m*\log((b*x + a)/(d*x + c)) + m*\log(i/g))}/((b*c - a*d)*m^4 + 4*(b*c - a*d)*m^3 + 6*(b*c - a*d)*m^2 + b*c - a*d + 4*(b*c - a*d)*m)
\end{aligned}$$

---

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*\*(-2-m)\*(d\*i\*x+c\*i)\*\*m\*(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n))\*\*3,x)

[Out] Timed out

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^3 (bgx+ag)^{-m-2} (dix+ci)^m dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^(-2-m)\*(d\*i\*x+c\*i)^m\*(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^3,x, algorithm="giac")

[Out] integrate((B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)^3\*(b\*g\*x + a\*g)^(-m - 2)\*(d\*i\*x + c\*i)^m, x)

$$3.219 \quad \int (ag+bgx)^{-2-m}(ci+dix)^m \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx$$

**Optimal.** Leaf size=223

$$\frac{(a+bx)(g(a+bx))^{-m-2}(i(c+dx))^{m+2} \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)^2}{i^2(m+1)(c+dx)(bc-ad)} - \frac{2Bn(a+bx)(g(a+bx))^{-m-2}(i(c+dx))^{m+2} \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2}{i^2(m+1)^2(c+dx)(bc-ad)}$$

[Out]  $(-2*B^2*n^2*(a+b*x)*(g*(a+b*x))^{(-2-m)}*(i*(c+d*x))^{(2+m)})/((b*c-a*d)*i^2*(1+m)^3*(c+d*x)) - (2*B*n*(a+b*x)*(g*(a+b*x))^{(-2-m)}*(i*(c+d*x))^{(2+m)}*(A+B*Log[e*((a+b*x)/(c+d*x))^n]))/((b*c-a*d)*i^2*(1+m)^2*(c+d*x)) - ((a+b*x)*(g*(a+b*x))^{(-2-m)}*(i*(c+d*x))^{(2+m)}*(A+B*Log[e*((a+b*x)/(c+d*x))^n])^2)/((b*c-a*d)*i^2*(1+m)*(c+d*x))$

**Rubi [F]** time = 1.15911, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.$ , Rules used = {}

$$\int (ag+bgx)^{-2-m}(ci+dix)^m \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx$$

Verification is Not applicable to the result.

[In] Int[(a\*g + b\*g\*x)^(-2 - m)\*(c\*i + d\*i\*x)^m\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2,x]

[Out]  $-((A^2*(a*g + b*g*x)^{(-1-m)}*(c*i + d*i*x)^{(1+m)})/((b*c - a*d)*g*i*(1+m))) - (2*A*B*n*(a*g + b*g*x)^{(-1-m)}*(c*i + d*i*x)^{(1+m)})/((b*c - a*d)*g*i*(1+m)^2) - (2*A*B*(a*g + b*g*x)^{(-1-m)}*(c*i + d*i*x)^{(1+m)}*Log[e*((a + b*x)/(c + d*x))^n])/((b*c - a*d)*g*i*(1+m)) + B^2*Defer[Int][(a*g + b*g*x)^{(-2-m)}*(c*i + d*i*x)^m*Log[e*((a + b*x)/(c + d*x))^n]^2, x]$

Rubi steps

$$\begin{aligned}
\int (219c + 219dx)^m (ag + bgx)^{-2-m} \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right)^2 dx &= \int \left( A^2 (219c + 219dx)^m (ag + bgx)^{-2-m} + 2AB(219c + 219dx)^m (ag + bgx)^{-2-m} \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx \\
&= A^2 \int (219c + 219dx)^m (ag + bgx)^{-2-m} dx + (2AB) \int (219c + 219dx)^m (ag + bgx)^{-2-m} \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) dx \\
&= -\frac{A^2 (219c + 219dx)^{1+m} (ag + bgx)^{-1-m}}{219(bc - ad)g(1+m)} - \frac{2AB(219c + 219dx)^{1+m} (ag + bgx)^{-1-m}}{219(bc - ad)g(1+m)} \\
&= -\frac{A^2 (219c + 219dx)^{1+m} (ag + bgx)^{-1-m}}{219(bc - ad)g(1+m)} - \frac{2AB(219c + 219dx)^{1+m} (ag + bgx)^{-1-m}}{219(bc - ad)g(1+m)} \\
&= -\frac{2 \cdot 219^m ABn(c + dx)^{1+m} (ag + bgx)^{-1-m}}{(bc - ad)g(1+m)^2} - \frac{A^2 (219c + 219dx)^{1+m} (ag + bgx)^{-1-m}}{(bc - ad)g(1+m)^2}
\end{aligned}$$

**Mathematica [A]** time = 2.03633, size = 134, normalized size = 0.6

$$\frac{(c + dx)(g(a + bx))^{-m-1}(i(c + dx))^m \left( 2B(m + 1)(Am + A + Bn) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + B^2(m + 1)^2 \log^2 \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A^2(m + 1)^2 \right)}{g(m + 1)^3(bc - ad)}$$

Antiderivative was successfully verified.

[In] Integrate[(a\*g + b\*g\*x)^(-2 - m)\*(c\*i + d\*i\*x)^m\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2,x]

[Out] -(((g\*(a + b\*x))^(-1 - m)\*(c + d\*x)\*(i\*(c + d\*x))^m\*(A^2\*(1 + m)^2 + 2\*A\*B\*(1 + m)\*n + 2\*B^2\*n^2 + 2\*B\*(1 + m)\*(A + A\*m + B\*n)\*Log[e\*((a + b\*x)/(c + d\*x))^n] + B^2\*(1 + m)^2\*Log[e\*((a + b\*x)/(c + d\*x))^n]^2))/((b\*c - a\*d)\*g\*(1 + m)^3))

**Maple [F]** time = 4.479, size = 0, normalized size = 0.

$$\int (bgx + ag)^{-2-m} (dix + ci)^m \left( A + B \ln \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$\int \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2 (bgx+ag)^{-m-2} (dix+ci)^m dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="maxima")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2*(b*g*x + a*g)^(-m - 2)*(d*i*x + c*i)^m, x)
```

**Fricas [B]** time = 0.646078, size = 2186, normalized size = 9.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fricas")
```

```
[Out] -(A^2*a*c*m^2 + 2*B^2*a*c*n^2 + 2*A^2*a*c*m + A^2*a*c + (A^2*b*d*m^2 + 2*B^2*b*d*n^2 + 2*A^2*b*d*m + A^2*b*d + 2*(A*B*b*d*m + A*B*b*d)*n)*x^2 + (B^2*a*c*m^2 + 2*B^2*a*c*m + B^2*a*c + (B^2*b*d*m^2 + 2*B^2*b*d*m + B^2*b*d)*x^2 + (B^2*b*c + B^2*a*d + (B^2*b*c + B^2*a*d)*m^2 + 2*(B^2*b*c + B^2*a*d)*m)*x)*log(e)^2 + ((B^2*b*d*m^2 + 2*B^2*b*d*m + B^2*b*d)*n^2*x^2 + (B^2*b*c + B^2*a*d + (B^2*b*c + B^2*a*d)*m^2 + 2*(B^2*b*c + B^2*a*d)*m)*n^2*x + (B^2*a*c*m^2 + 2*B^2*a*c*m + B^2*a*c)*n^2)*log((b*x + a)/(d*x + c))^2 + 2*(A*B*a*c*m + A*B*a*c)*n + (A^2*b*c + A^2*a*d + (A^2*b*c + A^2*a*d)*m^2 + 2*(B^2*b*c + B^2*a*d)*n^2 + 2*(A^2*b*c + A^2*a*d)*m + 2*(A*B*b*c + A*B*a*d + (A*B*b*c + A*B*a*d)*m)*n)*x + 2*(A*B*a*c*m^2 + 2*A*B*a*c*m + A*B*a*c + (A*B*b*d*m^2 + 2*A*B*b*d*m + A*B*b*d + (B^2*b*d*m + B^2*b*d)*n)*x^2 + (B^2*a*c*m + B^2*a*c)*n + (A*B*b*c + A*B*a*d + (A*B*b*c + A*B*a*d)*m^2 + 2*(A*B*b*c + A*B*a*d)*m + (B^2*b*c + B^2*a*d + (B^2*b*c + B^2*a*d)*m)*n)*x + ((B^2*b*d*m^2 + 2*
```

$$\begin{aligned}
& B^2*b*d*m + B^2*b*d)*n*x^2 + (B^2*b*c + B^2*a*d + (B^2*b*c + B^2*a*d)*m^2 + \\
& 2*(B^2*b*c + B^2*a*d)*m)*n*x + (B^2*a*c*m^2 + 2*B^2*a*c*m + B^2*a*c)*n)*\log((b*x + a)/(d*x + c)) * \log(e) + 2*((B^2*a*c*m + B^2*a*c)*n^2 + ((B^2*b*d*m \\
& + B^2*b*d)*n^2 + (A*B*b*d*m^2 + 2*A*B*b*d*m + A*B*b*d)*n)*x^2 + (A*B*a*c*m \\
& ^2 + 2*A*B*a*c*m + A*B*a*c)*n + ((B^2*b*c + B^2*a*d + (B^2*b*c + B^2*a*d)*m \\
& )*n^2 + (A*B*b*c + A*B*a*d + (A*B*b*c + A*B*a*d)*m^2 + 2*(A*B*b*c + A*B*a*d \\
& )*m)*n)*x)*\log((b*x + a)/(d*x + c)) * (b*g*x + a*g)^{-m-2} * e^{(m*\log(b*g*x \\
& + a*g) - m*\log((b*x + a)/(d*x + c)) + m*\log(i/g)) / ((b*c - a*d)*m^3 + 3*(b*c \\
& - a*d)*m^2 + b*c - a*d + 3*(b*c - a*d)*m)}
\end{aligned}$$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**(-2-m)*(d*i*x+c*i)**m*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2 (bgx+ag)^{-m-2} (dix+ci)^m dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2*(b*g*x + a*g)^(-m - 2)*(d*i*x + c*i)^m, x)
```

$$3.220 \quad \int (ag+bgx)^{-2-m}(ci+dix)^m \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx$$

**Optimal.** Leaf size=137

$$\frac{(a+bx)(g(a+bx))^{-m-2}(i(c+dx))^{m+2} \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}{i^2(m+1)(c+dx)(bc-ad)} - \frac{Bn(a+bx)(g(a+bx))^{-m-2}(i(c+dx))^{m+2}}{i^2(m+1)^2(c+dx)(bc-ad)}$$

[Out] -((B\*n\*(a + b\*x)\*(g\*(a + b\*x))<sup>(-2 - m)</sup>\*(i\*(c + d\*x))<sup>(2 + m)</sup>)/((b\*c - a\*d)\*i<sup>2</sup>\*(1 + m)<sup>2</sup>\*(c + d\*x))) - ((a + b\*x)\*(g\*(a + b\*x))<sup>(-2 - m)</sup>\*(i\*(c + d\*x))<sup>(2 + m)</sup>\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))<sup>n</sup>]))/((b\*c - a\*d)\*i<sup>2</sup>\*(1 + m)\*(c + d\*x))

**Rubi [A]** time = 0.616366, antiderivative size = 170, normalized size of antiderivative = 1.24, number of steps used = 6, number of rules used = 4, integrand size = 47,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.085$ , Rules used = {6742, 37, 2554, 12}

$$\frac{A(ag+bgx)^{-m-1}(ci+dix)^{m+1}}{gi(m+1)(bc-ad)} - \frac{B(ag+bgx)^{-m-1}(ci+dix)^{m+1} \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{gi(m+1)(bc-ad)} - \frac{Bn(ag+bgx)^{-m-1}(ci+dix)^{m+1}}{gi(m+1)^2(bc-ad)}$$

Antiderivative was successfully verified.

[In] Int[(a\*g + b\*g\*x)<sup>(-2 - m)</sup>\*(c\*i + d\*i\*x)<sup>m</sup>\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))<sup>n</sup>]), x]

[Out] -((A\*(a\*g + b\*g\*x)<sup>(-1 - m)</sup>\*(c\*i + d\*i\*x)<sup>(1 + m)</sup>)/((b\*c - a\*d)\*g\*i\*(1 + m)) - (B\*n\*(a\*g + b\*g\*x)<sup>(-1 - m)</sup>\*(c\*i + d\*i\*x)<sup>(1 + m)</sup>)/((b\*c - a\*d)\*g\*i\*(1 + m)<sup>2</sup>) - (B\*(a\*g + b\*g\*x)<sup>(-1 - m)</sup>\*(c\*i + d\*i\*x)<sup>(1 + m)</sup>\*Log[e\*((a + b\*x)/(c + d\*x))<sup>n</sup>])/((b\*c - a\*d)\*g\*i\*(1 + m))

### Rule 6742

Int[u\_, x\_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]

### Rule 37

Int[((a\_.) + (b\_.)\*(x\_))<sup>(m\_.)</sup>\*((c\_.) + (d\_.)\*(x\_))<sup>(n\_.)</sup>, x\_Symbol] := Simp[((a + b\*x)<sup>(m + 1)</sup>\*(c + d\*x)<sup>(n + 1)</sup>)/((b\*c - a\*d)\*(m + 1)), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b\*c - a\*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -



1]

Rule 2554

```
Int[Log[u_]*(v_), x_Symbol] := With[{w = IntHide[v, x]}, Dist[Log[u], w, x]
- Int[SimplifyIntegrand[(w*D[u, x])/u, x], x] /; InverseFunctionFreeQ[w, x]
]] /; InverseFunctionFreeQ[u, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rubi steps

$$\begin{aligned}
\int (220c + 220dx)^m (ag + bgx)^{-2-m} \left( A + B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx &= \int \left( A(220c + 220dx)^m (ag + bgx)^{-2-m} + B(220c + 220dx)^m (ag + bgx)^{-2-m} \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) \right) dx \\
&= A \int (220c + 220dx)^m (ag + bgx)^{-2-m} dx + B \int (220c + 220dx)^m (ag + bgx)^{-2-m} \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) dx \\
&= -\frac{A(220c + 220dx)^{1+m} (ag + bgx)^{-1-m}}{220(bc - ad)g(1+m)} - \frac{B(220c + 220dx)^{1+m} (ag + bgx)^{-1-m}}{220(bc - ad)g(1+m)} \\
&= -\frac{A(220c + 220dx)^{1+m} (ag + bgx)^{-1-m}}{220(bc - ad)g(1+m)} - \frac{B(220c + 220dx)^{1+m} (ag + bgx)^{-1-m}}{220(bc - ad)g(1+m)} \\
&= -\frac{220^m Bn(c + dx)^{1+m} (ag + bgx)^{-1-m}}{(bc - ad)g(1+m)^2} - \frac{A(220c + 220dx)^{1+m} (ag + bgx)^{-1-m}}{220(bc - ad)g(1+m)}
\end{aligned}$$

**Mathematica [A]** time = 0.508259, size = 78, normalized size = 0.57

$$\frac{(c + dx)(g(a + bx))^{-m-1}(c + dx)^m \left( B(m + 1) \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + Am + A + Bn \right)}{g(m + 1)^2(bc - ad)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^(-2 - m)*(c*i + d*i*x)^m*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

[Out]  $-\left(\left(g*(a + b*x)\right)^{-1 - m}*(c + d*x)*(i*(c + d*x))^m*(A + A*m + B*n + B*(1 + m)*\text{Log}[e*((a + b*x)/(c + d*x))^n])\right)/((b*c - a*d)*g*(1 + m)^2)$

**Maple [F]** time = 4.586, size = 0, normalized size = 0.

$$\int (bgx + ag)^{-2-m} (dix + ci)^m \left( A + B \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)`

[Out] `int((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)`

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$\int \left( B \log \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) + A \right) (bgx + ag)^{-m-2} (dix + ci)^m dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxima")`

[Out] `integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)*(b*g*x + a*g)^(-m - 2)*(d*i*x + c*i)^m, x)`

**Fricas [A]** time = 0.538503, size = 632, normalized size = 4.61

$$\left( Aacm + Bacn + Aac + (Abdm + Bbdn + Abd)x^2 + (Abc + Aad + (Abc + Aad)m + (Bbc + Bad)n)x + (Bacm + Bac + \dots \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fricas")`

```
[Out] -(A*a*c*m + B*a*c*n + A*a*c + (A*b*d*m + B*b*d*n + A*b*d)*x^2 + (A*b*c + A*
a*d + (A*b*c + A*a*d)*m + (B*b*c + B*a*d)*n)*x + (B*a*c*m + B*a*c + (B*b*d*
m + B*b*d)*x^2 + (B*b*c + B*a*d + (B*b*c + B*a*d)*m)*x)*log(e) + ((B*b*d*m
+ B*b*d)*n*x^2 + (B*b*c + B*a*d + (B*b*c + B*a*d)*m)*n*x + (B*a*c*m + B*a*c
)*n)*log((b*x + a)/(d*x + c))*(b*g*x + a*g)^(-m - 2)*e^(m*log(b*g*x + a*g)
- m*log((b*x + a)/(d*x + c)) + m*log(i/g))/((b*c - a*d)*m^2 + b*c - a*d +
2*(b*c - a*d)*m)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**(-2-m)*(d*i*x+c*i)**m*(A+B*ln(e*((b*x+a)/(d*x+c))**n
)),x)
```

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right) (bgx+ag)^{-m-2} (dix+ci)^m dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*((b*x+a)/(d*x+c))^n))
,x, algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)*(b*g*x + a*g)^(-m - 2)*(d*
i*x + c*i)^m, x)
```

$$3.221 \quad \int \frac{(ag+bgx)^{-2-m}(ci+dx)^m}{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx$$

**Optimal.** Leaf size=128

$$\frac{(a+bx)e^{\frac{A(m+1)}{Bn}}(g(a+bx))^{-m-2}(i(c+dx))^{m+2}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{m+1}{n}} \operatorname{Ei}\left(-\frac{(m+1)\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{B^2n(c+dx)(bc-ad)}$$

[Out]  $(E^{((A*(1+m))/(B*n))}*(a+b*x)*(g*(a+b*x))^{(-2-m)}*(e*((a+b*x)/(c+d*x))^n)^{((1+m)/n)}*(i*(c+d*x))^{(2+m)}*\operatorname{ExpIntegralEi}[-(((1+m)*(A+B*\operatorname{Log}[e*((a+b*x)/(c+d*x))^n]])/(B*n)))]/(B*(b*c-a*d)*i^{2*n}*(c+d*x))$

**Rubi [F]** time = 0.694768, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.$ , Rules used = {}

$$\int \frac{(ag+bgx)^{-2-m}(ci+dx)^m}{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx$$

Verification is Not applicable to the result.

[In]  $\operatorname{Int}[(a*g+b*g*x)^{(-2-m)}*(c*i+d*i*x)^m/(A+B*\operatorname{Log}[e*((a+b*x)/(c+d*x))^n]),x]$

[Out]  $\operatorname{Defer}[\operatorname{Int}[(a*g+b*g*x)^{(-2-m)}*(c*i+d*i*x)^m/(A+B*\operatorname{Log}[e*((a+b*x)/(c+d*x))^n]),x]]$

Rubi steps

$$\int \frac{(221c+221dx)^m(ag+bgx)^{-2-m}}{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx = \int \frac{(221c+221dx)^m(ag+bgx)^{-2-m}}{A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx$$

**Mathematica [F]** time = 0.234732, size = 0, normalized size = 0.

$$\int \frac{(ag + bgx)^{-2-m} (ci + dix)^m}{A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx$$

Verification is Not applicable to the result.

[In] Integrate[((a\*g + b\*g\*x)^(-2 - m)\*(c\*i + d\*i\*x)^m)/(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]), x]

[Out] Integrate[((a\*g + b\*g\*x)^(-2 - m)\*(c\*i + d\*i\*x)^m)/(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n]), x]

**Maple [F]** time = 3.039, size = 0, normalized size = 0.

$$\int (bgx + ag)^{-2-m} (dix + ci)^m \left( A + B \ln\left(e\left(\frac{bx + a}{dx + c}\right)^n\right) \right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^(-2-m)\*(d\*i\*x+c\*i)^m/(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n)), x)

[Out] int((b\*g\*x+a\*g)^(-2-m)\*(d\*i\*x+c\*i)^m/(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n)), x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^{-m-2} (dix + ci)^m}{B \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^(-2-m)\*(d\*i\*x+c\*i)^m/(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n)), x, algorithm="maxima")

[Out] integrate((b\*g\*x + a\*g)^(-m - 2)\*(d\*i\*x + c\*i)^m/(B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A), x)

---

**Fricas [A]** time = 0.528145, size = 216, normalized size = 1.69

$$\frac{\operatorname{Ei}\left(-\frac{(Bm+B)n \log\left(\frac{bx+a}{dx+c}\right) + Am + (Bm+B) \log(e) + A}{Bn}\right) e^{\left(\frac{Bmn \log\left(\frac{i}{g}\right) + Am + (Bm+B) \log(e) + A}{Bn}\right)}}{(Bbc - Bad)g^{2n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fricas")
```

```
[Out] Ei(-((B*m + B)*n*log((b*x + a)/(d*x + c)) + A*m + (B*m + B)*log(e) + A)/(B*n))*e^((B*m*n*log(i/g) + A*m + (B*m + B)*log(e) + A)/(B*n))/((B*b*c - B*a*d)*g^2*n)
```

---

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**(-2-m)*(d*i*x+c*i)**m/(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^{-m-2} (dix + ci)^m}{B \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^(-m - 2)*(d*i*x + c*i)^m/(B*log(e*((b*x + a)/(d*x + c))^n) + A), x)
```

$$3.222 \quad \int \frac{(ag+bgx)^{-2-m}(ci+dx)^m}{\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2} dx$$

**Optimal.** Leaf size=214

$$\frac{(m+1)(a+bx)e^{\frac{A(m+1)}{Bn}}(g(a+bx))^{-m-2}(i(c+dx))^{m+2}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{m+1}{n}} \operatorname{Ei}\left(-\frac{(m+1)\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{B^2i^2n^2(c+dx)(bc-ad)} - \frac{(a+bx)(g(a+bx))^{-m-2}(i(c+dx))^{m+2}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{m+1}{n}} \operatorname{Ei}\left(-\frac{(m+1)\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{Bi^2n(c+dx)(bc-ad)}$$

[Out]  $-\left(\frac{E^{\left(\frac{A(1+m)}{Bn}\right)}(1+m)(a+bx)(g(a+bx))^{-2-m}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{m+1}{n}}\right)}{B^2i^2n^2(c+dx)(bc-ad)} - \frac{(a+bx)(g(a+bx))^{-2-m}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{m+1}{n}} \operatorname{Ei}\left(-\frac{(m+1)\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{Bi^2n(c+dx)(bc-ad)}$

**Rubi [F]** time = 0.775964, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.$ , Rules used = {}

$$\int \frac{(ag+bgx)^{-2-m}(ci+dx)^m}{\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2} dx$$

Verification is Not applicable to the result.

[In]  $\operatorname{Int}\left[\left(\frac{(a+bx)^{-2-m}(c+dx)^m}{\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\right), x\right]$

[Out]  $\operatorname{Defer}\left[\operatorname{Int}\left[\left(\frac{(a+bx)^{-2-m}(c+dx)^m}{\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\right), x\right]\right]$

Rubi steps

$$\int \frac{(222c+222dx)^m(ag+bgx)^{-2-m}}{\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2} dx = \int \frac{(222c+222dx)^m(ag+bgx)^{-2-m}}{\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2} dx$$



**Mathematica [F]** time = 0.260073, size = 0, normalized size = 0.

$$\int \frac{(ag + bgx)^{-2-m}(ci + dix)^m}{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2} dx$$

Verification is Not applicable to the result.

[In] Integrate[((a\*g + b\*g\*x)^(-2 - m)\*(c\*i + d\*i\*x)^m)/(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2,x]

[Out] Integrate[((a\*g + b\*g\*x)^(-2 - m)\*(c\*i + d\*i\*x)^m)/(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2, x]

**Maple [F]** time = 25.665, size = 0, normalized size = 0.

$$\int (bgx + ag)^{-2-m} (dix + ci)^m \left(A + B \ln\left(e\left(\frac{bx + a}{dx + c}\right)^n\right)\right)^{-2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^(-2-m)\*(d\*i\*x+c\*i)^m/(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2,x)

[Out] int((b\*g\*x+a\*g)^(-2-m)\*(d\*i\*x+c\*i)^m/(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^2,x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$i^m(m+1) \int -\frac{1}{(B^2b^2g^{m+2}nx^2 + 2B^2abg^{m+2}nx + B^2a^2g^{m+2}n)(bx+a)^m \log((bx+a)^n) - (B^2b^2g^{m+2}nx^2 + 2B^2abg^{m+2}nx}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^(-2-m)\*(d\*i\*x+c\*i)^m/(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2,x, algorithm="maxima")

[Out] i^m\*(m + 1)\*integrate(-(d\*x + c)^m/((B^2\*b^2\*g^(m + 2)\*n\*x^2 + 2\*B^2\*a\*b\*g^(m + 2)\*n\*x + B^2\*a^2\*g^(m + 2)\*n)\*(b\*x + a)^m\*log((b\*x + a)^n) - (B^2\*b^2\*g^(m + 2)\*n\*x^2 + 2\*B^2\*a\*b\*g^(m + 2)\*n\*x + B^2\*a^2\*g^(m + 2)\*n)\*(b\*x + a)^

$$m \log((d*x + c)^n) + (B^2*a^2*g^{(m+2)*n} \log(e) + A*B*a^2*g^{(m+2)*n} + (B^2*b^2*g^{(m+2)*n} \log(e) + A*B*b^2*g^{(m+2)*n}) * x^2 + 2*(B^2*a*b*g^{(m+2)*n} \log(e) + A*B*a*b*g^{(m+2)*n}) * x) * (b*x + a)^m, x) - (d*i^m*x + c*i^m) * (d*x + c)^m / (((b^2*c*g^{(m+2)*n} - a*b*d*g^{(m+2)*n}) * B^2*x + (a*b*c*g^{(m+2)*n} - a^2*d*g^{(m+2)*n}) * B^2) * (b*x + a)^m \log((b*x + a)^n) - ((b^2*c*g^{(m+2)*n} - a*b*d*g^{(m+2)*n}) * B^2*x + (a*b*c*g^{(m+2)*n} - a^2*d*g^{(m+2)*n}) * B^2) * (b*x + a)^m \log((d*x + c)^n) + ((a*b*c*g^{(m+2)*n} - a^2*d*g^{(m+2)*n}) * A*B + (a*b*c*g^{(m+2)*n} \log(e) - a^2*d*g^{(m+2)*n} \log(e)) * B^2 + ((b^2*c*g^{(m+2)*n} - a*b*d*g^{(m+2)*n}) * A*B + (b^2*c*g^{(m+2)*n} \log(e) - a*b*d*g^{(m+2)*n} \log(e)) * B^2) * x) * (b*x + a)^m)$$

**Fricas [A]** time = 0.538907, size = 649, normalized size = 3.03

$$\frac{(Bbdg^2nx^2 + Bacg^2n + (Bbc + Bad)g^2nx)(bgx + ag)^{-m-2} e^{(m \log(bgx+ag) - m \log(\frac{bx+a}{dx+c}) + m \log(\frac{i}{g}))} + ((Bm + B)n \log(\frac{bx+a}{dx+c}) + A)}{(B^3bc - B^3ad)g^2n^3 \log(\frac{bx+a}{dx+c}) + (B^3bc - B^3ad)g^2n^2 \log(\frac{bx+a}{dx+c})}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^(-2-m)\*(d\*i\*x+c\*i)^m/(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2,x, algorithm="fricas")

[Out] -((B\*b\*d\*g^2\*n\*x^2 + B\*a\*c\*g^2\*n + (B\*b\*c + B\*a\*d)\*g^2\*n\*x)\*(b\*g\*x + a\*g)^(-m - 2)\*e^(m\*log(b\*g\*x + a\*g) - m\*log((b\*x + a)/(d\*x + c)) + m\*log(i/g)) + ((B\*m + B)\*n\*log((b\*x + a)/(d\*x + c)) + A\*m + (B\*m + B)\*log(e) + A)\*Ei(-((B\*m + B)\*n\*log((b\*x + a)/(d\*x + c)) + A\*m + (B\*m + B)\*log(e) + A)/(B\*n)) \* e^((B\*m\*n\*log(i/g) + A\*m + (B\*m + B)\*log(e) + A)/(B\*n)))/((B^3\*b\*c - B^3\*a\*d)\*g^2\*n^3\*log((b\*x + a)/(d\*x + c)) + (B^3\*b\*c - B^3\*a\*d)\*g^2\*n^2\*log(e) + (A\*B^2\*b\*c - A\*B^2\*a\*d)\*g^2\*n^2)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)\*\*(-2-m)\*(d\*i\*x+c\*i)\*\*m/(A+B\*ln(e\*((b\*x+a)/(d\*x+c))\*\*n))\*\*2,x)

[Out] Timed out

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^{-m-2} (dix + ci)^m}{\left( B \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) + A \right)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^(-2-m)\*(d\*i\*x+c\*i)^m/(A+B\*log(e\*((b\*x+a)/(d\*x+c))^n))^2,x, algorithm="giac")

[Out] integrate((b\*g\*x + a\*g)^(-m - 2)\*(d\*i\*x + c\*i)^m/(B\*log(e\*((b\*x + a)/(d\*x + c))^n) + A)^2, x)

$$3.223 \quad \int \frac{(ag+bgx)^{-2-m}(ci+dx)^m}{\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3} dx$$

**Optimal.** Leaf size=306

$$\frac{(m+1)^2(a+bx)e^{\frac{A(m+1)}{Bn}}(g(a+bx))^{-m-2}(i(c+dx))^{m+2}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{m+1}{n}} \operatorname{Ei}\left(-\frac{(m+1)\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{2B^3i^2n^3(c+dx)(bc-ad)} + \frac{(m+1)(a+bx)(g(a+bx))^{-m-2}(i(c+dx))^{m+2}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{m+1}{n}}}{2B^2i^2n^2(c+dx)(bc-ad)}$$

[Out] (E^((A\*(1+m))/(B\*n))\*(1+m)^2\*(a+b\*x)\*(g\*(a+b\*x))^(2-m)\*(e\*((a+b\*x)/(c+d\*x))^n)^((1+m)/n)\*(i\*(c+d\*x))^(2+m)\*ExpIntegralEi[-(((1+m)\*(A+B\*Log[e\*((a+b\*x)/(c+d\*x))^n]))/(B\*n))])/(2\*B^3\*(b\*c-a\*d)\*i^2\*n^3\*(c+d\*x)) - ((a+b\*x)\*(g\*(a+b\*x))^(2-m)\*(i\*(c+d\*x))^(2+m))/(2\*B\*(b\*c-a\*d)\*i^2\*n\*(c+d\*x)\*(A+B\*Log[e\*((a+b\*x)/(c+d\*x))^n])^2) + ((1+m)\*(a+b\*x)\*(g\*(a+b\*x))^(2-m)\*(i\*(c+d\*x))^(2+m))/(2\*B^2\*(b\*c-a\*d)\*i^2\*n^2\*(c+d\*x)\*(A+B\*Log[e\*((a+b\*x)/(c+d\*x))^n]))

**Rubi [F]** time = 0.757231, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.$ , Rules used = {}

$$\int \frac{(ag+bgx)^{-2-m}(ci+dx)^m}{\left(A+B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3} dx$$

Verification is Not applicable to the result.

[In] Int[((a\*g + b\*g\*x)^(-2 - m)\*(c\*i + d\*i\*x)^m)/(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^3, x]

[Out] Defer[Int][((a\*g + b\*g\*x)^(-2 - m)\*(c\*i + d\*i\*x)^m)/(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^3, x]

Rubi steps

$$\int \frac{(223c + 223dx)^m (ag + bgx)^{-2-m}}{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3} dx = \int \frac{(223c + 223dx)^m (ag + bgx)^{-2-m}}{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3} dx$$

**Mathematica [F]** time = 0.324389, size = 0, normalized size = 0.

$$\int \frac{(ag + bgx)^{-2-m} (ci + dix)^m}{\left(A + B \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^3} dx$$

Verification is Not applicable to the result.

[In] Integrate[((a\*g + b\*g\*x)^(-2 - m)\*(c\*i + d\*i\*x)^m)/(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^3, x]

[Out] Integrate[((a\*g + b\*g\*x)^(-2 - m)\*(c\*i + d\*i\*x)^m)/(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^3, x]

**Maple [F]** time = 25.781, size = 0, normalized size = 0.

$$\int (bgx + ag)^{-2-m} (dix + ci)^m \left(A + B \ln\left(e\left(\frac{bx + a}{dx + c}\right)^n\right)\right)^{-3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^(-2-m)\*(d\*i\*x+c\*i)^m/(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^3, x)

[Out] int((b\*g\*x+a\*g)^(-2-m)\*(d\*i\*x+c\*i)^m/(A+B\*ln(e\*((b\*x+a)/(d\*x+c))^n))^3, x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*log(e*((b*x+a)/(d*x+c))^n))
^3,x, algorithm="maxima")
```

```
[Out] -(m^2 + 2*m + 1)*i^m*integrate(-1/2*(d*x + c)^m/((B^3*b^2*g^(m + 2)*n^2*x^2
+ 2*B^3*a*b*g^(m + 2)*n^2*x + B^3*a^2*g^(m + 2)*n^2)*(b*x + a)^m*log((b*x
+ a)^n) - (B^3*b^2*g^(m + 2)*n^2*x^2 + 2*B^3*a*b*g^(m + 2)*n^2*x + B^3*a^2*
g^(m + 2)*n^2)*(b*x + a)^m*log((d*x + c)^n) + (B^3*a^2*g^(m + 2)*n^2*log(e)
+ A*B^2*a^2*g^(m + 2)*n^2 + (B^3*b^2*g^(m + 2)*n^2*log(e) + A*B^2*b^2*g^(m
+ 2)*n^2)*x^2 + 2*(B^3*a*b*g^(m + 2)*n^2*log(e) + A*B^2*a*b*g^(m + 2)*n^2)
*x)*(b*x + a)^m), x) + 1/2*((B*d*i^m*(m + 1)*x + B*c*i^m*(m + 1))*(d*x + c)
^m*log((b*x + a)^n) - (B*d*i^m*(m + 1)*x + B*c*i^m*(m + 1))*(d*x + c)^m*log
((d*x + c)^n) + (A*c*i^m*(m + 1) + (i^m*(m + 1)*log(e) - i^m*n)*B*c + (A*d*
i^m*(m + 1) + (i^m*(m + 1)*log(e) - i^m*n)*B*d)*x)*(d*x + c)^m)/(((b^2*c*g^
(m + 2)*n^2 - a*b*d*g^(m + 2)*n^2)*B^4*x + (a*b*c*g^(m + 2)*n^2 - a^2*d*g^
(m + 2)*n^2)*B^4)*(b*x + a)^m*log((b*x + a)^n)^2 + ((b^2*c*g^(m + 2)*n^2 - a
*b*d*g^(m + 2)*n^2)*B^4*x + (a*b*c*g^(m + 2)*n^2 - a^2*d*g^(m + 2)*n^2)*B^4
)*(b*x + a)^m*log((d*x + c)^n)^2 + 2*((a*b*c*g^(m + 2)*n^2 - a^2*d*g^(m + 2)
)*n^2)*A*B^3 + (a*b*c*g^(m + 2)*n^2*log(e) - a^2*d*g^(m + 2)*n^2*log(e))*B^
4 + ((b^2*c*g^(m + 2)*n^2 - a*b*d*g^(m + 2)*n^2)*A*B^3 + (b^2*c*g^(m + 2)*n
^2*log(e) - a*b*d*g^(m + 2)*n^2*log(e))*B^4)*x)*(b*x + a)^m*log((b*x + a)^n
) + ((a*b*c*g^(m + 2)*n^2 - a^2*d*g^(m + 2)*n^2)*A^2*B^2 + 2*(a*b*c*g^(m +
2)*n^2*log(e) - a^2*d*g^(m + 2)*n^2*log(e))*A*B^3 + (a*b*c*g^(m + 2)*n^2*lo
g(e)^2 - a^2*d*g^(m + 2)*n^2*log(e)^2)*B^4 + ((b^2*c*g^(m + 2)*n^2 - a*b*d*
g^(m + 2)*n^2)*A^2*B^2 + 2*(b^2*c*g^(m + 2)*n^2*log(e) - a*b*d*g^(m + 2)*n^
2*log(e))*A*B^3 + (b^2*c*g^(m + 2)*n^2*log(e)^2 - a*b*d*g^(m + 2)*n^2*log(e)
)^2)*B^4)*x)*(b*x + a)^m - 2*(((b^2*c*g^(m + 2)*n^2 - a*b*d*g^(m + 2)*n^2)*
B^4*x + (a*b*c*g^(m + 2)*n^2 - a^2*d*g^(m + 2)*n^2)*B^4)*(b*x + a)^m*log((b
*x + a)^n) + ((a*b*c*g^(m + 2)*n^2 - a^2*d*g^(m + 2)*n^2)*A*B^3 + (a*b*c*g^
(m + 2)*n^2*log(e) - a^2*d*g^(m + 2)*n^2*log(e))*B^4 + ((b^2*c*g^(m + 2)*n^
2 - a*b*d*g^(m + 2)*n^2)*A*B^3 + (b^2*c*g^(m + 2)*n^2*log(e) - a*b*d*g^(m +
2)*n^2*log(e))*B^4)*x)*(b*x + a)^m*log((d*x + c)^n))
```

---

**Fricas [B]** time = 0.547344, size = 1764, normalized size = 5.76

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*log(e*((b*x+a)/(d*x+c))^n))
^3,x, algorithm="fricas")
```

```
[Out] -1/2*((B^2*a*c*g^2*n^2 + (B^2*b*d*g^2*n^2 - (A*B*b*d*g^2*m + A*B*b*d*g^2)*n
```

```

)*x^2 - (A*B*a*c*g^2*m + A*B*a*c*g^2)*n + ((B^2*b*c + B^2*a*d)*g^2*n^2 - ((
A*B*b*c + A*B*a*d)*g^2*m + (A*B*b*c + A*B*a*d)*g^2)*n)*x - ((B^2*b*d*g^2*m
+ B^2*b*d*g^2)*n*x^2 + ((B^2*b*c + B^2*a*d)*g^2*m + (B^2*b*c + B^2*a*d)*g^2
)*n*x + (B^2*a*c*g^2*m + B^2*a*c*g^2)*n)*log(e) - ((B^2*b*d*g^2*m + B^2*b*d
*g^2)*n^2*x^2 + ((B^2*b*c + B^2*a*d)*g^2*m + (B^2*b*c + B^2*a*d)*g^2)*n^2*x
+ (B^2*a*c*g^2*m + B^2*a*c*g^2)*n^2)*log((b*x + a)/(d*x + c))*(b*g*x + a
g)^(-m - 2)*e^(m*log(b*g*x + a*g) - m*log((b*x + a)/(d*x + c)) + m*log(i/g)
) - ((B^2*m^2 + 2*B^2*m + B^2)*n^2*log((b*x + a)/(d*x + c))^2 + A^2*m^2 + 2
*A^2*m + (B^2*m^2 + 2*B^2*m + B^2)*log(e)^2 + 2*(A*B*m^2 + 2*A*B*m + A*B)*n
*log((b*x + a)/(d*x + c)) + A^2 + 2*(A*B*m^2 + 2*A*B*m + (B^2*m^2 + 2*B^2*m
+ B^2)*n*log((b*x + a)/(d*x + c)) + A*B)*log(e))*Ei(-((B*m + B)*n*log((b*x
+ a)/(d*x + c)) + A*m + (B*m + B)*log(e) + A)/(B*n))*e^((B*m*n*log(i/g) +
A*m + (B*m + B)*log(e) + A)/(B*n)))/((B^5*b*c - B^5*a*d)*g^2*n^5*log((b*x +
a)/(d*x + c))^2 + (B^5*b*c - B^5*a*d)*g^2*n^3*log(e)^2 + 2*(A*B^4*b*c - A*
B^4*a*d)*g^2*n^4*log((b*x + a)/(d*x + c)) + (A^2*B^3*b*c - A^2*B^3*a*d)*g^2
*n^3 + 2*((B^5*b*c - B^5*a*d)*g^2*n^4*log((b*x + a)/(d*x + c)) + (A*B^4*b*c
- A*B^4*a*d)*g^2*n^3)*log(e)

```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```

[In] integrate((b*g*x+a*g)**(-2-m)*(d*i*x+c*i)**m/(A+B*ln(e*((b*x+a)/(d*x+c))**n
))**3,x)

```

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^{-m-2} (dix + ci)^m}{\left(B \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```

[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m/(A+B*log(e*((b*x+a)/(d*x+c))^n))
^3,x, algorithm="giac")

```

```
[Out] integrate((b*g*x + a*g)^(-m - 2)*(d*i*x + c*i)^m/(B*log(e*((b*x + a)/(d*x + c))^n) + A)^3, x)
```



$$3.224 \quad \int \frac{\log^p \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{(a+bx)(c+dx)} dx$$

Optimal. Leaf size=41

$$\frac{\log^{p+1} \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{n(p+1)(bc-ad)}$$

[Out] Log[e\*((a + b\*x)/(c + d\*x))^n]^(1 + p)/((b\*c - a\*d)\*n\*(1 + p))

**Rubi [A]** time = 0.108104, antiderivative size = 41, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 35,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.029$ , Rules used = {2505}

$$\frac{\log^{p+1} \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{n(p+1)(bc-ad)}$$

Antiderivative was successfully verified.

[In] Int[Log[e\*((a + b\*x)/(c + d\*x))^n]^p/((a + b\*x)\*(c + d\*x)),x]

[Out] Log[e\*((a + b\*x)/(c + d\*x))^n]^(1 + p)/((b\*c - a\*d)\*n\*(1 + p))

### Rule 2505

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(u_), x_Symbol] := With[{h = Simplify[u*(a + b*x)*(c + d*x)]},
Simp[(h*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s + 1))/(p*r*(s + 1)*(b*c -
a*d)), x] /; FreeQ[h, x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && N
eQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[s, -1]
```

### Rubi steps

$$\int \frac{\log^p \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{(a+bx)(c+dx)} dx = \frac{\log^{1+p} \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{(bc-ad)n(1+p)}$$

**Mathematica [A]** time = 0.0263713, size = 40, normalized size = 0.98

$$\frac{\log^{p+1}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(p+1)(bcn-adn)}$$

Antiderivative was successfully verified.

[In] Integrate[Log[e\*((a + b\*x)/(c + d\*x))^n]^p/((a + b\*x)\*(c + d\*x)),x]

[Out] Log[e\*((a + b\*x)/(c + d\*x))^n]^(1 + p)/((b\*c\*n - a\*d\*n)\*(1 + p))

**Maple [F]** time = 0.861, size = 0, normalized size = 0.

$$\int \frac{1}{(bx+a)(dx+c)} \left( \ln \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) \right)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(ln(e\*((b\*x+a)/(d\*x+c))^n)^p/(b\*x+a)/(d\*x+c),x)

[Out] int(ln(e\*((b\*x+a)/(d\*x+c))^n)^p/(b\*x+a)/(d\*x+c),x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^p}{(bx+a)(dx+c)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(log(e\*((b\*x+a)/(d\*x+c))^n)^p/(b\*x+a)/(d\*x+c),x, algorithm="maxima")

[Out] integrate(log(e\*((b\*x + a)/(d\*x + c))^n)^p/((b\*x + a)\*(d\*x + c)), x)

**Fricas [A]** time = 0.537488, size = 153, normalized size = 3.73

$$\frac{\left(n \log\left(\frac{bx+a}{dx+c}\right) + \log(e)\right)\left(n \log\left(\frac{bx+a}{dx+c}\right) + \log(e)\right)^p}{(bc-ad)np + (bc-ad)n}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(log(e\*((b\*x+a)/(d\*x+c)))^n)^p/(b\*x+a)/(d\*x+c),x, algorithm="fricas")

[Out] (n\*log((b\*x + a)/(d\*x + c)) + log(e))\*(n\*log((b\*x + a)/(d\*x + c)) + log(e))^p/((b\*c - a\*d)\*n\*p + (b\*c - a\*d)\*n)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(ln(e\*((b\*x+a)/(d\*x+c)))\*\*n)\*\*p/(b\*x+a)/(d\*x+c),x)

[Out] Timed out

**Giac [A]** time = 1.27801, size = 63, normalized size = 1.54

$$\frac{\left(n \log\left(\frac{bx}{dx+c} + \frac{a}{dx+c}\right) + 1\right)^{p+1}}{(bcn - adn)(p + 1)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(log(e\*((b\*x+a)/(d\*x+c)))^n)^p/(b\*x+a)/(d\*x+c),x, algorithm="giac")

[Out] (n\*log(b\*x/(d\*x + c) + a/(d\*x + c)) + 1)^(p + 1)/((b\*c\*n - a\*d\*n)\*(p + 1))

$$3.225 \quad \int \frac{\log^p \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{ac+(bc+ad)x+bdx^2} dx$$

**Optimal.** Leaf size=41

$$\frac{\log^{p+1} \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{n(p+1)(bc-ad)}$$

[Out] Log[e\*((a + b\*x)/(c + d\*x))^n]^(1 + p)/((b\*c - a\*d)\*n\*(1 + p))

**Rubi [A]** time = 0.0414104, antiderivative size = 41, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 42,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.024$ , Rules used = {2505}

$$\frac{\log^{p+1} \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{n(p+1)(bc-ad)}$$

Antiderivative was successfully verified.

[In] Int[Log[e\*((a + b\*x)/(c + d\*x))^n]^p/(a\*c + (b\*c + a\*d)\*x + b\*d\*x^2), x]

[Out] Log[e\*((a + b\*x)/(c + d\*x))^n]^(1 + p)/((b\*c - a\*d)\*n\*(1 + p))

### Rule 2505

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{h = Simplify[u*(a + b*x)*(c + d*x)]}
, Simp[(h*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s + 1))/(p*r*(s + 1)*(b*c -
a*d)), x] /; FreeQ[h, x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && N
eQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[s, -1]
```

### Rubi steps

$$\int \frac{\log^p \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{ac + (bc + ad)x + bdx^2} dx = \frac{\log^{1+p} \left( e \left( \frac{a+bx}{c+dx} \right)^n \right)}{(bc - ad)n(1 + p)}$$

**Mathematica [A]** time = 0.0114759, size = 40, normalized size = 0.98

$$\frac{\log^{p+1}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(p+1)(bcn-adn)}$$

Antiderivative was successfully verified.

[In] Integrate[Log[e\*((a + b\*x)/(c + d\*x))^n]^p/(a\*c + (b\*c + a\*d)\*x + b\*d\*x^2), x]

[Out] Log[e\*((a + b\*x)/(c + d\*x))^n]^(1 + p)/((b\*c\*n - a\*d\*n)\*(1 + p))

**Maple [F]** time = 1.394, size = 0, normalized size = 0.

$$\int \frac{1}{ac + (ad + bc)x + bdx^2} \left( \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(ln(e\*((b\*x+a)/(d\*x+c))^n)^p/(a\*c+(a\*d+b\*c)\*x+b\*d\*x^2), x)

[Out] int(ln(e\*((b\*x+a)/(d\*x+c))^n)^p/(a\*c+(a\*d+b\*c)\*x+b\*d\*x^2), x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^p}{bdx^2 + ac + (bc + ad)x} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(log(e\*((b\*x+a)/(d\*x+c))^n)^p/(a\*c+(a\*d+b\*c)\*x+b\*d\*x^2), x, algorithm="maxima")

[Out] integrate(log(e\*((b\*x + a)/(d\*x + c))^n)^p/(b\*d\*x^2 + a\*c + (b\*c + a\*d)\*x), x)

---

**Fricas [A]** time = 0.499326, size = 153, normalized size = 3.73

$$\frac{\left(n \log\left(\frac{bx+a}{dx+c}\right) + \log(e)\right)\left(n \log\left(\frac{bx+a}{dx+c}\right) + \log(e)\right)^p}{(bc-ad)np + (bc-ad)n}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(log(e\*((b\*x+a)/(d\*x+c))^n)^p/(a\*c+(a\*d+b\*c)\*x+b\*d\*x^2),x, algorithm="fricas")

[Out] (n\*log((b\*x + a)/(d\*x + c)) + log(e))\*(n\*log((b\*x + a)/(d\*x + c)) + log(e))^p/((b\*c - a\*d)\*n\*p + (b\*c - a\*d)\*n)

---

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(ln(e\*((b\*x+a)/(d\*x+c)))\*\*n)\*\*p/(a\*c+(a\*d+b\*c)\*x+b\*d\*x\*\*2),x)

[Out] Timed out

---

**Giac [A]** time = 1.27922, size = 63, normalized size = 1.54

$$\frac{\left(n \log\left(\frac{bx}{dx+c} + \frac{a}{dx+c}\right) + 1\right)^{p+1}}{(bcn - adn)(p + 1)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(log(e\*((b\*x+a)/(d\*x+c))^n)^p/(a\*c+(a\*d+b\*c)\*x+b\*d\*x^2),x, algorithm="giac")

[Out] (n\*log(b\*x/(d\*x + c) + a/(d\*x + c)) + 1)^(p + 1)/((b\*c\*n - a\*d\*n)\*(p + 1))

### 3.226 $\int (ag+bgx)^m (ci+dix)^{-2-m} (A + B \log (e(a + bx)^n (c + dx)^{-n}))^p dx$

**Optimal.** Leaf size=193

$$\frac{(a + bx)e^{-\frac{A(m+1)}{Bn}}(g(a + bx))^m(i(c + dx))^{-m}(e(a + bx)^n(c + dx)^{-n})^{-\frac{m+1}{n}}(B \log (e(a + bx)^n(c + dx)^{-n}) + A)^p \left( -\frac{(m+1)(B \log (e(a + bx)^n(c + dx)^{-n}) + A)}{i^2(m+1)(c + dx)(bc - ad)} \right)}{i^2(m+1)(c + dx)(bc - ad)}$$

[Out] ((a + b\*x)\*(g\*(a + b\*x))^m\*Gamma[1 + p, -(((1 + m)\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x]^n)))/(B\*n))]\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x]^n))^p)/((b\*c - a\*d)\*E^((A\*(1 + m))/(B\*n))\*i^2\*(1 + m)\*(c + d\*x)\*(i\*(c + d\*x))^m\*((e\*(a + b\*x)^n)/(c + d\*x]^n)^((1 + m)/n)\*(-(((1 + m)\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x]^n)))/(B\*n))))^p)

**Rubi [F]** time = 0.811082, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.$ , Rules used = {}

$$\int (ag + bgx)^m (ci + dix)^{-2-m} (A + B \log (e(a + bx)^n (c + dx)^{-n}))^p dx$$

Verification is Not applicable to the result.

[In] Int[(a\*g + b\*g\*x)^m\*(c\*i + d\*i\*x)^(-2 - m)\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x]^n))^p, x]

[Out] Defer[Int] [(a\*g + b\*g\*x)^m\*(c\*i + d\*i\*x)^(-2 - m)\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x]^n))^p, x]

Rubi steps

$$\int (226c + 226dx)^{-2-m} (ag + bgx)^m (A + B \log (e(a + bx)^n (c + dx)^{-n}))^p dx = \int (226c + 226dx)^{-2-m} (ag + bgx)^m (A + B \log (e(a + bx)^n (c + dx)^{-n}))^p dx$$

**Mathematica [F]** time = 0.438299, size = 0, normalized size = 0.

$$\int (ag + bgx)^m (ci + dix)^{-2-m} (A + B \log (e(a + bx)^n (c + dx)^{-n}))^p dx$$

Verification is Not applicable to the result.

[In] Integrate[(a\*g + b\*g\*x)^m\*(c\*i + d\*i\*x)^(-2 - m)\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^p,x]

[Out] Integrate[(a\*g + b\*g\*x)^m\*(c\*i + d\*i\*x)^(-2 - m)\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^p, x]

**Maple [F]** time = 3.535, size = 0, normalized size = 0.

$$\int (bgx + ag)^m (dix + ci)^{-2-m} \left( A + B \ln \left( \frac{e(bx + a)^n}{(dx + c)^n} \right) \right)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^m\*(d\*i\*x+c\*i)^(-2-m)\*(A+B\*ln(e\*(b\*x+a)^n/((d\*x+c)^n)))^p,x)

[Out] int((b\*g\*x+a\*g)^m\*(d\*i\*x+c\*i)^(-2-m)\*(A+B\*ln(e\*(b\*x+a)^n/((d\*x+c)^n)))^p,x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$\int (bgx + ag)^m (dix + ci)^{-m-2} \left( B \log \left( \frac{(bx + a)^n e}{(dx + c)^n} \right) + A \right)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^m\*(d\*i\*x+c\*i)^(-2-m)\*(A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n)))^p,x, algorithm="maxima")

[Out] integrate((b\*g\*x + a\*g)^m\*(d\*i\*x + c\*i)^(-m - 2)\*(B\*log((b\*x + a)^n\*e/(d\*x + c)^n) + A)^p, x)

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( (bgx + ag)^m (dix + ci)^{-m-2} \left( B \log \left( \frac{(bx + a)^n e}{(dx + c)^n} \right) + A \right)^p, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.



```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))
)^p,x, algorithm="fricas")
```

```
[Out] integral((b*g*x + a*g)^m*(d*i*x + c*i)^(-m - 2)*(B*log((b*x + a)^n*e/(d*x +
c)^n) + A)^p, x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**m*(d*i*x+c*i)**(-2-m)*(A+B*ln(e*(b*x+a)**n/((d*x+c)*
*n)))**p,x)
```

```
[Out] Timed out
```

**Giac [F(-2)]** time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^m*(d*i*x+c*i)^(-2-m)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)
))^p,x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError
```

### 3.227 $\int (ag+bgx)^{-2-m}(ci+dix)^m (A + B \log (e(a + bx)^n(c + dx)^{-n}))^p dx$

**Optimal.** Leaf size=194

$$\frac{(a + bx)e^{\frac{A(m+1)}{Bn}}(g(a + bx))^{-m-2}(i(c + dx))^{m+2}(e(a + bx)^n(c + dx)^{-n})^{\frac{m+1}{n}}(B \log (e(a + bx)^n(c + dx)^{-n}) + A)^p \left( \frac{(m+1)(B \log (e(a + bx)^n(c + dx)^{-n}) + A)}{i^2(m+1)(c + dx)(bc - ad)} \right)}{i^2(m+1)(c + dx)(bc - ad)}$$

[Out]  $-\left(\frac{E^{\left(\frac{A(1+m)}{Bn}\right)}(a+bx)(g(a+bx))^{-2-m}(i(c+dx))^{2+m}}{(e(a+bx)^n/(c+dx)^n)^{\frac{1+m}{n}}\Gamma[1+p,((1+m)(A+B \log((e(a+bx)^n/(c+dx)^n)))/(Bn)](A+B \log((e(a+bx)^n/(c+dx)^n))\right)^p}{(bc-ad)i^{2+m}(c+dx)\left(\frac{(1+m)(A+B \log((e(a+bx)^n/(c+dx)^n)))/(Bn)}{i^2(m+1)(c+dx)(bc-ad)}\right)^p}\right)$

**Rubi [F]** time = 0.710533, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.$ , Rules used = {}

$$\int (ag + bgx)^{-2-m}(ci + dix)^m (A + B \log (e(a + bx)^n(c + dx)^{-n}))^p dx$$

Verification is Not applicable to the result.

[In] Int[(a\*g + b\*g\*x)^(-2 - m)\*(c\*i + d\*i\*x)^m\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])]^p, x]

[Out] Defer[Int][(a\*g + b\*g\*x)^(-2 - m)\*(c\*i + d\*i\*x)^m\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])]^p, x]

Rubi steps

$$\int (227c + 227dx)^m (ag + bgx)^{-2-m} (A + B \log (e(a + bx)^n(c + dx)^{-n}))^p dx = \int (227c + 227dx)^m (ag + bgx)^{-2-m} (A + B \log (e(a + bx)^n(c + dx)^{-n}))^p dx$$

**Mathematica [F]** time = 0.397671, size = 0, normalized size = 0.

$$\int (ag + bgx)^{-2-m}(ci + dix)^m (A + B \log (e(a + bx)^n(c + dx)^{-n}))^p dx$$

Verification is Not applicable to the result.

[In] Integrate[(a\*g + b\*g\*x)^(-2 - m)\*(c\*i + d\*i\*x)^m\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^p, x]

[Out] Integrate[(a\*g + b\*g\*x)^(-2 - m)\*(c\*i + d\*i\*x)^m\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^p, x]

**Maple [F]** time = 3.481, size = 0, normalized size = 0.

$$\int (bgx + ag)^{-2-m} (dix + ci)^m \left( A + B \ln \left( \frac{e (bx + a)^n}{(dx + c)^n} \right) \right)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*g\*x+a\*g)^(-2-m)\*(d\*i\*x+c\*i)^m\*(A+B\*ln(e\*(b\*x+a)^n/((d\*x+c)^n)))^p,x)

[Out] int((b\*g\*x+a\*g)^(-2-m)\*(d\*i\*x+c\*i)^m\*(A+B\*ln(e\*(b\*x+a)^n/((d\*x+c)^n)))^p,x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$\int (bgx + ag)^{-m-2} (dix + ci)^m \left( B \log \left( \frac{(bx + a)^n e}{(dx + c)^n} \right) + A \right)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*g\*x+a\*g)^(-2-m)\*(d\*i\*x+c\*i)^m\*(A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n)))^p,x, algorithm="maxima")

[Out] integrate((b\*g\*x + a\*g)^(-m - 2)\*(d\*i\*x + c\*i)^m\*(B\*log((b\*x + a)^n\*e/(d\*x + c)^n) + A)^p, x)

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( (bgx + ag)^{-m-2} (dix + ci)^m \left( B \log \left( \frac{(bx + a)^n e}{(dx + c)^n} \right) + A \right)^p, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))
)^p,x, algorithm="fricas")
```

```
[Out] integral((b*g*x + a*g)^(-m - 2)*(d*i*x + c*i)^m*(B*log((b*x + a)^n*e/(d*x +
c)^n) + A)^p, x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**(-2-m)*(d*i*x+c*i)**m*(A+B*ln(e*(b*x+a)**n/((d*x+c)*
*n))))**p,x)
```

```
[Out] Timed out
```

**Giac [F(-2)]** time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^(-2-m)*(d*i*x+c*i)^m*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)
))^p,x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError
```

$$3.228 \quad \int \frac{(A+B \log(e(a+bx)^n(c+dx)^{-n}))^3}{(a+bx)(c+dx)} dx$$

**Optimal.** Leaf size=45

$$\frac{(B \log(e(a+bx)^n(c+dx)^{-n}) + A)^4}{4Bn(bc-ad)}$$

[Out] (A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^4/(4\*B\*(b\*c - a\*d)\*n)

**Rubi [A]** time = 0.11773, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.025$ , Rules used = {6686}

$$\frac{(B \log(e(a+bx)^n(c+dx)^{-n}) + A)^4}{4Bn(bc-ad)}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^3/((a + b\*x)\*(c + d\*x)), x]

[Out] (A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^4/(4\*B\*(b\*c - a\*d)\*n)

**Rule 6686**

Int[(u\_)\*(y\_)^(m\_.), x\_Symbol] :> With[{q = DerivativeDivides[y, u, x]}, Simp[(q\*y^(m + 1))/(m + 1), x] /; !FalseQ[q]] /; FreeQ[m, x] && NeQ[m, -1]

**Rubi steps**

$$\int \frac{(A + B \log(e(a+bx)^n(c+dx)^{-n}))^3}{(a+bx)(c+dx)} dx = \frac{(A + B \log(e(a+bx)^n(c+dx)^{-n}))^4}{4B(bc-ad)n}$$

**Mathematica [A]** time = 0.0198009, size = 43, normalized size = 0.96

$$\frac{(B \log(e(a+bx)^n(c+dx)^{-n}) + A)^4}{4(bBcn - aBdn)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/((a + b*x)*(c + d*x)),
x]
```

```
[Out] (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^4/(4*(b*B*c*n - a*B*d*n))
```

**Maple [C]** time = 18.661, size = 64288, normalized size = 1428.6

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)/(d*x+c),x)
```

```
[Out] result too large to display
```

**Maxima [B]** time = 1.44248, size = 1034, normalized size = 22.98

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)/(d*x+c),x, algorithm
="maxima")
```

```
[Out] B^3*(log(b*x + a)/(b*c - a*d) - log(d*x + c)/(b*c - a*d))*log((b*x + a)^n*e
/(d*x + c)^n)^3 + 3*A*B^2*(log(b*x + a)/(b*c - a*d) - log(d*x + c)/(b*c - a
*d))*log((b*x + a)^n*e/(d*x + c)^n)^2 + 3*A^2*B*(log(b*x + a)/(b*c - a*d) -
log(d*x + c)/(b*c - a*d))*log((b*x + a)^n*e/(d*x + c)^n) - 1/4*B^3*(6*(e*n
*log(b*x + a)^2 - 2*e*n*log(b*x + a)*log(d*x + c) + e*n*log(d*x + c)^2)*log
((b*x + a)^n*e/(d*x + c)^n)^2/((b*c - a*d)*e) - (4*(e^2*n^2*log(b*x + a)^3
- 3*e^2*n^2*log(b*x + a)^2*log(d*x + c) + 3*e^2*n^2*log(b*x + a)*log(d*x +
c)^2 - e^2*n^2*log(d*x + c)^3)*log((b*x + a)^n*e/(d*x + c)^n)/((b*c - a*d)*
e) - (e^3*n^3*log(b*x + a)^4 - 4*e^3*n^3*log(b*x + a)^3*log(d*x + c) + 6*e^
3*n^3*log(b*x + a)^2*log(d*x + c)^2 - 4*e^3*n^3*log(b*x + a)*log(d*x + c)^3
+ e^3*n^3*log(d*x + c)^4)/((b*c - a*d)*e^2)/e) + A^3*(log(b*x + a)/(b*c -
a*d) - log(d*x + c)/(b*c - a*d)) - A*B^2*(3*(e*n*log(b*x + a)^2 - 2*e*n*lo
g(b*x + a)*log(d*x + c) + e*n*log(d*x + c)^2)*log((b*x + a)^n*e/(d*x + c)^n
)/((b*c - a*d)*e) - (e^2*n^2*log(b*x + a)^3 - 3*e^2*n^2*log(b*x + a)^2*log(
d*x + c) + 3*e^2*n^2*log(b*x + a)*log(d*x + c)^2 - e^2*n^2*log(d*x + c)^3)/
```

$$\left(\frac{(b*c - a*d)*e^2}{(b*x + a)^n} - \frac{3}{2}*(e^n*\log(b*x + a))^2 - 2*e^n*\log(b*x + a)*\log(d*x + c) + e^n*\log(d*x + c)^2\right)*A^2*B/(b*c - a*d)*e$$

**Fricas [B]** time = 0.522504, size = 906, normalized size = 20.13

$$\frac{B^3 n^3 \log(bx + a)^4 + B^3 n^3 \log(dx + c)^4 + 4(B^3 n^2 \log(e) + AB^2 n^2) \log(bx + a)^3 - 4(B^3 n^3 \log(bx + a) + B^3 n^2 \log(e) + AB^2 n^2) \log(bx + a)^2 + 6(B^3 n^3 \log(bx + a)^2 + B^3 n^3 \log(e)^2 + 2AB^2 n^2 \log(e) + A^2 B n) \log(bx + a) \log(dx + c) + 4(B^3 \log(e)^3 + 3AB^2 \log(e)^2 + 3A^2 B \log(e) + A^3) \log(bx + a) - 4(B^3 n^3 \log(bx + a)^3 + B^3 \log(e)^3 + 3AB^2 \log(e)^2 + 3A^2 B \log(e) + A^3 + 3(B^3 n^2 \log(e) + AB^2 n^2) \log(bx + a)^2 + 3(B^3 n^2 \log(e)^2 + 2AB^2 n \log(e) + A^2 B n) \log(bx + a)) \log(dx + c)}{(b*c - a*d)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n)))^3/(b\*x+a)/(d\*x+c),x, algorithm="fricas")

[Out] 1/4\*(B^3\*n^3\*log(b\*x + a)^4 + B^3\*n^3\*log(d\*x + c)^4 + 4\*(B^3\*n^2\*log(e) + A\*B^2\*n^2)\*log(b\*x + a)^3 - 4\*(B^3\*n^3\*log(b\*x + a) + B^3\*n^2\*log(e) + A\*B^2\*n^2)\*log(d\*x + c)^3 + 6\*(B^3\*n\*log(e)^2 + 2\*A\*B^2\*n\*log(e) + A^2\*B\*n)\*log(b\*x + a)^2 + 6\*(B^3\*n^3\*log(b\*x + a)^2 + B^3\*n\*log(e)^2 + 2\*A\*B^2\*n\*log(e) + A^2\*B\*n + 2\*(B^3\*n^2\*log(e) + A\*B^2\*n^2)\*log(b\*x + a))\*log(d\*x + c)^2 + 4\*(B^3\*log(e)^3 + 3\*A\*B^2\*log(e)^2 + 3\*A^2\*B\*log(e) + A^3)\*log(b\*x + a) - 4\*(B^3\*n^3\*log(b\*x + a)^3 + B^3\*log(e)^3 + 3\*A\*B^2\*log(e)^2 + 3\*A^2\*B\*log(e) + A^3 + 3\*(B^3\*n^2\*log(e) + A\*B^2\*n^2)\*log(b\*x + a)^2 + 3\*(B^3\*n\*log(e)^2 + 2\*A\*B^2\*n\*log(e) + A^2\*B\*n)\*log(b\*x + a))\*log(d\*x + c))/(b\*c - a\*d)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*(b\*x+a)\*\*n/((d\*x+c)\*\*n)))\*\*3/(b\*x+a)/(d\*x+c),x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B \log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A\right)^3}{(bx+a)(dx+c)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)/(d*x+c),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^3/((b*x + a)*(d*x + c)), x)
```



$$3.229 \quad \int \frac{(A+B \log(e(a+bx)^n(c+dx)^{-n}))^2}{(a+bx)(c+dx)} dx$$

**Optimal.** Leaf size=45

$$\frac{(B \log(e(a+bx)^n(c+dx)^{-n}) + A)^3}{3Bn(bc-ad)}$$

[Out] (A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^3/(3\*B\*(b\*c - a\*d)\*n)

**Rubi [A]** time = 0.112263, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.025$ , Rules used = {6686}

$$\frac{(B \log(e(a+bx)^n(c+dx)^{-n}) + A)^3}{3Bn(bc-ad)}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^2/((a + b\*x)\*(c + d\*x)), x]

[Out] (A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^3/(3\*B\*(b\*c - a\*d)\*n)

**Rule 6686**

Int[(u\_)\*(y\_)^(m\_.), x\_Symbol] :> With[{q = DerivativeDivides[y, u, x]}, Simp[(q\*y^(m + 1))/(m + 1), x] /; !FalseQ[q]] /; FreeQ[m, x] && NeQ[m, -1]

**Rubi steps**

$$\int \frac{(A + B \log(e(a+bx)^n(c+dx)^{-n}))^2}{(a+bx)(c+dx)} dx = \frac{(A + B \log(e(a+bx)^n(c+dx)^{-n}))^3}{3B(bc-ad)n}$$

**Mathematica [A]** time = 0.0154685, size = 43, normalized size = 0.96

$$\frac{(B \log(e(a+bx)^n(c+dx)^{-n}) + A)^3}{3(bBcn - aBdn)}$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^2/((a + b\*x)\*(c + d\*x)), x]

[Out] (A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^3/(3\*(b\*B\*c\*n - a\*B\*d\*n))

**Maple [C]** time = 2.427, size = 11062, normalized size = 245.8

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*(b\*x+a)^n/((d\*x+c)^n)))^2/(b\*x+a)/(d\*x+c), x)

[Out] result too large to display

**Maxima [B]** time = 1.36915, size = 522, normalized size = 11.6

$$B^2 \left( \frac{\log(bx+a)}{bc-ad} - \frac{\log(dx+c)}{bc-ad} \right) \log \left( \frac{(bx+a)^n e}{(dx+c)^n} \right)^2 + 2AB \left( \frac{\log(bx+a)}{bc-ad} - \frac{\log(dx+c)}{bc-ad} \right) \log \left( \frac{(bx+a)^n e}{(dx+c)^n} \right) + A^2 \left( \frac{\log(bx+a)}{bc-ad} - \frac{\log(dx+c)}{bc-ad} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n)))^2/(b\*x+a)/(d\*x+c), x, algorithm="maxima")

[Out] B^2\*(log(b\*x + a)/(b\*c - a\*d) - log(d\*x + c)/(b\*c - a\*d))\*log((b\*x + a)^n\*e/(d\*x + c)^n)^2 + 2\*A\*B\*(log(b\*x + a)/(b\*c - a\*d) - log(d\*x + c)/(b\*c - a\*d))\*log((b\*x + a)^n\*e/(d\*x + c)^n) + A^2\*(log(b\*x + a)/(b\*c - a\*d) - log(d\*x + c)/(b\*c - a\*d)) - 1/3\*B^2\*(3\*(e^n\*log(b\*x + a)^2 - 2\*e^n\*log(b\*x + a)\*log(d\*x + c) + e^n\*log(d\*x + c)^2)\*log((b\*x + a)^n\*e/(d\*x + c)^n)/((b\*c - a\*d)\*e) - (e^2\*n^2\*log(b\*x + a)^3 - 3\*e^2\*n^2\*log(b\*x + a)^2\*log(d\*x + c) + 3\*e^2\*n^2\*log(b\*x + a)\*log(d\*x + c)^2 - e^2\*n^2\*log(d\*x + c)^3)/((b\*c - a\*d)\*e^2) - (e^n\*log(b\*x + a)^2 - 2\*e^n\*log(b\*x + a)\*log(d\*x + c) + e^n\*log(d\*x + c)^2)\*A\*B/((b\*c - a\*d)\*e)

**Fricas [B]** time = 0.484184, size = 466, normalized size = 10.36

$$\frac{B^2 n^2 \log(bx + a)^3 - B^2 n^2 \log(dx + c)^3 + 3(B^2 n \log(e) + ABn) \log(bx + a)^2 + 3(B^2 n^2 \log(bx + a) + B^2 n \log(e) + ABn) \log(bx + a) \log(dx + c) + 3(B^2 n \log(e)^2 + 2ABn \log(e) + A^2 n) \log(bx + a) \log(dx + c) + 3(B^2 n \log(e)^2 + 2ABn \log(e) + A^2 n) \log(dx + c)^2}{(b^2 c - a^2 d)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n)))^2/(b\*x+a)/(d\*x+c),x, algorithm="fricas")

[Out] 1/3\*(B^2\*n^2\*log(b\*x + a)^3 - B^2\*n^2\*log(d\*x + c)^3 + 3\*(B^2\*n\*log(e) + A\*B\*n)\*log(b\*x + a)^2 + 3\*(B^2\*n^2\*log(b\*x + a) + B^2\*n\*log(e) + A\*B\*n)\*log(d\*x + c)^2 + 3\*(B^2\*log(e)^2 + 2\*A\*B\*log(e) + A^2)\*log(b\*x + a) - 3\*(B^2\*n^2\*log(b\*x + a)^2 + B^2\*log(e)^2 + 2\*A\*B\*log(e) + A^2 + 2\*(B^2\*n\*log(e) + A\*B\*n)\*log(b\*x + a))\*log(d\*x + c))/(b\*c - a\*d)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*(b\*x+a)\*\*n/((d\*x+c)\*\*n)))\*\*2/(b\*x+a)/(d\*x+c),x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left( B \log\left( \frac{(bx+a)^n e}{(dx+c)^n} \right) + A \right)^2}{(bx+a)(dx+c)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n)))^2/(b\*x+a)/(d\*x+c),x, algorithm="giac")

[Out] integrate((B\*log((b\*x + a)^n\*e/(d\*x + c)^n) + A)^2/((b\*x + a)\*(d\*x + c)), x)

$$3.230 \quad \int \frac{A+B \log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)(c+dx)} dx$$

**Optimal.** Leaf size=45

$$\frac{(B \log(e(a+bx)^n(c+dx)^{-n}) + A)^2}{2Bn(bc-ad)}$$

[Out] (A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^2/(2\*B\*(b\*c - a\*d)\*n)

**Rubi [A]** time = 0.082411, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 38,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.026$ , Rules used = {6686}

$$\frac{(B \log(e(a+bx)^n(c+dx)^{-n}) + A)^2}{2Bn(bc-ad)}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])/((a + b\*x)\*(c + d\*x)),x]

[Out] (A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^2/(2\*B\*(b\*c - a\*d)\*n)

### Rule 6686

Int[(u\_)\*(y\_)^(m\_.), x\_Symbol] := With[{q = DerivativeDivides[y, u, x]}, Si  
mp[(q\*y^(m + 1))/(m + 1), x] /; !FalseQ[q]] /; FreeQ[m, x] && NeQ[m, -1]

### Rubi steps

$$\int \frac{A + B \log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)(c+dx)} dx = \frac{(A + B \log(e(a+bx)^n(c+dx)^{-n}))^2}{2B(bc-ad)n}$$

**Mathematica [A]** time = 0.0121338, size = 43, normalized size = 0.96

$$\frac{(B \log(e(a+bx)^n(c+dx)^{-n}) + A)^2}{2(bBcn - aBdn)}$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])/((a + b\*x)\*(c + d\*x)),x]

[Out] (A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^2/(2\*(b\*B\*c\*n - a\*B\*d\*n))

**Maple [C]** time = 0.615, size = 1152, normalized size = 25.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*(b\*x+a)^n/((d\*x+c)^n)))/(b\*x+a)/(d\*x+c),x)

[Out] 
$$\frac{1}{(a*d-b*c)*A*\ln(-d*x-c)-1/(a*d-b*c)*A*\ln(b*x+a)-1/2*I/(a*d-b*c)*B*Pi*\ln(-d*x-c)*\operatorname{csgn}(I*(b*x+a)^n/((d*x+c)^n))^3+1/2*I/(a*d-b*c)*B*Pi*\ln(b*x+a)*\operatorname{csgn}(I*(b*x+a)^n/((d*x+c)^n))^3-1/2*I/(a*d-b*c)*B*Pi*\ln(-d*x-c)*\operatorname{csgn}(I*e/((d*x+c)^n)*(b*x+a)^n)^3+1/2*I/(a*d-b*c)*B*Pi*\ln(b*x+a)*\operatorname{csgn}(I*e/((d*x+c)^n)*(b*x+a)^n)^3-1/2*I/(a*d-b*c)*B*Pi*\ln(-d*x-c)*\operatorname{csgn}(I*(b*x+a)^n)*\operatorname{csgn}(I/((d*x+c)^n)))*\operatorname{csgn}(I*(b*x+a)^n/((d*x+c)^n))+1/2*I/(a*d-b*c)*B*Pi*\ln(b*x+a)*\operatorname{csgn}(I*(b*x+a)^n)*\operatorname{csgn}(I/((d*x+c)^n))*\operatorname{csgn}(I*(b*x+a)^n/((d*x+c)^n))-1/2*I/(a*d-b*c)*B*Pi*\ln(-d*x-c)*\operatorname{csgn}(I*e)*\operatorname{csgn}(I*(b*x+a)^n/((d*x+c)^n))*\operatorname{csgn}(I*e/((d*x+c)^n)*(b*x+a)^n)+1/2*I/(a*d-b*c)*B*Pi*\ln(b*x+a)*\operatorname{csgn}(I*e)*\operatorname{csgn}(I*(b*x+a)^n/((d*x+c)^n))*\operatorname{csgn}(I*e/((d*x+c)^n)*(b*x+a)^n)-1/(a*d-b*c)*B*n*\ln(b*x+a)*\ln(d*x+c)+1/(a*d-b*c)*B*\ln((b*x+a)^n)*\ln(d*x+c)+1/(a*d-b*c)*B*\ln(e)*\ln(-d*x-c)-1/(a*d-b*c)*B*\ln(e)*\ln(b*x+a)-1/(a*d-b*c)*B*\ln((b*x+a)^n)*\ln(b*x+a)+1/2/(a*d-b*c)*B*n*\ln(d*x+c)^2+1/2/(a*d-b*c)*B*n*\ln(b*x+a)^2+B*(\ln(b*x+a)-\ln(d*x+c))/(a*d-b*c)*\ln((d*x+c)^n)-1/2*I/(a*d-b*c)*B*Pi*\ln(b*x+a)*\operatorname{csgn}(I/((d*x+c)^n))*\operatorname{csgn}(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I/(a*d-b*c)*B*Pi*\ln(-d*x-c)*\operatorname{csgn}(I*(b*x+a)^n/((d*x+c)^n))*\operatorname{csgn}(I*e/((d*x+c)^n)*(b*x+a)^n)^2-1/2*I/(a*d-b*c)*B*Pi*\ln(b*x+a)*\operatorname{csgn}(I*(b*x+a)^n/((d*x+c)^n))*\operatorname{csgn}(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I/(a*d-b*c)*B*Pi*\ln(-d*x-c)*\operatorname{csgn}(I*e)*\operatorname{csgn}(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I/(a*d-b*c)*B*Pi*\ln(b*x+a)*\operatorname{csgn}(I*e)*\operatorname{csgn}(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I/(a*d-b*c)*B*Pi*\ln(-d*x-c)*\operatorname{csgn}(I*(b*x+a)^n)*\operatorname{csgn}(I*(b*x+a)^n/((d*x+c)^n))^2-1/2*I/(a*d-b*c)*B*Pi*\ln(b*x+a)*\operatorname{csgn}(I*(b*x+a)^n)*\operatorname{csgn}(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I/(a*d-b*c)*B*Pi*\ln(-d*x-c)*\operatorname{csgn}(I/((d*x+c)^n))*\operatorname{csgn}(I*(b*x+a)^n/((d*x+c)^n))^2$$

**Maxima [B]** time = 1.26903, size = 204, normalized size = 4.53

$$B\left(\frac{\log(bx+a)}{bc-ad} - \frac{\log(dx+c)}{bc-ad}\right)\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A\left(\frac{\log(bx+a)}{bc-ad} - \frac{\log(dx+c)}{bc-ad}\right) - \frac{(en \log(bx+a))^2 - 2en \log(bx+a)}{2(bc-ad)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n)))/(b\*x+a)/(d\*x+c),x, algorithm="maxima")

[Out] B\*(log(b\*x + a)/(b\*c - a\*d) - log(d\*x + c)/(b\*c - a\*d))\*log((b\*x + a)^n\*e/(d\*x + c)^n) + A\*(log(b\*x + a)/(b\*c - a\*d) - log(d\*x + c)/(b\*c - a\*d)) - 1/2\*(e\*n\*log(b\*x + a)^2 - 2\*e\*n\*log(b\*x + a)\*log(d\*x + c) + e\*n\*log(d\*x + c)^2)\*B/((b\*c - a\*d)\*e)

**Fricas [A]** time = 0.471431, size = 192, normalized size = 4.27

$$\frac{Bn \log(bx + a)^2 + Bn \log(dx + c)^2 + 2(B \log(e) + A) \log(bx + a) - 2(Bn \log(bx + a) + B \log(e) + A) \log(dx + c)}{2(bc - ad)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n)))/(b\*x+a)/(d\*x+c),x, algorithm="fricas")

[Out] 1/2\*(B\*n\*log(b\*x + a)^2 + B\*n\*log(d\*x + c)^2 + 2\*(B\*log(e) + A)\*log(b\*x + a) - 2\*(B\*n\*log(b\*x + a) + B\*log(e) + A)\*log(d\*x + c))/(b\*c - a\*d)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*(b\*x+a)\*\*n/((d\*x+c)\*\*n)))/(b\*x+a)/(d\*x+c),x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{B \log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A}{(bx+a)(dx+c)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)/(d*x+c),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)/((b*x + a)*(d*x + c)), x)
```

$$3.231 \quad \int \frac{1}{(a+bx)(c+dx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))} dx$$

**Optimal.** Leaf size=41

$$\frac{\log(B \log(e(a+bx)^n(c+dx)^{-n}) + A)}{Bn(bc-ad)}$$

[Out] Log[A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]]/(B\*(b\*c - a\*d)\*n)

**Rubi [A]** time = 0.122027, antiderivative size = 41, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.025$ , Rules used = {6684}

$$\frac{\log(B \log(e(a+bx)^n(c+dx)^{-n}) + A)}{Bn(bc-ad)}$$

Antiderivative was successfully verified.

[In] Int[1/((a + b\*x)\*(c + d\*x)\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])), x]

[Out] Log[A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]]/(B\*(b\*c - a\*d)\*n)

**Rule 6684**

Int[(u\_)/(y\_), x\_Symbol] :> With[{q = DerivativeDivides[y, u, x]}, Simp[q\*Log[RemoveContent[y, x]], x] /; !FalseQ[q]]

**Rubi steps**

$$\int \frac{1}{(a+bx)(c+dx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))} dx = \frac{\log(A + B \log(e(a+bx)^n(c+dx)^{-n}))}{B(bc-ad)n}$$

**Mathematica [A]** time = 0.0874408, size = 39, normalized size = 0.95

$$\frac{\log(B \log(e(a+bx)^n(c+dx)^{-n}) + A)}{bBcn - aBdn}$$

Antiderivative was successfully verified.



[In] Integrate[1/((a + b\*x)\*(c + d\*x)\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])), x]

[Out] Log[A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]]/(b\*B\*c\*n - a\*B\*d\*n)

**Maple [C]** time = 0.407, size = 368, normalized size = 9.

$$-\frac{1}{Bn(ad-bc)} \ln \left( \ln \left( (dx+c)^n \right) - \frac{1}{2B} \left( -iB\pi \operatorname{csgn}(ie) \operatorname{csgn} \left( \frac{i(bx+a)^n}{(dx+c)^n} \right) \operatorname{csgn} \left( \frac{ie(bx+a)^n}{(dx+c)^n} \right) + iB\pi \operatorname{csgn}(ie) \left( \operatorname{csgn} \left( \frac{ie}{(dx+c)^n} \right) \right) \right) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(b\*x+a)/(d\*x+c)/(A+B\*ln(e\*(b\*x+a)^n/((d\*x+c)^n))), x)

[Out] 
$$-1/B/n/(a*d-b*c)*\ln(\ln((d*x+c)^n)-1/2*(-I*B*Pi*csgn(I*e)*csgn(I*(b*x+a)^n/(d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+I*B*Pi*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-I*B*Pi*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))+I*B*Pi*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*B*Pi*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-I*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+I*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-I*B*Pi*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+2*B*\ln(e)+2*B*\ln((b*x+a)^n)+2*A)/B$$

**Maxima [A]** time = 1.72913, size = 66, normalized size = 1.61

$$\frac{\log \left( -\frac{B \log((bx+a)^n) - B \log((dx+c)^n) + B \log(e) + A}{B} \right)}{(bcn - adn)B}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b\*x+a)/(d\*x+c)/(A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n))), x, algorithm="maxima")

[Out] log(-(B\*log((b\*x + a)^n) - B\*log((d\*x + c)^n) + B\*log(e) + A)/B)/((b\*c\*n - a\*d\*n)\*B)

**Fricas [A]** time = 0.491652, size = 105, normalized size = 2.56

$$\frac{\log(-Bn \log(bx + a) + Bn \log(dx + c) - B \log(e) - A)}{(Bbc - Bad)n}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b\*x+a)/(d\*x+c)/(A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n))),x, algorithm="fricas")

[Out] log(-B\*n\*log(b\*x + a) + B\*n\*log(d\*x + c) - B\*log(e) - A)/((B\*b\*c - B\*a\*d)\*n)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b\*x+a)/(d\*x+c)/(A+B\*ln(e\*(b\*x+a)\*\*n/((d\*x+c)\*\*n))),x)

[Out] Timed out

**Giac [A]** time = 1.28151, size = 51, normalized size = 1.24

$$\frac{\log(Bn \log(bx + a) - Bn \log(dx + c) + A + B)}{Bbcn - Badn}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b\*x+a)/(d\*x+c)/(A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n))),x, algorithm="giac")

[Out] log(B\*n\*log(b\*x + a) - B\*n\*log(d\*x + c) + A + B)/(B\*b\*c\*n - B\*a\*d\*n)

$$3.232 \quad \int \frac{1}{(a+bx)(c+dx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))^2} dx$$

Optimal. Leaf size=43

$$-\frac{1}{Bn(bc-ad)(B \log(e(a+bx)^n(c+dx)^{-n})+A)}$$

[Out]  $-(1/(B*(b*c - a*d)*n*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])))$

**Rubi [A]** time = 0.121829, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.025$ , Rules used = {6686}

$$-\frac{1}{Bn(bc-ad)(B \log(e(a+bx)^n(c+dx)^{-n})+A)}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[1/((a + b*x)*(c + d*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2), x]$

[Out]  $-(1/(B*(b*c - a*d)*n*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])))$

#### Rule 6686

$\text{Int}[(u_*)*(y_)^{(m_.)}, x\_Symbol] \rightarrow \text{With}[\{q = \text{DerivativeDivides}[y, u, x]\}, \text{Simp}[(q*y^{(m+1)})/(m+1), x] /; \text{!FalseQ}[q] /; \text{FreeQ}[m, x] \&\& \text{NeQ}[m, -1]$

#### Rubi steps

$$\int \frac{1}{(a+bx)(c+dx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))^2} dx = -\frac{1}{B(bc-ad)n(A+B \log(e(a+bx)^n(c+dx)^{-n}))}$$

**Mathematica [A]** time = 0.0203908, size = 41, normalized size = 0.95

$$-\frac{1}{(bBcn - aBdn)(B \log(e(a+bx)^n(c+dx)^{-n})+A)}$$

Antiderivative was successfully verified.

[In] Integrate[1/((a + b\*x)\*(c + d\*x)\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^2),x]

[Out] -(1/((b\*B\*c\*n - a\*B\*d\*n)\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])))

**Maple [C]** time = 0.399, size = 366, normalized size = 8.5

$$2 \frac{1}{Bn(ad - bc)} \left( 2A + 2B \ln(e) + 2B \ln((bx + a)^n) - 2B \ln((dx + c)^n) - iB\pi \operatorname{csgn}(i(bx + a)^n) \operatorname{csgn}\left(\frac{i}{(dx + c)^n}\right) \operatorname{csgn}\left(\frac{i}{(dx + c)^n}\right) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(b\*x+a)/(d\*x+c)/(A+B\*ln(e\*(b\*x+a)^n/((d\*x+c)^n)))^2,x)

[Out] 2/B/n/(a\*d-b\*c)/(2\*A+2\*B\*ln(e)+2\*B\*ln((b\*x+a)^n)-2\*B\*ln((d\*x+c)^n)-I\*B\*Pi\*csgn(I\*(b\*x+a)^n)\*csgn(I/((d\*x+c)^n))\*csgn(I\*(b\*x+a)^n/((d\*x+c)^n))+I\*B\*Pi\*csgn(I\*(b\*x+a)^n)\*csgn(I\*(b\*x+a)^n/((d\*x+c)^n))^2+I\*B\*Pi\*csgn(I/((d\*x+c)^n))\*csgn(I\*(b\*x+a)^n/((d\*x+c)^n))^2-I\*B\*Pi\*csgn(I\*(b\*x+a)^n/((d\*x+c)^n))^3-I\*B\*Pi\*csgn(I\*e)\*csgn(I\*(b\*x+a)^n/((d\*x+c)^n))\*csgn(I\*e/((d\*x+c)^n)\*(b\*x+a)^n)+I\*B\*Pi\*csgn(I\*e)\*csgn(I\*e/((d\*x+c)^n)\*(b\*x+a)^n)^2+I\*B\*Pi\*csgn(I\*(b\*x+a)^n/((d\*x+c)^n))\*csgn(I\*e/((d\*x+c)^n)\*(b\*x+a)^n)^2-I\*B\*Pi\*csgn(I\*e/((d\*x+c)^n)\*(b\*x+a)^n)^3

**Maxima [A]** time = 1.80463, size = 109, normalized size = 2.53

1

$$\frac{(bcn - adn)B^2 \log((bx + a)^n) - (bcn - adn)B^2 \log((dx + c)^n) + (bcn - adn)AB + (bcn \log(e) - adn \log(e))B^2}{1}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b\*x+a)/(d\*x+c)/(A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n)))^2,x, algorithm="maxima")

[Out] -1/((b\*c\*n - a\*d\*n)\*B^2\*log((b\*x + a)^n) - (b\*c\*n - a\*d\*n)\*B^2\*log((d\*x + c)^n) + (b\*c\*n - a\*d\*n)\*A\*B + (b\*c\*n\*log(e) - a\*d\*n\*log(e))\*B^2)

**Fricas [A]** time = 0.507261, size = 185, normalized size = 4.3

$$\frac{1}{(B^2bc - B^2ad)n^2 \log(bx + a) - (B^2bc - B^2ad)n^2 \log(dx + c) + (B^2bc - B^2ad)n \log(e) + (ABbc - ABad)n}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b\*x+a)/(d\*x+c)/(A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n)))^2,x, algorithm="fricas")

[Out] -1/((B^2\*b\*c - B^2\*a\*d)\*n^2\*log(b\*x + a) - (B^2\*b\*c - B^2\*a\*d)\*n^2\*log(d\*x + c) + (B^2\*b\*c - B^2\*a\*d)\*n\*log(e) + (A\*B\*b\*c - A\*B\*a\*d)\*n)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b\*x+a)/(d\*x+c)/(A+B\*ln(e\*(b\*x+a)\*\*n/((d\*x+c)\*\*n)))\*\*2,x)

[Out] Timed out

**Giac [B]** time = 1.29514, size = 128, normalized size = 2.98

$$\frac{1}{B^2bcn^2 \log(bx + a) - B^2adn^2 \log(bx + a) - B^2bcn^2 \log(dx + c) + B^2adn^2 \log(dx + c) + ABbcn + B^2bcn - ABadn - B^2bcn}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b\*x+a)/(d\*x+c)/(A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n)))^2,x, algorithm="giac")

[Out] -1/(B^2\*b\*c\*n^2\*log(b\*x + a) - B^2\*a\*d\*n^2\*log(b\*x + a) - B^2\*b\*c\*n^2\*log(d\*x + c) + B^2\*a\*d\*n^2\*log(d\*x + c) + A\*B\*b\*c\*n + B^2\*b\*c\*n - A\*B\*a\*d\*n - B^2\*a\*d\*n)

$$3.233 \quad \int \frac{1}{(a+bx)(c+dx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))^3} dx$$

**Optimal.** Leaf size=45

$$-\frac{1}{2Bn(bc-ad)(B \log(e(a+bx)^n(c+dx)^{-n})+A)^2}$$

[Out]  $-1/(2*B*(b*c - a*d)*n*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2)$

**Rubi [A]** time = 0.122359, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.025$ , Rules used = {6686}

$$-\frac{1}{2Bn(bc-ad)(B \log(e(a+bx)^n(c+dx)^{-n})+A)^2}$$

Antiderivative was successfully verified.

[In]  $\text{Int}[1/((a + b*x)*(c + d*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3), x]$

[Out]  $-1/(2*B*(b*c - a*d)*n*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2)$

**Rule 6686**

$\text{Int}[(u_)*(y_)^(m_.), x\_Symbol] := \text{With}[\{q = \text{DerivativeDivides}[y, u, x]\}, \text{Simp}[(q*y^(m+1))/(m+1), x] /; \text{!FalseQ}[q] /; \text{FreeQ}[m, x] \&\& \text{NeQ}[m, -1]$

**Rubi steps**

$$\int \frac{1}{(a+bx)(c+dx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))^3} dx = -\frac{1}{2B(bc-ad)n(A+B \log(e(a+bx)^n(c+dx)^{-n}))^2}$$

**Mathematica [A]** time = 0.0196387, size = 43, normalized size = 0.96

$$-\frac{1}{2(bBcn - aBdn)(B \log(e(a+bx)^n(c+dx)^{-n})+A)^2}$$

Antiderivative was successfully verified.

[In] Integrate[1/((a + b\*x)\*(c + d\*x)\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^3),x]

[Out] -1/(2\*(b\*B\*c\*n - a\*B\*d\*n)\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^2)

**Maple [C]** time = 0.404, size = 366, normalized size = 8.1

$$2 \frac{1}{Bn(ad - bc)} \left( 2A + 2B \ln(e) + 2B \ln((bx + a)^n) - 2B \ln((dx + c)^n) - iB\pi \operatorname{csgn}(i(bx + a)^n) \operatorname{csgn}\left(\frac{i}{(dx + c)^n}\right) \operatorname{csgn}\left(\frac{i}{(dx + c)^n}\right) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(b\*x+a)/(d\*x+c)/(A+B\*ln(e\*(b\*x+a)^n/((d\*x+c)^n)))^3,x)

[Out] 2/B/n/(a\*d-b\*c)/(2\*A+2\*B\*ln(e)+2\*B\*ln((b\*x+a)^n)-2\*B\*ln((d\*x+c)^n)-I\*B\*Pi\*csgn(I\*(b\*x+a)^n)\*csgn(I/((d\*x+c)^n))\*csgn(I\*(b\*x+a)^n/((d\*x+c)^n))+I\*B\*Pi\*csgn(I\*(b\*x+a)^n)\*csgn(I\*(b\*x+a)^n/((d\*x+c)^n))^2+I\*B\*Pi\*csgn(I/((d\*x+c)^n))\*csgn(I\*(b\*x+a)^n/((d\*x+c)^n))^2-I\*B\*Pi\*csgn(I\*(b\*x+a)^n/((d\*x+c)^n))^3-I\*B\*Pi\*csgn(I\*e)\*csgn(I\*(b\*x+a)^n/((d\*x+c)^n))\*csgn(I\*e/((d\*x+c)^n)\*(b\*x+a)^n)+I\*B\*Pi\*csgn(I\*e)\*csgn(I\*e/((d\*x+c)^n)\*(b\*x+a)^n)^2+I\*B\*Pi\*csgn(I\*(b\*x+a)^n/((d\*x+c)^n))\*csgn(I\*e/((d\*x+c)^n)\*(b\*x+a)^n)^2-I\*B\*Pi\*csgn(I\*e/((d\*x+c)^n)\*(b\*x+a)^n)^2\*(b\*x+a)^n)^2

**Maxima [B]** time = 2.09508, size = 297, normalized size = 6.6

$$2 \left( (bcn - adn)B^3 \log((bx + a)^n)^2 + (bcn - adn)B^3 \log((dx + c)^n)^2 + (bcn - adn)A^2B + 2(bc n \log(e) - adn \log(e))AB \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b\*x+a)/(d\*x+c)/(A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n)))^3,x, algorithm="maxima")

[Out] -1/2/((b\*c\*n - a\*d\*n)\*B^3\*log((b\*x + a)^n)^2 + (b\*c\*n - a\*d\*n)\*B^3\*log((d\*x + c)^n)^2 + (b\*c\*n - a\*d\*n)\*A^2\*B + 2\*(b\*c\*n\*log(e) - a\*d\*n\*log(e))\*A\*B^2 + (b\*c\*n\*log(e)^2 - a\*d\*n\*log(e)^2)\*B^3 + 2\*((b\*c\*n - a\*d\*n)\*A\*B^2 + (b\*c\*n\*log(e) - a\*d\*n\*log(e))\*B^3)\*log((b\*x + a)^n) - 2\*((b\*c\*n - a\*d\*n)\*B^3\*log((b\*x + a)^n) + (b\*c\*n - a\*d\*n)\*A\*B^2 + (b\*c\*n\*log(e) - a\*d\*n\*log(e))\*B^3)\*1

$\log((d*x + c)^n)$

**Fricas [B]** time = 0.495569, size = 520, normalized size = 11.56

$$2\left(\left(B^3bc - B^3ad\right)n^3 \log (bx + a)^2 + \left(B^3bc - B^3ad\right)n^3 \log (dx + c)^2 + \left(B^3bc - B^3ad\right)n \log (e)^2 + 2\left(AB^2bc - AB^2ad\right)n \log (e)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b\*x+a)/(d\*x+c)/(A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n)))^3,x, algorithm="fricas")

[Out]  $-1/2/((B^3*b*c - B^3*a*d)*n^3*\log(b*x + a)^2 + (B^3*b*c - B^3*a*d)*n^3*\log(dx + c)^2 + (B^3*b*c - B^3*a*d)*n*\log(e)^2 + 2*(A*B^2*b*c - A*B^2*a*d)*n*\log(e) + (A^2*B*b*c - A^2*B*a*d)*n + 2*((B^3*b*c - B^3*a*d)*n^2*\log(e) + (A*B^2*b*c - A*B^2*a*d)*n^2)*\log(b*x + a) - 2*((B^3*b*c - B^3*a*d)*n^3*\log(b*x + a) + (B^3*b*c - B^3*a*d)*n^2*\log(e) + (A*B^2*b*c - A*B^2*a*d)*n^2)*\log(dx + c))$

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b\*x+a)/(d\*x+c)/(A+B\*ln(e\*(b\*x+a)\*\*n/((d\*x+c)\*\*n)))\*\*3,x)

[Out] Timed out

**Giac [B]** time = 1.23947, size = 406, normalized size = 9.02

$$2\left(B^3bcn^3 \log (bx + a)^2 - B^3adn^3 \log (bx + a)^2 - 2B^3bcn^3 \log (bx + a) \log (dx + c) + 2B^3adn^3 \log (bx + a) \log (dx + c)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b\*x+a)/(d\*x+c)/(A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n)))^3,x, algorithm="giac")



```
[Out] -1/2/(B^3*b*c*n^3*log(b*x + a)^2 - B^3*a*d*n^3*log(b*x + a)^2 - 2*B^3*b*c*n
^3*log(b*x + a)*log(d*x + c) + 2*B^3*a*d*n^3*log(b*x + a)*log(d*x + c) + B^
3*b*c*n^3*log(d*x + c)^2 - B^3*a*d*n^3*log(d*x + c)^2 + 2*A*B^2*b*c*n^2*log
(b*x + a) + 2*B^3*b*c*n^2*log(b*x + a) - 2*A*B^2*a*d*n^2*log(b*x + a) - 2*B
^3*a*d*n^2*log(b*x + a) - 2*A*B^2*b*c*n^2*log(d*x + c) - 2*B^3*b*c*n^2*log(
d*x + c) + 2*A*B^2*a*d*n^2*log(d*x + c) + 2*B^3*a*d*n^2*log(d*x + c) + A^2*
B*b*c*n + 2*A*B^2*b*c*n + B^3*b*c*n - A^2*B*a*d*n - 2*A*B^2*a*d*n - B^3*a*d
*n)
```

$$3.234 \quad \int \frac{(A+B \log(e(a+bx)^n(c+dx)^{-n}))^p}{(a+bx)(c+dx)} dx$$

**Optimal.** Leaf size=49

$$\frac{(B \log(e(a+bx)^n(c+dx)^{-n}) + A)^{p+1}}{Bn(p+1)(bc-ad)}$$

[Out] (A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^(1 + p)/(B\*(b\*c - a\*d)\*n\*(1 + p))

**Rubi [A]** time = 0.149343, antiderivative size = 49, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.025$ , Rules used = {6686}

$$\frac{(B \log(e(a+bx)^n(c+dx)^{-n}) + A)^{p+1}}{Bn(p+1)(bc-ad)}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^p/((a + b\*x)\*(c + d\*x)), x]

[Out] (A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^(1 + p)/(B\*(b\*c - a\*d)\*n\*(1 + p))

**Rule 6686**

Int[(u\_)\*(y\_)^(m\_.), x\_Symbol] := With[{q = DerivativeDivides[y, u, x]}, Si  
mp[(q\*y^(m + 1))/(m + 1), x] /; !FalseQ[q]] /; FreeQ[m, x] && NeQ[m, -1]

**Rubi steps**

$$\int \frac{(A + B \log(e(a+bx)^n(c+dx)^{-n}))^p}{(a+bx)(c+dx)} dx = \frac{(A + B \log(e(a+bx)^n(c+dx)^{-n}))^{1+p}}{B(bc-ad)n(1+p)}$$

**Mathematica [A]** time = 0.0275035, size = 47, normalized size = 0.96

$$\frac{(B \log(e(a+bx)^n(c+dx)^{-n}) + A)^{p+1}}{(p+1)(bBcn - aBdn)}$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^p/((a + b\*x)\*(c + d\*x)), x]

[Out] (A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^(1 + p)/((b\*B\*c\*n - a\*B\*d\*n)\*(1 + p))

**Maple [F]** time = 2.183, size = 0, normalized size = 0.

$$\int \frac{1}{(bx+a)(dx+c)} \left( A + B \ln \left( \frac{e(bx+a)^n}{(dx+c)^n} \right) \right)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*(b\*x+a)^n/((d\*x+c)^n)))^p/(b\*x+a)/(d\*x+c), x)

[Out] int((A+B\*ln(e\*(b\*x+a)^n/((d\*x+c)^n)))^p/(b\*x+a)/(d\*x+c), x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left( B \log \left( \frac{(bx+a)^n e}{(dx+c)^n} \right) + A \right)^p}{(bx+a)(dx+c)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n)))^p/(b\*x+a)/(d\*x+c), x, algorithm="maxima")

[Out] integrate((B\*log((b\*x + a)^n\*e/(d\*x + c)^n) + A)^p/((b\*x + a)\*(d\*x + c)), x)

**Fricas [A]** time = 0.544868, size = 204, normalized size = 4.16

$$\frac{(Bn \log(bx+a) - Bn \log(dx+c) + B \log(e) + A)(Bn \log(bx+a) - Bn \log(dx+c) + B \log(e) + A)^p}{(Bbc - Bad)np + (Bbc - Bad)n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^p/(b*x+a)/(d*x+c),x, algorithm="fricas")
```

```
[Out] (B*n*log(b*x + a) - B*n*log(d*x + c) + B*log(e) + A)*(B*n*log(b*x + a) - B*n*log(d*x + c) + B*log(e) + A)^p/((B*b*c - B*a*d)*n*p + (B*b*c - B*a*d)*n)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**p/(b*x+a)/(d*x+c),x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left( B \log \left( \frac{(bx+a)^n e}{(dx+c)^n} \right) + A \right)^p}{(bx+a)(dx+c)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^p/(b*x+a)/(d*x+c),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^p/((b*x + a)*(d*x + c)), x)
```

$$3.235 \quad \int \frac{(A+B \log(e(a+bx)^n(c+dx)^{-n}))^p}{(af+bfx)(cg+dgx)} dx$$

**Optimal.** Leaf size=55

$$\frac{(B \log(e(a+bx)^n(c+dx)^{-n}) + A)^{p+1}}{Bfgn(p+1)(bc-ad)}$$

[Out] (A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^(1 + p)/(B\*(b\*c - a\*d)\*f\*g\*n\*(1 + p))

**Rubi [A]** time = 0.215841, antiderivative size = 55, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 46,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.022$ , Rules used = {6686}

$$\frac{(B \log(e(a+bx)^n(c+dx)^{-n}) + A)^{p+1}}{Bfgn(p+1)(bc-ad)}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^p/((a\*f + b\*f\*x)\*(c\*g + d\*g\*x)), x]

[Out] (A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^(1 + p)/(B\*(b\*c - a\*d)\*f\*g\*n\*(1 + p))

**Rule 6686**

Int[(u\_)\*(y\_)^(m\_.), x\_Symbol] :> With[{q = DerivativeDivides[y, u, x]}, Simp[(q\*y^(m + 1))/(m + 1), x] /; !FalseQ[q] /; FreeQ[m, x] && NeQ[m, -1]

**Rubi steps**

$$\int \frac{(A + B \log(e(a+bx)^n(c+dx)^{-n}))^p}{(af+bfx)(cg+dgx)} dx = \frac{(A + B \log(e(a+bx)^n(c+dx)^{-n}))^{1+p}}{B(bc-ad)fgn(1+p)}$$

**Mathematica [A]** time = 0.046216, size = 51, normalized size = 0.93

$$\frac{(B \log(e(a+bx)^n(c+dx)^{-n}) + A)^{p+1}}{(p+1)(bBc fgn - aBd fgn)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^p/((a*f + b*f*x)*(c*g + d*g*x)), x]
```

```
[Out] (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^(1 + p)/((b*B*c*f*g*n - a*B*d*f*g*n)*(1 + p))
```

**Maple [F]** time = 2.22, size = 0, normalized size = 0.

$$\int \frac{1}{(bxf + af)(dgx + cg)} \left( A + B \ln \left( \frac{e(bx + a)^n}{(dx + c)^n} \right) \right)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^p/(b*f*x+a*f)/(d*g*x+c*g), x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^p/(b*f*x+a*f)/(d*g*x+c*g), x)
```

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left( B \log \left( \frac{(bx+a)^n e}{(dx+c)^n} \right) + A \right)^p}{(bfx + af)(dgx + cg)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^p/(b*f*x+a*f)/(d*g*x+c*g), x, algorithm="maxima")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^p/((b*f*x + a*f)*(d*g*x + c*g)), x)
```

**Fricas [A]** time = 0.511055, size = 215, normalized size = 3.91

$$\frac{(Bn \log(bx + a) - Bn \log(dx + c) + B \log(e) + A)(Bn \log(bx + a) - Bn \log(dx + c) + B \log(e) + A)^p}{(Bbc - Bad)fgnp + (Bbc - Bad)fgn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^p/(b*f*x+a*f)/(d*g*x+c*g),x, algorithm="fricas")
```

```
[Out] (B*n*log(b*x + a) - B*n*log(d*x + c) + B*log(e) + A)*(B*n*log(b*x + a) - B*n*log(d*x + c) + B*log(e) + A)^p/((B*b*c - B*a*d)*f*g*n*p + (B*b*c - B*a*d)*f*g*n)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**p/(b*f*x+a*f)/(d*g*x+c*g),x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B \log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A\right)^p}{(bfx + af)(dgx + cg)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^p/(b*f*x+a*f)/(d*g*x+c*g),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^p/((b*f*x + a*f)*(d*g*x + c*g)), x)
```

$$3.236 \quad \int \frac{(A+B \log(e(a+bx)^n(c+dx)^{-n}))^p}{acf+(bc+ad)fx+bdfx^2} dx$$

**Optimal.** Leaf size=52

$$\frac{(B \log(e(a+bx)^n(c+dx)^{-n}) + A)^{p+1}}{Bfn(p+1)(bc-ad)}$$

[Out] (A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^(1 + p)/(B\*(b\*c - a\*d)\*f\*n\*(1 + p))

**Rubi [A]** time = 0.106263, antiderivative size = 52, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 50,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.02$ , Rules used = {6686}

$$\frac{(B \log(e(a+bx)^n(c+dx)^{-n}) + A)^{p+1}}{Bfn(p+1)(bc-ad)}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^p/(a\*c\*f + (b\*c + a\*d)\*f\*x + b\*d\*f\*x^2), x]

[Out] (A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^(1 + p)/(B\*(b\*c - a\*d)\*f\*n\*(1 + p))

### Rule 6686

Int[(u\_)\*(y\_)^(m\_.), x\_Symbol] := With[{q = DerivativeDivides[y, u, x]}, Si mp[(q\*y^(m + 1))/(m + 1), x] /; !FalseQ[q] /; FreeQ[m, x] && NeQ[m, -1]

### Rubi steps

$$\int \frac{(A + B \log(e(a+bx)^n(c+dx)^{-n}))^p}{acf+(bc+ad)fx+bdfx^2} dx = \frac{(A + B \log(e(a+bx)^n(c+dx)^{-n}))^{1+p}}{B(bc-ad)fn(1+p)}$$

**Mathematica [A]** time = 0.0116366, size = 50, normalized size = 0.96

$$\frac{(B \log(e(a+bx)^n(c+dx)^{-n}) + A)^{p+1}}{f(p+1)(bBcn - aBdn)}$$



Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^p/(a\*c\*f + (b\*c + a\*d)\*f\*x + b\*d\*f\*x^2), x]

[Out] (A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^(1 + p)/(f\*(b\*B\*c\*n - a\*B\*d\*n)\*(1 + p))

**Maple [F]** time = 2.884, size = 0, normalized size = 0.

$$\int \frac{1}{acf + (ad + bc)fx + bdfx^2} \left( A + B \ln \left( \frac{e(bx + a)^n}{(dx + c)^n} \right) \right)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*(b\*x+a)^n/((d\*x+c)^n)))^p/(a\*c\*f+(a\*d+b\*c)\*f\*x+b\*d\*f\*x^2), x)

[Out] int((A+B\*ln(e\*(b\*x+a)^n/((d\*x+c)^n)))^p/(a\*c\*f+(a\*d+b\*c)\*f\*x+b\*d\*f\*x^2), x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left( B \log \left( \frac{(bx+a)^n e}{(dx+c)^n} \right) + A \right)^p}{bdfx^2 + acf + (bc + ad)fx} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n)))^p/(a\*c\*f+(a\*d+b\*c)\*f\*x+b\*d\*f\*x^2), x, algorithm="maxima")

[Out] integrate((B\*log((b\*x + a)^n\*e/(d\*x + c)^n) + A)^p/(b\*d\*f\*x^2 + a\*c\*f + (b\*c + a\*d)\*f\*x), x)

**Fricas [A]** time = 0.546326, size = 209, normalized size = 4.02

$$\frac{(Bn \log (bx + a) - Bn \log (dx + c) + B \log (e) + A)(Bn \log (bx + a) - Bn \log (dx + c) + B \log (e) + A)^p}{(Bbc - Bad)fnp + (Bbc - Bad)fn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^p/(a*c*f+(a*d+b*c)*f*x+b*d*f*x^2),x, algorithm="fricas")
```

```
[Out] (B*n*log(b*x + a) - B*n*log(d*x + c) + B*log(e) + A)*(B*n*log(b*x + a) - B*n*log(d*x + c) + B*log(e) + A)^p/((B*b*c - B*a*d)*f*n*p + (B*b*c - B*a*d)*f*n)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**p/(a*c*f+(a*d+b*c)*f*x+b*d*f*x**2),x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B \log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A\right)^p}{bdfx^2 + acf + (bc + ad)fx} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^p/(a*c*f+(a*d+b*c)*f*x+b*d*f*x^2),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^p/(b*d*f*x^2 + a*c*f + (b*c + a*d)*f*x), x)
```

$$3.237 \quad \int \frac{1}{(a+bx)(c+dx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))} dx$$

**Optimal.** Leaf size=41

$$\frac{\log(B \log(e(a+bx)^n(c+dx)^{-n}) + A)}{Bn(bc-ad)}$$

[Out] Log[A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]]/(B\*(b\*c - a\*d)\*n)

**Rubi [A]** time = 0.122921, antiderivative size = 41, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.025$ , Rules used = {6684}

$$\frac{\log(B \log(e(a+bx)^n(c+dx)^{-n}) + A)}{Bn(bc-ad)}$$

Antiderivative was successfully verified.

[In] Int[1/((a + b\*x)\*(c + d\*x)\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])),x]

[Out] Log[A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]]/(B\*(b\*c - a\*d)\*n)

**Rule 6684**

Int[(u\_)/(y\_), x\_Symbol] :> With[{q = DerivativeDivides[y, u, x]}, Simp[q\*Log[RemoveContent[y, x]], x] /; !FalseQ[q]]

**Rubi steps**

$$\int \frac{1}{(a+bx)(c+dx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))} dx = \frac{\log(A + B \log(e(a+bx)^n(c+dx)^{-n}))}{B(bc-ad)n}$$

**Mathematica [A]** time = 0.0512614, size = 39, normalized size = 0.95

$$\frac{\log(B \log(e(a+bx)^n(c+dx)^{-n}) + A)}{bBcn - aBdn}$$

Antiderivative was successfully verified.

[In] Integrate[1/((a + b\*x)\*(c + d\*x)\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])), x]

[Out] Log[A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]]/(b\*B\*c\*n - a\*B\*d\*n)

**Maple [C]** time = 0.069, size = 368, normalized size = 9.

$$-\frac{1}{Bn(ad-bc)} \ln \left( \ln \left( (dx+c)^n \right) - \frac{1}{2B} \left( -iB\pi \operatorname{csgn}(ie) \operatorname{csgn} \left( \frac{i(bx+a)^n}{(dx+c)^n} \right) \operatorname{csgn} \left( \frac{ie(bx+a)^n}{(dx+c)^n} \right) + iB\pi \operatorname{csgn}(ie) \operatorname{csgn} \left( \frac{ie(bx+a)^n}{(dx+c)^n} \right) \right) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(b\*x+a)/(d\*x+c)/(A+B\*ln(e\*(b\*x+a)^n/((d\*x+c)^n))), x)

[Out] 
$$-1/B/n/(a*d-b*c)*\ln(\ln((d*x+c)^n)-1/2*(-I*B*Pi*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+I*B*Pi*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-I*B*Pi*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))+I*B*Pi*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*B*Pi*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-I*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+I*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-I*B*Pi*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+2*B*\ln(e)+2*B*\ln((b*x+a)^n)+2*A)/B$$

**Maxima [A]** time = 1.50589, size = 66, normalized size = 1.61

$$\frac{\log \left( -\frac{B \log((bx+a)^n) - B \log((dx+c)^n) + B \log(e) + A}{B} \right)}{(bcn - adn)B}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b\*x+a)/(d\*x+c)/(A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n))), x, algorithm="maxima")

[Out] log(-(B\*log((b\*x + a)^n) - B\*log((d\*x + c)^n) + B\*log(e) + A)/B)/((b\*c\*n - a\*d\*n)\*B)

**Fricas [A]** time = 0.508597, size = 105, normalized size = 2.56

$$\frac{\log(-Bn \log(bx + a) + Bn \log(dx + c) - B \log(e) - A)}{(Bbc - Bad)n}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b\*x+a)/(d\*x+c)/(A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n))),x, algorithm="fricas")

[Out] log(-B\*n\*log(b\*x + a) + B\*n\*log(d\*x + c) - B\*log(e) - A)/((B\*b\*c - B\*a\*d)\*n)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b\*x+a)/(d\*x+c)/(A+B\*ln(e\*(b\*x+a)\*\*n/((d\*x+c)\*\*n))),x)

[Out] Timed out

**Giac [A]** time = 1.16894, size = 51, normalized size = 1.24

$$\frac{\log(Bn \log(bx + a) - Bn \log(dx + c) + A + B)}{Bbcn - Badn}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b\*x+a)/(d\*x+c)/(A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n))),x, algorithm="giac")

[Out] log(B\*n\*log(b\*x + a) - B\*n\*log(d\*x + c) + A + B)/(B\*b\*c\*n - B\*a\*d\*n)

$$3.238 \quad \int \frac{1}{(af+bf x)(cg+dg x)(A+B \log(e(a+bx)^n(c+dx)^{-n}))} dx$$

**Optimal.** Leaf size=47

$$\frac{\log(B \log(e(a+bx)^n(c+dx)^{-n}) + A)}{Bfgn(bc-ad)}$$

[Out] Log[A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]]/(B\*(b\*c - a\*d)\*f\*g\*n)

**Rubi [A]** time = 0.165762, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 46,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.022$ , Rules used = {6684}

$$\frac{\log(B \log(e(a+bx)^n(c+dx)^{-n}) + A)}{Bfgn(bc-ad)}$$

Antiderivative was successfully verified.

[In] Int[1/((a\*f + b\*f\*x)\*(c\*g + d\*g\*x)\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]),x]

[Out] Log[A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]]/(B\*(b\*c - a\*d)\*f\*g\*n)

**Rule 6684**

Int[(u\_)/(y\_), x\_Symbol] :> With[{q = DerivativeDivides[y, u, x]}, Simp[q\*Log[RemoveContent[y, x]], x] /; !FalseQ[q]]

**Rubi steps**

$$\int \frac{1}{(af + bf x)(cg + dg x)(A + B \log(e(a+bx)^n(c+dx)^{-n}))} dx = \frac{\log(A + B \log(e(a+bx)^n(c+dx)^{-n}))}{B(bc-ad)fgn}$$

**Mathematica [A]** time = 0.123151, size = 43, normalized size = 0.91

$$\frac{\log(B \log(e(a+bx)^n(c+dx)^{-n}) + A)}{bBc fgn - aBd fgn}$$

Antiderivative was successfully verified.

[In] Integrate[1/((a\*f + b\*f\*x)\*(c\*g + d\*g\*x)\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])),x]

[Out] Log[A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]]/(b\*B\*c\*f\*g\*n - a\*B\*d\*f\*g\*n)

**Maple [C]** time = 0.426, size = 374, normalized size = 8.

$$-\frac{1}{Bfgn(ad-bc)} \ln \left( \ln \left( (dx+c)^n \right) - \frac{1}{2B} \left( -iB\pi \operatorname{csgn}(ie) \operatorname{csgn} \left( \frac{i(bx+a)^n}{(dx+c)^n} \right) \operatorname{csgn} \left( \frac{ie(bx+a)^n}{(dx+c)^n} \right) + iB\pi \operatorname{csgn}(ie) \left( \operatorname{csgn} \left( \frac{i(bx+a)^n}{(dx+c)^n} \right) \right) \right) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(b\*f\*x+a\*f)/(d\*g\*x+c\*g)/(A+B\*ln(e\*(b\*x+a)^n/((d\*x+c)^n))),x)

[Out] 
$$-1/B/f/g/n/(a*d-b*c) * \ln \left( \ln \left( (d*x+c)^n \right) - 1/2 * \left( -I*B*Pi * \operatorname{csgn}(I*e) * \operatorname{csgn}(I*(b*x+a)^n / ((d*x+c)^n)) * \operatorname{csgn}(I*e / ((d*x+c)^n) * (b*x+a)^n) + I*B*Pi * \operatorname{csgn}(I*e) * \operatorname{csgn}(I*e / ((d*x+c)^n) * (b*x+a)^n) - I*B*Pi * \operatorname{csgn}(I*(b*x+a)^n) * \operatorname{csgn}(I / ((d*x+c)^n)) * \operatorname{csgn}(I*(b*x+a)^n / ((d*x+c)^n)) + I*B*Pi * \operatorname{csgn}(I*(b*x+a)^n) * \operatorname{csgn}(I*(b*x+a)^n / ((d*x+c)^n)) \right) \right)^2 + I*B*Pi * \operatorname{csgn}(I / ((d*x+c)^n)) * \operatorname{csgn}(I*(b*x+a)^n / ((d*x+c)^n)) - I*B*Pi * \operatorname{csgn}(I*(b*x+a)^n / ((d*x+c)^n)) \wedge 3 + I*B*Pi * \operatorname{csgn}(I*(b*x+a)^n / ((d*x+c)^n)) * \operatorname{csgn}(I*e / ((d*x+c)^n) * (b*x+a)^n) - I*B*Pi * \operatorname{csgn}(I*e / ((d*x+c)^n) * (b*x+a)^n) \wedge 3 + 2*B*ln(e) + 2*B*ln((b*x+a)^n) + 2*A) / B$$

**Maxima [A]** time = 1.73882, size = 72, normalized size = 1.53

$$\frac{\log \left( -\frac{B \log((bx+a)^n) - B \log((dx+c)^n) + B \log(e) + A}{B} \right)}{(bcfgn - adfgn)B}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b\*f\*x+a\*f)/(d\*g\*x+c\*g)/(A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n))),x, algorithm="maxima")

[Out] log(-(B\*log((b\*x + a)^n) - B\*log((d\*x + c)^n) + B\*log(e) + A)/B)/((b\*c\*f\*g\*n - a\*d\*f\*g\*n)\*B)

**Fricas [A]** time = 0.513459, size = 111, normalized size = 2.36

$$\frac{\log(-Bn \log(bx + a) + Bn \log(dx + c) - B \log(e) - A)}{(Bbc - Bad)fgn}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b\*f\*x+a\*f)/(d\*g\*x+c\*g)/(A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n))),x, algorithm="fricas")

[Out] log(-B\*n\*log(b\*x + a) + B\*n\*log(d\*x + c) - B\*log(e) - A)/((B\*b\*c - B\*a\*d)\*f\*g\*n)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b\*f\*x+a\*f)/(d\*g\*x+c\*g)/(A+B\*ln(e\*(b\*x+a)\*\*n/((d\*x+c)\*\*n))),x)

[Out] Timed out

**Giac [A]** time = 1.21471, size = 57, normalized size = 1.21

$$\frac{\log(Bn \log(bx + a) - Bn \log(dx + c) + A + B)}{Bbcfgn - Badfgn}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b\*f\*x+a\*f)/(d\*g\*x+c\*g)/(A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n))),x, algorithm="giac")

[Out] log(B\*n\*log(b\*x + a) - B\*n\*log(d\*x + c) + A + B)/(B\*b\*c\*f\*g\*n - B\*a\*d\*f\*g\*n)



$$3.239 \quad \int \frac{1}{(acf + (bc + ad)fx + bdfx^2)(A + B \log(e(a + bx)^n(c + dx)^{-n}))} dx$$

Optimal. Leaf size=44

$$\frac{\log(B \log(e(a + bx)^n(c + dx)^{-n}) + A)}{Bfn(bc - ad)}$$

[Out] Log[A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]]/(B\*(b\*c - a\*d)\*f\*n)

**Rubi [A]** time = 0.0775872, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 50,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.02$ , Rules used = {6684}

$$\frac{\log(B \log(e(a + bx)^n(c + dx)^{-n}) + A)}{Bfn(bc - ad)}$$

Antiderivative was successfully verified.

[In] Int[1/((a\*c\*f + (b\*c + a\*d)\*f\*x + b\*d\*f\*x^2)\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])),x]

[Out] Log[A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]]/(B\*(b\*c - a\*d)\*f\*n)

Rule 6684

Int[(u\_)/(y\_), x\_Symbol] :> With[{q = DerivativeDivides[y, u, x]}, Simp[q\*L  
og[RemoveContent[y, x]], x] /; !FalseQ[q]]

Rubi steps

$$\int \frac{1}{(acf + (bc + ad)fx + bdfx^2)(A + B \log(e(a + bx)^n(c + dx)^{-n}))} dx = \frac{\log(A + B \log(e(a + bx)^n(c + dx)^{-n}))}{B(bc - ad)fn}$$

**Mathematica [A]** time = 0.0544395, size = 42, normalized size = 0.95

$$\frac{\log(B \log(e(a + bx)^n(c + dx)^{-n}) + A)}{f(bBcn - aBdn)}$$

Antiderivative was successfully verified.

[In] Integrate[1/((a\*c\*f + (b\*c + a\*d)\*f\*x + b\*d\*f\*x^2)\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])),x]

[Out] Log[A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]]/(f\*(b\*B\*c\*n - a\*B\*d\*n))

**Maple [C]** time = 0.418, size = 371, normalized size = 8.4

$$-\frac{1}{Bfn(ad-bc)} \ln \left( \ln \left( (dx+c)^n \right) - \frac{1}{2B} \left( -iB\pi \operatorname{csgn}(ie) \operatorname{csgn} \left( \frac{i(bx+a)^n}{(dx+c)^n} \right) \operatorname{csgn} \left( \frac{ie(bx+a)^n}{(dx+c)^n} \right) + iB\pi \operatorname{csgn}(ie) \left( \operatorname{csgn} \left( \frac{ie}{(dx+c)^n} \right) \right) \right) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(a\*c\*f+(a\*d+b\*c)\*f\*x+b\*d\*f\*x^2)/(A+B\*ln(e\*(b\*x+a)^n/((d\*x+c)^n))),x)

[Out] 
$$-1/B/f/n/(a*d-b*c)*\ln(\ln((d*x+c)^n)-1/2*(-I*B*Pi*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+I*B*Pi*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-I*B*Pi*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))+I*B*Pi*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*B*Pi*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-I*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+I*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-I*B*Pi*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+2*B*ln(e)+2*B*ln((b*x+a)^n)+2*A)/B$$

**Maxima [A]** time = 1.78736, size = 69, normalized size = 1.57

$$\frac{\log \left( -\frac{B \log((bx+a)^n) - B \log((dx+c)^n) + B \log(e) + A}{B} \right)}{(bcfn - adfn)B}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(a\*c\*f+(a\*d+b\*c)\*f\*x+b\*d\*f\*x^2)/(A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n))),x, algorithm="maxima")

[Out] log(-(B\*log((b\*x + a)^n) - B\*log((d\*x + c)^n) + B\*log(e) + A)/B)/((b\*c\*f\*n - a\*d\*f\*n)\*B)

---

**Fricas [A]** time = 0.487774, size = 108, normalized size = 2.45

$$\frac{\log(-Bn \log(bx + a) + Bn \log(dx + c) - B \log(e) - A)}{(Bbc - Bad)fn}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(a\*c\*f+(a\*d+b\*c)\*f\*x+b\*d\*f\*x^2)/(A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n))),x, algorithm="fricas")

[Out] log(-B\*n\*log(b\*x + a) + B\*n\*log(d\*x + c) - B\*log(e) - A)/((B\*b\*c - B\*a\*d)\*f\*n)

---

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(a\*c\*f+(a\*d+b\*c)\*f\*x+b\*d\*f\*x\*\*2)/(A+B\*ln(e\*(b\*x+a)\*\*n/((d\*x+c)\*n))),x)

[Out] Timed out

---

**Giac [A]** time = 1.22325, size = 54, normalized size = 1.23

$$\frac{\log(Bn \log(bx + a) - Bn \log(dx + c) + A + B)}{Bbcfn - Badfn}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(a\*c\*f+(a\*d+b\*c)\*f\*x+b\*d\*f\*x^2)/(A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n))),x, algorithm="giac")

[Out] log(B\*n\*log(b\*x + a) - B\*n\*log(d\*x + c) + A + B)/(B\*b\*c\*f\*n - B\*a\*d\*f\*n)

$$3.240 \quad \int \frac{(a+bx)^m(c+dx)^{-2-m}}{\log(e(a+bx)^n(c+dx)^{-n})} dx$$

**Optimal.** Leaf size=88

$$\frac{(a+bx)^{m+1}(c+dx)^{-m-1}(e(a+bx)^n(c+dx)^{-n})^{-\frac{m+1}{n}} \operatorname{Ei}\left(\frac{(m+1)\log(e(a+bx)^n(c+dx)^{-n})}{n}\right)}{n(bc-ad)}$$

[Out] ((a + b\*x)^(1 + m)\*(c + d\*x)^(-1 - m)\*ExpIntegralEi[((1 + m)\*Log[(e\*(a + b\*x)^n]/(c + d\*x)^n)]/n)/((b\*c - a\*d)\*n\*((e\*(a + b\*x)^n)/(c + d\*x)^n)^((1 + m)/n))

**Rubi [A]** time = 0.10988, antiderivative size = 88, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.025$ , Rules used = {2510}

$$\frac{(a+bx)^{m+1}(c+dx)^{-m-1}(e(a+bx)^n(c+dx)^{-n})^{-\frac{m+1}{n}} \operatorname{Ei}\left(\frac{(m+1)\log(e(a+bx)^n(c+dx)^{-n})}{n}\right)}{n(bc-ad)}$$

Antiderivative was successfully verified.

[In] Int[((a + b\*x)^m\*(c + d\*x)^(-2 - m))/Log[(e\*(a + b\*x)^n]/(c + d\*x)^n], x]

[Out] ((a + b\*x)^(1 + m)\*(c + d\*x)^(-1 - m)\*ExpIntegralEi[((1 + m)\*Log[(e\*(a + b\*x)^n]/(c + d\*x)^n)]/n)/((b\*c - a\*d)\*n\*((e\*(a + b\*x)^n)/(c + d\*x)^n)^((1 + m)/n))

### Rule 2510

```
Int[(((a_.) + (b_.)*(x_.))^(m_.)*((c_.) + (d_.)*(x_.))^(n_.))/Log[(e_.)*((f_.)
)*((a_.) + (b_.)*(x_.))^(p_.)*((c_.) + (d_.)*(x_.))^(q_.)]^(r_.)], x_Symbol]
:> Simp[((a + b*x)^(m + 1)*(c + d*x)^(n + 1)*ExpIntegralEi[((m + 1)*Log[e*(
f*(a + b*x)^p*(c + d*x)^q]^r)]/(p*r))]/(p*r*(b*c - a*d)*(e*(f*(a + b*x)^p*(
c + d*x)^q)^r)^((m + 1)/(p*r))), x] /; FreeQ[{a, b, c, d, e, f, m, n, p, q,
r}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ[m + n + 2, 0] && NeQ[m
, -1]
```

### Rubi steps

$$\int \frac{(a+bx)^m (c+dx)^{-2-m}}{\log(e(a+bx)^n (c+dx)^{-n})} dx = \frac{(a+bx)^{1+m} (c+dx)^{-1-m} (e(a+bx)^n (c+dx)^{-n})^{-\frac{1+m}{n}} \operatorname{Ei}\left(\frac{(1+m)\log(e(a+bx)^n (c+dx)^{-n})}{n}\right)}{(bc-ad)n}$$

**Mathematica [F]** time = 0.359671, size = 0, normalized size = 0.

$$\int \frac{(a+bx)^m (c+dx)^{-2-m}}{\log(e(a+bx)^n (c+dx)^{-n})} dx$$

Verification is Not applicable to the result.

[In] Integrate[((a + b\*x)^m\*(c + d\*x)^(-2 - m))/Log[(e\*(a + b\*x)^n)/(c + d\*x)^n], x]

[Out] Integrate[((a + b\*x)^m\*(c + d\*x)^(-2 - m))/Log[(e\*(a + b\*x)^n)/(c + d\*x)^n], x]

**Maple [F]** time = 1.237, size = 0, normalized size = 0.

$$\int (bx+a)^m (dx+c)^{-2-m} \left( \ln \left( \frac{e(bx+a)^n}{(dx+c)^n} \right) \right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*x+a)^m\*(d\*x+c)^(-2-m)/ln(e\*(b\*x+a)^n/((d\*x+c)^n)), x)

[Out] int((b\*x+a)^m\*(d\*x+c)^(-2-m)/ln(e\*(b\*x+a)^n/((d\*x+c)^n)), x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx+a)^m (dx+c)^{-m-2}}{\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*x+a)^m\*(d\*x+c)^(-2-m)/log(e\*(b\*x+a)^n/((d\*x+c)^n)),x, algorithm="maxima")

[Out] integrate((b\*x + a)^m\*(d\*x + c)^(-m - 2)/log((b\*x + a)^n\*e/(d\*x + c)^n), x)

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{(bx + a)^m (dx + c)^{-m-2}}{\log \left( \frac{(bx+a)^n e}{(dx+c)^n} \right)}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*x+a)^m\*(d\*x+c)^(-2-m)/log(e\*(b\*x+a)^n/((d\*x+c)^n)),x, algorithm="fricas")

[Out] integral((b\*x + a)^m\*(d\*x + c)^(-m - 2)/log((b\*x + a)^n\*e/(d\*x + c)^n), x)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*x+a)\*\*m\*(d\*x+c)\*\*(-2-m)/ln(e\*(b\*x+a)\*\*n/((d\*x+c)\*\*n)),x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx + a)^m (dx + c)^{-m-2}}{\log \left( \frac{(bx+a)^n e}{(dx+c)^n} \right)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^m*(d*x+c)^(-2-m)/log(e*(b*x+a)^n/((d*x+c)^n)),x, algorithm  
m="giac")
```

```
[Out] integrate((b*x + a)^m*(d*x + c)^(-m - 2)/log((b*x + a)^n*e/(d*x + c)^n), x)
```

$$3.241 \quad \int \frac{(a+bx)^3}{(c+dx)^5 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx$$

**Optimal.** Leaf size=75

$$\frac{(a+bx)^4 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-4/n} \operatorname{Ei}\left(\frac{4 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(c+dx)^4(bc-ad)}$$

[Out] ((a + b\*x)^4\*ExpIntegralEi[(4\*Log[e\*((a + b\*x)/(c + d\*x))^n])/n])/((b\*c - a\*d)\*n\*(e\*((a + b\*x)/(c + d\*x))^n)^(4/n)\*(c + d\*x)^4)

**Rubi [A]** time = 0.0753523, antiderivative size = 75, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 35,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.029$ , Rules used = {2510}

$$\frac{(a+bx)^4 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-4/n} \operatorname{Ei}\left(\frac{4 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(c+dx)^4(bc-ad)}$$

Antiderivative was successfully verified.

[In] Int[(a + b\*x)^3/((c + d\*x)^5\*Log[e\*((a + b\*x)/(c + d\*x))^n]),x]

[Out] ((a + b\*x)^4\*ExpIntegralEi[(4\*Log[e\*((a + b\*x)/(c + d\*x))^n])/n])/((b\*c - a\*d)\*n\*(e\*((a + b\*x)/(c + d\*x))^n)^(4/n)\*(c + d\*x)^4)

### Rule 2510

Int[(((a\_.) + (b\_.)\*(x\_))^(m\_.)\*((c\_.) + (d\_.)\*(x\_))^(n\_.))/Log[(e\_.)\*((f\_.)\*(a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)], x\_Symbol] :> Simp[((a + b\*x)^(m + 1)\*(c + d\*x)^(n + 1)\*ExpIntegralEi[((m + 1)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r)^(m + 1)])/((p\*r)\*(b\*c - a\*d)\*(e\*(f\*(a + b\*x)^p\*(c + d\*x)^q)^r)^(m + 1)/(p\*r))), x] /; FreeQ[{a, b, c, d, e, f, m, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && EqQ[m + n + 2, 0] && NeQ[m, -1]

### Rubi steps



$$\int \frac{(a+bx)^3}{(c+dx)^5 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx = \frac{(a+bx)^4 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-4/n} \operatorname{Ei}\left(\frac{4 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc-ad)n(c+dx)^4}$$

**Mathematica [A]** time = 0.0266898, size = 75, normalized size = 1.

$$\frac{(a+bx)^4 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-4/n} \operatorname{Ei}\left(\frac{4 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(c+dx)^4(bc-ad)}$$

Antiderivative was successfully verified.

[In] Integrate[(a + b\*x)^3/((c + d\*x)^5\*Log[e\*((a + b\*x)/(c + d\*x))^n]),x]

[Out] ((a + b\*x)^4\*ExpIntegralEi[(4\*Log[e\*((a + b\*x)/(c + d\*x))^n])/n])/((b\*c - a\*d)\*n\*(e\*((a + b\*x)/(c + d\*x))^n)^(4/n)\*(c + d\*x)^4)

**Maple [F]** time = 0.809, size = 0, normalized size = 0.

$$\int \frac{(bx+a)^3}{(dx+c)^5} \left( \ln \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) \right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*x+a)^3/(d\*x+c)^5/ln(e\*((b\*x+a)/(d\*x+c))^n),x)

[Out] int((b\*x+a)^3/(d\*x+c)^5/ln(e\*((b\*x+a)/(d\*x+c))^n),x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx+a)^3}{(dx+c)^5 \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*x+a)^3/(d\*x+c)^5/log(e\*((b\*x+a)/(d\*x+c))^n),x, algorithm="maxima")

[Out] integrate((b\*x + a)^3/((d\*x + c)^5\*log(e\*((b\*x + a)/(d\*x + c))^n)), x)

**Fricas [A]** time = 0.483609, size = 220, normalized size = 2.93

$$\frac{\log\_integral\left(\frac{(b^4x^4+4ab^3x^3+6a^2b^2x^2+4a^3bx+a^4)e^{\frac{4}{n}}}{d^4x^4+4cd^3x^3+6c^2d^2x^2+4c^3dx+c^4}\right)}{(bc-ad)e^{\frac{4}{n}}n}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*x+a)^3/(d\*x+c)^5/log(e\*((b\*x+a)/(d\*x+c))^n),x, algorithm="fricas")

[Out] log\_integral((b^4\*x^4 + 4\*a\*b^3\*x^3 + 6\*a^2\*b^2\*x^2 + 4\*a^3\*b\*x + a^4)\*e^(4/n)/(d^4\*x^4 + 4\*c\*d^3\*x^3 + 6\*c^2\*d^2\*x^2 + 4\*c^3\*d\*x + c^4))/((b\*c - a\*d)\*e^(4/n)\*n)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*x+a)\*\*3/(d\*x+c)\*\*5/ln(e\*((b\*x+a)/(d\*x+c))\*\*n),x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx+a)^3}{(dx+c)^5 \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^3/(d*x+c)^5/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="giac")
```

```
[Out] integrate((b*x + a)^3/((d*x + c)^5*log(e*((b*x + a)/(d*x + c))^n)), x)
```

$$3.242 \quad \int \frac{(a+bx)^2}{(c+dx)^4 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx$$

**Optimal.** Leaf size=75

$$\frac{(a+bx)^3 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-3/n} \operatorname{Ei}\left(\frac{3 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(c+dx)^3(bc-ad)}$$

[Out] ((a + b\*x)^3\*ExpIntegralEi[(3\*Log[e\*((a + b\*x)/(c + d\*x))^n])/n])/((b\*c - a\*d)\*n\*(e\*((a + b\*x)/(c + d\*x))^n)^(3/n)\*(c + d\*x)^3)

**Rubi [A]** time = 0.0731964, antiderivative size = 75, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 35,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.029$ , Rules used = {2510}

$$\frac{(a+bx)^3 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-3/n} \operatorname{Ei}\left(\frac{3 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(c+dx)^3(bc-ad)}$$

Antiderivative was successfully verified.

[In] Int[(a + b\*x)^2/((c + d\*x)^4\*Log[e\*((a + b\*x)/(c + d\*x))^n]),x]

[Out] ((a + b\*x)^3\*ExpIntegralEi[(3\*Log[e\*((a + b\*x)/(c + d\*x))^n])/n])/((b\*c - a\*d)\*n\*(e\*((a + b\*x)/(c + d\*x))^n)^(3/n)\*(c + d\*x)^3)

### Rule 2510

Int[(((a\_.) + (b\_.)\*(x\_))^(m\_.)\*((c\_.) + (d\_.)\*(x\_))^(n\_.))/Log[(e\_.)\*((f\_.)\*(a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)], x\_Symbol] :> Simp[((a + b\*x)^(m + 1)\*(c + d\*x)^(n + 1)\*ExpIntegralEi[((m + 1)\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r)]/(p\*r))]/(p\*r\*(b\*c - a\*d)\*(e\*(f\*(a + b\*x)^p\*(c + d\*x)^q)^r)^((m + 1)/(p\*r)), x] /; FreeQ[{a, b, c, d, e, f, m, n, p, q, r}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && EqQ[m + n + 2, 0] && NeQ[m, -1]

### Rubi steps

$$\int \frac{(a+bx)^2}{(c+dx)^4 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx = \frac{(a+bx)^3 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-3/n} \operatorname{Ei}\left(\frac{3 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc-ad)n(c+dx)^3}$$

**Mathematica [A]** time = 0.0240413, size = 75, normalized size = 1.

$$\frac{(a+bx)^3 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-3/n} \operatorname{Ei}\left(\frac{3 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(c+dx)^3(bc-ad)}$$

Antiderivative was successfully verified.

[In] Integrate[(a + b\*x)^2/((c + d\*x)^4\*Log[e\*((a + b\*x)/(c + d\*x))^n]),x]

[Out] ((a + b\*x)^3\*ExpIntegralEi[(3\*Log[e\*((a + b\*x)/(c + d\*x))^n])/n])/((b\*c - a\*d)\*n\*(e\*((a + b\*x)/(c + d\*x))^n)^(3/n)\*(c + d\*x)^3)

**Maple [F]** time = 0.643, size = 0, normalized size = 0.

$$\int \frac{(bx+a)^2}{(dx+c)^4} \left( \ln \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) \right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*x+a)^2/(d\*x+c)^4/ln(e\*((b\*x+a)/(d\*x+c))^n),x)

[Out] int((b\*x+a)^2/(d\*x+c)^4/ln(e\*((b\*x+a)/(d\*x+c))^n),x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx+a)^2}{(dx+c)^4 \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*x+a)^2/(d\*x+c)^4/log(e\*((b\*x+a)/(d\*x+c))^n),x, algorithm="maxima")

[Out] integrate((b\*x + a)^2/((d\*x + c)^4\*log(e\*((b\*x + a)/(d\*x + c))^n)), x)

**Fricas [A]** time = 0.475508, size = 177, normalized size = 2.36

$$\frac{\log\_integral\left(\frac{(b^3x^3+3ab^2x^2+3a^2bx+a^3)e^{\frac{3}{n}}}{d^3x^3+3cd^2x^2+3c^2dx+c^3}\right)}{(bc-ad)e^{\frac{3}{n}}n}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*x+a)^2/(d\*x+c)^4/log(e\*((b\*x+a)/(d\*x+c))^n),x, algorithm="fricas")

[Out] log\_integral((b^3\*x^3 + 3\*a\*b^2\*x^2 + 3\*a^2\*b\*x + a^3)\*e^(3/n)/(d^3\*x^3 + 3\*c\*d^2\*x^2 + 3\*c^2\*d\*x + c^3))/((b\*c - a\*d)\*e^(3/n)\*n)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*x+a)\*\*2/(d\*x+c)\*\*4/ln(e\*((b\*x+a)/(d\*x+c))\*\*n),x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx+a)^2}{(dx+c)^4 \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2/(d*x+c)^4/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="giac")
```

```
[Out] integrate((b*x + a)^2/((d*x + c)^4*log(e*((b*x + a)/(d*x + c))^n)), x)
```

$$3.243 \quad \int \frac{a+bx}{(c+dx)^3 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx$$

**Optimal.** Leaf size=75

$$\frac{(a+bx)^2 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-2/n} \operatorname{Ei}\left(\frac{2\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(c+dx)^2(bc-ad)}$$

[Out] ((a + b\*x)^2\*ExpIntegralEi[(2\*Log[e\*((a + b\*x)/(c + d\*x))^n])/n])/((b\*c - a\*d)\*n\*(e\*((a + b\*x)/(c + d\*x))^n)^(2/n)\*(c + d\*x)^2)

**Rubi [A]** time = 0.0496571, antiderivative size = 75, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 33,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.03$ , Rules used = {2510}

$$\frac{(a+bx)^2 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-2/n} \operatorname{Ei}\left(\frac{2\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(c+dx)^2(bc-ad)}$$

Antiderivative was successfully verified.

[In] Int[(a + b\*x)/((c + d\*x)^3\*Log[e\*((a + b\*x)/(c + d\*x))^n]),x]

[Out] ((a + b\*x)^2\*ExpIntegralEi[(2\*Log[e\*((a + b\*x)/(c + d\*x))^n])/n])/((b\*c - a\*d)\*n\*(e\*((a + b\*x)/(c + d\*x))^n)^(2/n)\*(c + d\*x)^2)

### Rule 2510

```
Int[(((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.))/Log[(e_.)*((f_.
)*(a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)]^(r_.)], x_Symbol]
:> Simp[((a + b*x)^(m + 1)*(c + d*x)^(n + 1)*ExpIntegralEi[((m + 1)*Log[e*(
f*(a + b*x)^p*(c + d*x)^q]^r)]/(p*r))]/(p*r*(b*c - a*d)*(e*(f*(a + b*x)^p*(
c + d*x)^q)^r)^((m + 1)/(p*r))), x] /; FreeQ[{a, b, c, d, e, f, m, n, p, q,
r}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ[m + n + 2, 0] && NeQ[m
, -1]
```

### Rubi steps



$$\int \frac{a + bx}{(c + dx)^3 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx = \frac{(a + bx)^2 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-2/n} \operatorname{Ei}\left(\frac{2 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc - ad)n(c + dx)^2}$$

**Mathematica [A]** time = 0.0197561, size = 75, normalized size = 1.

$$\frac{(a + bx)^2 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-2/n} \operatorname{Ei}\left(\frac{2 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(c + dx)^2(bc - ad)}$$

Antiderivative was successfully verified.

[In] Integrate[(a + b\*x)/((c + d\*x)^3\*Log[e\*((a + b\*x)/(c + d\*x))^n]),x]

[Out] ((a + b\*x)^2\*ExpIntegralEi[(2\*Log[e\*((a + b\*x)/(c + d\*x))^n])/n])/((b\*c - a\*d)\*n\*(e\*((a + b\*x)/(c + d\*x))^n)^(2/n)\*(c + d\*x)^2)

**Maple [F]** time = 0.457, size = 0, normalized size = 0.

$$\int \frac{bx + a}{(dx + c)^3} \left( \ln \left( e \left( \frac{bx + a}{dx + c} \right)^n \right) \right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b\*x+a)/(d\*x+c)^3/ln(e\*((b\*x+a)/(d\*x+c))^n),x)

[Out] int((b\*x+a)/(d\*x+c)^3/ln(e\*((b\*x+a)/(d\*x+c))^n),x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{bx + a}{(dx + c)^3 \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*x+a)/(d\*x+c)^3/log(e\*((b\*x+a)/(d\*x+c))^n),x, algorithm="maxima")

[Out] integrate((b\*x + a)/((d\*x + c)^3\*log(e\*((b\*x + a)/(d\*x + c))^n)), x)

**Fricas [A]** time = 0.503823, size = 134, normalized size = 1.79

$$\frac{\log\_integral\left(\frac{(b^2x^2+2abx+a^2)e^{\frac{2}{n}}}{d^2x^2+2cdx+c^2}\right)}{(bc-ad)e^{\frac{2}{n}}n}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*x+a)/(d\*x+c)^3/log(e\*((b\*x+a)/(d\*x+c))^n),x, algorithm="fricas")

[Out] log\_integral((b^2\*x^2 + 2\*a\*b\*x + a^2)\*e^(2/n)/(d^2\*x^2 + 2\*c\*d\*x + c^2))/(b\*c - a\*d)\*e^(2/n)\*n

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b\*x+a)/(d\*x+c)\*\*3/ln(e\*((b\*x+a)/(d\*x+c))\*\*n),x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{bx+a}{(dx+c)^3 \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)/(d*x+c)^3/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="giac")
```

```
[Out] integrate((b*x + a)/((d*x + c)^3*log(e*((b*x + a)/(d*x + c))^n)), x)
```

$$3.244 \quad \int \frac{1}{(c+dx)^2 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx$$

**Optimal.** Leaf size=72

$$\frac{(a+bx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-1/n} \operatorname{Ei}\left(\frac{\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(c+dx)(bc-ad)}$$

[Out] ((a + b\*x)\*ExpIntegralEi[Log[e\*((a + b\*x)/(c + d\*x))^n]/n])/((b\*c - a\*d)\*n\*(e\*((a + b\*x)/(c + d\*x))^n)^n^(-1)\*(c + d\*x))

**Rubi [A]** time = 0.0315986, antiderivative size = 72, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 28,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.036$ , Rules used = {2493}

$$\frac{(a+bx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-1/n} \operatorname{Ei}\left(\frac{\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(c+dx)(bc-ad)}$$

Antiderivative was successfully verified.

[In] Int[1/((c + d\*x)^2\*Log[e\*((a + b\*x)/(c + d\*x))^n]),x]

[Out] ((a + b\*x)\*ExpIntegralEi[Log[e\*((a + b\*x)/(c + d\*x))^n]/n])/((b\*c - a\*d)\*n\*(e\*((a + b\*x)/(c + d\*x))^n)^n^(-1)\*(c + d\*x))

### Rule 2493

Int[1/(Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^r\_.]\*((g\_.) + (h\_.)\*(x\_))^2), x\_Symbol] := Simp[(b\*(c + d\*x)\*(e\*(f\*(a + b\*x)^p\*(c + d\*x)^q)^r)^(1/(p\*r))\*ExpIntegralEi[-(Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r)/(p\*r)]]/(h\*p\*r\*(b\*c - a\*d)\*(g + h\*x)), x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && EqQ[b\*g - a\*h, 0]

### Rubi steps

$$\int \frac{1}{(c + dx)^2 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx = \frac{(a + bx) \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-1/n} \operatorname{Ei}\left(\frac{\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc - ad)n(c + dx)}$$

**Mathematica [A]** time = 0.0707403, size = 72, normalized size = 1.

$$\frac{(a + bx) \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-1/n} \operatorname{Ei}\left(\frac{\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(c + dx)(bc - ad)}$$

Antiderivative was successfully verified.

[In] Integrate[1/((c + d\*x)^2\*Log[e\*((a + b\*x)/(c + d\*x))^n]),x]

[Out] ((a + b\*x)\*ExpIntegralEi[Log[e\*((a + b\*x)/(c + d\*x))^n]/n])/((b\*c - a\*d)\*n\*(e\*((a + b\*x)/(c + d\*x))^n)^(-1)\*(c + d\*x))

**Maple [F]** time = 0.457, size = 0, normalized size = 0.

$$\int \frac{1}{(dx + c)^2} \left( \ln\left(e\left(\frac{bx + a}{dx + c}\right)^n\right) \right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(d\*x+c)^2/ln(e\*((b\*x+a)/(d\*x+c))^n),x)

[Out] int(1/(d\*x+c)^2/ln(e\*((b\*x+a)/(d\*x+c))^n),x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(dx + c)^2 \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(d\*x+c)^2/log(e\*((b\*x+a)/(d\*x+c))^n),x, algorithm="maxima")

[Out] integrate(1/((d\*x + c)^2\*log(e\*((b\*x + a)/(d\*x + c))^n)), x)

**Fricas [A]** time = 0.456603, size = 90, normalized size = 1.25

$$\frac{\log\_integral\left(\frac{(bx+a)e^{\left(\frac{1}{n}\right)}}{dx+c}\right)}{(bc-ad)e^{\left(\frac{1}{n}\right)}n}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(d\*x+c)^2/log(e\*((b\*x+a)/(d\*x+c))^n),x, algorithm="fricas")

[Out] log\_integral((b\*x + a)\*e^(1/n)/(d\*x + c))/((b\*c - a\*d)\*e^(1/n)\*n)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(d\*x+c)\*\*2/ln(e\*((b\*x+a)/(d\*x+c))\*\*n),x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(dx+c)^2 \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*x+c)^2/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="giac")
```

```
[Out] integrate(1/((d*x + c)^2*log(e*((b*x + a)/(d*x + c))^n)), x)
```

$$3.245 \quad \int \frac{1}{(a+bx)(c+dx) \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx$$

**Optimal.** Leaf size=33

$$\frac{\log\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{n(bc-ad)}$$

[Out] Log[Log[e\*((a + b\*x)/(c + d\*x))^n]]/((b\*c - a\*d)\*n)

**Rubi [A]** time = 0.0749734, antiderivative size = 33, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 35,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.029$ , Rules used = {2504}

$$\frac{\log\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{n(bc-ad)}$$

Antiderivative was successfully verified.

[In] Int[1/((a + b\*x)\*(c + d\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n]),x]

[Out] Log[Log[e\*((a + b\*x)/(c + d\*x))^n]]/((b\*c - a\*d)\*n)

#### Rule 2504

```
Int[(u_)/Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_.))^p_.)*((c_.) + (d_.)*(x_.))^q_.]^r_.], x_Symbol] :> With[{h = Simplify[u*(a + b*x)*(c + d*x)]}, Simp
[(h*Log[Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]])/(p*r*(b*c - a*d)), x] /; FreeQ[h, x] /; FreeQ[{a, b, c, d, e, f, p, q, r}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0]
```

#### Rubi steps

$$\int \frac{1}{(a+bx)(c+dx) \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx = \frac{\log\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)n}$$



**Mathematica [A]** time = 0.069878, size = 34, normalized size = 1.03

$$\frac{\log\left(\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{n(ad-bc)}$$

Antiderivative was successfully verified.

[In] Integrate[1/((a + b\*x)\*(c + d\*x)\*Log[e\*((a + b\*x)/(c + d\*x))^n]),x]

[Out] -(Log[Log[e\*((a + b\*x)/(c + d\*x))^n]]/((-b\*c) + a\*d)\*n)

**Maple [F]** time = 0.815, size = 0, normalized size = 0.

$$\int \frac{1}{(bx+a)(dx+c)} \left( \ln \left( e \left( \frac{bx+a}{dx+c} \right)^n \right) \right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(b\*x+a)/(d\*x+c)/ln(e\*((b\*x+a)/(d\*x+c))^n),x)

[Out] int(1/(b\*x+a)/(d\*x+c)/ln(e\*((b\*x+a)/(d\*x+c))^n),x)

**Maxima [A]** time = 1.74459, size = 50, normalized size = 1.52

$$\frac{\log\left(-\log\left((bx+a)^n\right) + \log\left((dx+c)^n\right) - \log(e)\right)}{bcn - adn}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b\*x+a)/(d\*x+c)/log(e\*((b\*x+a)/(d\*x+c))^n),x, algorithm="maxima")

[Out] log(-log((b\*x + a)^n) + log((d\*x + c)^n) - log(e))/(b\*c\*n - a\*d\*n)

**Fricas [A]** time = 0.486093, size = 78, normalized size = 2.36

$$\frac{\log\left(n \log\left(\frac{bx+a}{dx+c}\right) + \log(e)\right)}{(bc-ad)n}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b\*x+a)/(d\*x+c)/log(e\*((b\*x+a)/(d\*x+c))^n),x, algorithm="fricas")

[Out] log(n\*log((b\*x + a)/(d\*x + c)) + log(e))/((b\*c - a\*d)\*n)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b\*x+a)/(d\*x+c)/ln(e\*((b\*x+a)/(d\*x+c))\*\*n),x)

[Out] Timed out

**Giac [A]** time = 1.17881, size = 43, normalized size = 1.3

$$\frac{\log\left(n \log\left(\frac{bx+a}{dx+c}\right) + 1\right)}{bcn - adn}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b\*x+a)/(d\*x+c)/log(e\*((b\*x+a)/(d\*x+c))^n),x, algorithm="giac")

[Out] log(n\*log((b\*x + a)/(d\*x + c)) + 1)/(b\*c\*n - a\*d\*n)

$$3.246 \quad \int \frac{1}{(a+bx)^2 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx$$

**Optimal.** Leaf size=71

$$\frac{(c+dx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}} \operatorname{Ei}\left(-\frac{\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(a+bx)(bc-ad)}$$

[Out] ((e\*((a + b\*x)/(c + d\*x))^n)^n^(-1)\*(c + d\*x)\*ExpIntegralEi[-(Log[e\*((a + b\*x)/(c + d\*x))^n]/n)])/((b\*c - a\*d)\*n\*(a + b\*x))

**Rubi [A]** time = 0.0289577, antiderivative size = 71, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 28,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.036$ , Rules used = {2493}

$$\frac{(c+dx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}} \operatorname{Ei}\left(-\frac{\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(a+bx)(bc-ad)}$$

Antiderivative was successfully verified.

[In] Int[1/((a + b\*x)^2\*Log[e\*((a + b\*x)/(c + d\*x))^n]),x]

[Out] ((e\*((a + b\*x)/(c + d\*x))^n)^n^(-1)\*(c + d\*x)\*ExpIntegralEi[-(Log[e\*((a + b\*x)/(c + d\*x))^n]/n)])/((b\*c - a\*d)\*n\*(a + b\*x))

### Rule 2493

Int[1/(Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^r\_.])\*((g\_.) + (h\_.)\*(x\_))^2, x\_Symbol] :> Simp[(b\*(c + d\*x)\*(e\*(f\*(a + b\*x)^p\*(c + d\*x)^q)^r)^(1/(p\*r))\*ExpIntegralEi[-(Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r)/(p\*r)]]/(h\*p\*r\*(b\*c - a\*d)\*(g + h\*x)), x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r}, x] && NeQ[b\*c - a\*d, 0] && EqQ[p + q, 0] && EqQ[b\*g - a\*h, 0]

### Rubi steps

$$\int \frac{1}{(a+bx)^2 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx = \frac{\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}} (c+dx) \operatorname{Ei}\left(-\frac{\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc-ad)n(a+bx)}$$

**Mathematica [A]** time = 0.0688921, size = 71, normalized size = 1.

$$\frac{(c+dx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}} \operatorname{Ei}\left(-\frac{\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(a+bx)(bc-ad)}$$

Antiderivative was successfully verified.

[In] Integrate[1/((a + b\*x)^2\*Log[e\*((a + b\*x)/(c + d\*x))^n]),x]

[Out] ((e\*((a + b\*x)/(c + d\*x))^n)^(-1)\*(c + d\*x)\*ExpIntegralEi[-(Log[e\*((a + b\*x)/(c + d\*x))^n]/n)])/((b\*c - a\*d)\*n\*(a + b\*x))

**Maple [F]** time = 0.44, size = 0, normalized size = 0.

$$\int \frac{1}{(bx+a)^2} \left( \ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) \right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(b\*x+a)^2/ln(e\*((b\*x+a)/(d\*x+c))^n),x)

[Out] int(1/(b\*x+a)^2/ln(e\*((b\*x+a)/(d\*x+c))^n),x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx+a)^2 \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b\*x+a)^2/log(e\*((b\*x+a)/(d\*x+c))^n),x, algorithm="maxima")

[Out] integrate(1/((b\*x + a)^2\*log(e\*((b\*x + a)/(d\*x + c))^n)), x)

**Fricas [A]** time = 0.487622, size = 93, normalized size = 1.31

$$\frac{e^{\left(\frac{1}{n}\right)} \log\_integral\left(\frac{dx+c}{(bx+a)e^{\left(\frac{1}{n}\right)}}\right)}{(bc-ad)n}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b\*x+a)^2/log(e\*((b\*x+a)/(d\*x+c))^n),x, algorithm="fricas")

[Out] e^(1/n)\*log\_integral((d\*x + c)/((b\*x + a)\*e^(1/n)))/((b\*c - a\*d)\*n)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(b\*x+a)\*\*2/ln(e\*((b\*x+a)/(d\*x+c))\*\*n),x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx+a)^2 \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*x+a)^2/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x + a)^2*log(e*((b*x + a)/(d*x + c))^n)), x)
```

$$3.247 \quad \int \frac{c+dx}{(a+bx)^3 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx$$

**Optimal.** Leaf size=75

$$\frac{(c+dx)^2 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{2/n} \operatorname{Ei}\left(-\frac{2 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(a+bx)^2(bc-ad)}$$

[Out] ((e\*((a + b\*x)/(c + d\*x))^n)^(2/n)\*(c + d\*x)^2\*ExpIntegralEi[(-2\*Log[e\*((a + b\*x)/(c + d\*x))^n])/n])/((b\*c - a\*d)\*n\*(a + b\*x)^2)

**Rubi [A]** time = 0.0472205, antiderivative size = 75, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 33,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.03$ , Rules used = {2510}

$$\frac{(c+dx)^2 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{2/n} \operatorname{Ei}\left(-\frac{2 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(a+bx)^2(bc-ad)}$$

Antiderivative was successfully verified.

[In] Int[(c + d\*x)/((a + b\*x)^3\*Log[e\*((a + b\*x)/(c + d\*x))^n]),x]

[Out] ((e\*((a + b\*x)/(c + d\*x))^n)^(2/n)\*(c + d\*x)^2\*ExpIntegralEi[(-2\*Log[e\*((a + b\*x)/(c + d\*x))^n])/n])/((b\*c - a\*d)\*n\*(a + b\*x)^2)

### Rule 2510

```
Int[(((a_.) + (b_.)*(x_.))^(m_.)*((c_.) + (d_.)*(x_.))^(n_.))/Log[(e_.)*((f_.)
)*((a_.) + (b_.)*(x_.))^(p_.)*((c_.) + (d_.)*(x_.))^(q_.))^(r_.)], x_Symbol]
:> Simp[((a + b*x)^(m + 1)*(c + d*x)^(n + 1)*ExpIntegralEi[((m + 1)*Log[e*(
f*(a + b*x)^p*(c + d*x)^q]^r)^(p*r)])/((p*r)*(b*c - a*d)*(e*(f*(a + b*x)^p*(
c + d*x)^q]^r)^(m + 1)/(p*r))], x] /; FreeQ[{a, b, c, d, e, f, m, n, p, q,
r}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ[m + n + 2, 0] && NeQ[m
, -1]
```

### Rubi steps

$$\int \frac{c + dx}{(a + bx)^3 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx = \frac{\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{2/n} (c + dx)^2 \operatorname{Ei}\left(-\frac{2 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc - ad)n(a + bx)^2}$$

**Mathematica [A]** time = 0.0165232, size = 75, normalized size = 1.

$$\frac{(c + dx)^2 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{2/n} \operatorname{Ei}\left(-\frac{2 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(a + bx)^2(bc - ad)}$$

Antiderivative was successfully verified.

[In] Integrate[(c + d\*x)/((a + b\*x)^3\*Log[e\*((a + b\*x)/(c + d\*x))^n]),x]

[Out] ((e\*((a + b\*x)/(c + d\*x))^n)^(2/n)\*(c + d\*x)^2\*ExpIntegralEi[(-2\*Log[e\*((a + b\*x)/(c + d\*x))^n])/n])/((b\*c - a\*d)\*n\*(a + b\*x)^2)

**Maple [F]** time = 0.439, size = 0, normalized size = 0.

$$\int \frac{dx + c}{(bx + a)^3} \left( \ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) \right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*x+c)/(b\*x+a)^3/ln(e\*((b\*x+a)/(d\*x+c))^n),x)

[Out] int((d\*x+c)/(b\*x+a)^3/ln(e\*((b\*x+a)/(d\*x+c))^n),x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{dx + c}{(bx + a)^3 \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)} dx$$



Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*x+c)/(b\*x+a)^3/log(e\*((b\*x+a)/(d\*x+c))^n),x, algorithm="maxima")

[Out] integrate((d\*x + c)/((b\*x + a)^3\*log(e\*((b\*x + a)/(d\*x + c))^n)), x)

**Fricas [A]** time = 0.511544, size = 136, normalized size = 1.81

$$\frac{e^{\frac{2}{n}} \log\_integral\left(\frac{d^2x^2+2cdx+c^2}{(b^2x^2+2abx+a^2)e^{\frac{2}{n}}}\right)}{(bc-ad)n}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*x+c)/(b\*x+a)^3/log(e\*((b\*x+a)/(d\*x+c))^n),x, algorithm="fricas")

[Out] e^(2/n)\*log\_integral((d^2\*x^2 + 2\*c\*d\*x + c^2)/((b^2\*x^2 + 2\*a\*b\*x + a^2)\*e^(2/n)))/((b\*c - a\*d)\*n)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*x+c)/(b\*x+a)\*\*3/ln(e\*((b\*x+a)/(d\*x+c))\*\*n),x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{dx + c}{(bx + a)^3 \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x+c)/(b*x+a)^3/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)/((b*x + a)^3*log(e*((b*x + a)/(d*x + c))^n)), x)
```

$$3.248 \quad \int \frac{(c+dx)^2}{(a+bx)^4 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx$$

**Optimal.** Leaf size=75

$$\frac{(c+dx)^3 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{3/n} \operatorname{Ei}\left(-\frac{3 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(a+bx)^3(bc-ad)}$$

[Out]  $((e*((a + b*x)/(c + d*x))^n)^{(3/n)}*(c + d*x)^3*\operatorname{ExpIntegralEi}[(-3*\operatorname{Log}[e*((a + b*x)/(c + d*x))^n])/n])/((b*c - a*d)*n*(a + b*x)^3)$

**Rubi [A]** time = 0.0698958, antiderivative size = 75, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 35,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.029$ , Rules used = {2510}

$$\frac{(c+dx)^3 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{3/n} \operatorname{Ei}\left(-\frac{3 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(a+bx)^3(bc-ad)}$$

Antiderivative was successfully verified.

[In]  $\operatorname{Int}[(c + d*x)^2/((a + b*x)^4*\operatorname{Log}[e*((a + b*x)/(c + d*x))^n]), x]$

[Out]  $((e*((a + b*x)/(c + d*x))^n)^{(3/n)}*(c + d*x)^3*\operatorname{ExpIntegralEi}[(-3*\operatorname{Log}[e*((a + b*x)/(c + d*x))^n])/n])/((b*c - a*d)*n*(a + b*x)^3)$

### Rule 2510

$\operatorname{Int}[(((a_.) + (b_.)*(x_.))^m)*((c_.) + (d_.)*(x_.))^n)/\operatorname{Log}[(e_.)*((f_.) * ((a_.) + (b_.)*(x_.))^p)*((c_.) + (d_.)*(x_.))^q]^r], x\_Symbol]$   
 $\rightarrow \operatorname{Simp}[(a + b*x)^{m+1}*(c + d*x)^{n+1}*\operatorname{ExpIntegralEi}[(m+1)*\operatorname{Log}[e*(f*(a + b*x)^p*(c + d*x)^q]^r)]/(p*r)]/(p*r*(b*c - a*d)*(e*(f*(a + b*x)^p*(c + d*x)^q)^r)^{(m+1)/(p*r)}, x] /;$   $\operatorname{FreeQ}\{a, b, c, d, e, f, m, n, p, q, r\}, x] \ \&\& \operatorname{NeQ}[b*c - a*d, 0] \ \&\& \operatorname{EqQ}[p + q, 0] \ \&\& \operatorname{EqQ}[m + n + 2, 0] \ \&\& \operatorname{NeQ}[m, -1]$

Rubi steps

$$\int \frac{(c+dx)^2}{(a+bx)^4 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)} dx = \frac{\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{3/n} (c+dx)^3 \operatorname{Ei}\left(-\frac{3 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{(bc-ad)n(a+bx)^3}$$

**Mathematica [A]** time = 0.0182585, size = 75, normalized size = 1.

$$\frac{(c+dx)^3 \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{3/n} \operatorname{Ei}\left(-\frac{3 \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{n}\right)}{n(a+bx)^3(bc-ad)}$$

Antiderivative was successfully verified.

[In] Integrate[(c + d\*x)^2/((a + b\*x)^4\*Log[e\*((a + b\*x)/(c + d\*x))^n]),x]

[Out] ((e\*((a + b\*x)/(c + d\*x))^n)^(3/n)\*(c + d\*x)^3\*ExpIntegralEi[(-3\*Log[e\*((a + b\*x)/(c + d\*x))^n])/n])/((b\*c - a\*d)\*n\*(a + b\*x)^3)

**Maple [F]** time = 0.67, size = 0, normalized size = 0.

$$\int \frac{(dx+c)^2}{(bx+a)^4} \left( \ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) \right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d\*x+c)^2/(b\*x+a)^4/ln(e\*((b\*x+a)/(d\*x+c))^n),x)

[Out] int((d\*x+c)^2/(b\*x+a)^4/ln(e\*((b\*x+a)/(d\*x+c))^n),x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx+c)^2}{(bx+a)^4 \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*x+c)^2/(b\*x+a)^4/log(e\*((b\*x+a)/(d\*x+c))^n),x, algorithm="maxima")

[Out] integrate((d\*x + c)^2/((b\*x + a)^4\*log(e\*((b\*x + a)/(d\*x + c))^n)), x)

**Fricas [A]** time = 0.520909, size = 180, normalized size = 2.4

$$\frac{e^{\frac{3}{n}} \log\_integral \left( \frac{d^3 x^3 + 3cd^2 x^2 + 3c^2 dx + c^3}{(b^3 x^3 + 3ab^2 x^2 + 3a^2 bx + a^3) e^{\frac{3}{n}}} \right)}{(bc - ad)n}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*x+c)^2/(b\*x+a)^4/log(e\*((b\*x+a)/(d\*x+c))^n),x, algorithm="fricas")

[Out] e^(3/n)\*log\_integral((d^3\*x^3 + 3\*c\*d^2\*x^2 + 3\*c^2\*d\*x + c^3)/((b^3\*x^3 + 3\*a\*b^2\*x^2 + 3\*a^2\*b\*x + a^3)\*e^(3/n)))/((b\*c - a\*d)\*n)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d\*x+c)\*\*2/(b\*x+a)\*\*4/ln(e\*((b\*x+a)/(d\*x+c))\*\*n),x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx + c)^2}{(bx + a)^4 \log \left( e \left( \frac{bx+a}{dx+c} \right)^n \right)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x+c)^2/(b*x+a)^4/log(e*((b*x+a)/(d*x+c))^n),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^2/((b*x + a)^4*log(e*((b*x + a)/(d*x + c))^n)), x)
```

$$3.249 \quad \int \frac{(A+B \log(e(a+bx)^n(c+dx)^{-n}))^4}{(f+gx)(ah+bhx)} dx$$

**Optimal.** Leaf size=361

$$\frac{24B^3n^3 \text{PolyLog}\left(4, \frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right) (B \log(e(a+bx)^n(c+dx)^{-n}) + A)}{h(bf-ag)} + \frac{12B^2n^2 \text{PolyLog}\left(3, \frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right) (B \log(e(a+bx)^n(c+dx)^{-n}) + A)}{h(bf-ag)}$$

```
[Out] -(((A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^4*Log[1 - ((b*f - a*g)*(c + d*x))]/((d*f - c*g)*(a + b*x))))/((b*f - a*g)*h) + (4*B*n*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3*PolyLog[2, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) + (12*B^2*n^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2*PolyLog[3, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) + (24*B^3*n^3*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])*PolyLog[4, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) + (24*B^4*n^4*PolyLog[5, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h)
```

**Rubi [B]** time = 1.92566, antiderivative size = 1021, normalized size of antiderivative = 2.83, number of steps used = 20, number of rules used = 9, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.209$ , Rules used = {6742, 36, 31, 2503, 2502, 2315, 2506, 6610, 2508}

$$\frac{\log(a+bx)A^4}{(bf-ag)h} - \frac{\log(f+gx)A^4}{(bf-ag)h} - \frac{4B \log(e(a+bx)^n(c+dx)^{-n}) \log\left(-\frac{(bc-ad)(f+gx)}{(df-cg)(a+bx)}\right) A^3}{(bf-ag)h} + \frac{4Bn \text{PolyLog}\left(2, \frac{(bc-ad)(f+gx)}{(df-cg)(a+bx)}\right)}{(bf-ag)h}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^4/((f + g*x)*(a*h + b*h*x)), x]
```

```
[Out] (A^4*Log[a + b*x])/((b*f - a*g)*h) - (A^4*Log[f + g*x])/((b*f - a*g)*h) - (4*A^3*B*Log[(e*(a + b*x)^n)/(c + d*x)^n]*Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))))]/((b*f - a*g)*h) - (6*A^2*B^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2*Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))))]/((b*f - a*g)*h) - (4*A*B^3*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3*Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))))]/((b*f - a*g)*h) - (B^4*Log[(e*(a + b*x)^n)/(c + d*x)^n]^4*Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))))]/((b*f - a*g)*h) + (4*A^3*B*n*PolyLog[2, 1 + ((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) + (12*A^2*B^2*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[2, 1 + ((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) + (12*A*B^3*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2*PolyLog[2, 1 + ((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) +
```

$$(4*B^4*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3*PolyLog[2, 1 + ((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) + (12*A^2*B^2*n^2*PolyLog[3, 1 + ((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) + (24*A*B^3*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[3, 1 + ((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) + (12*B^4*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2*PolyLog[3, 1 + ((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) + (24*A*B^3*n^3*PolyLog[4, 1 + ((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) + (24*B^4*n^3*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[4, 1 + ((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) + (24*B^4*n^4*PolyLog[5, 1 + ((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h)$$

### Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

### Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] := Dist[b/(b*c
- a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

### Rule 31

```
Int[((a_) + (b_.)*(x_))^(n_), x_Symbol] := Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

### Rule 2503

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(u_), x_Symbol] := With[{g = Coeff[Simplify[1/(u*(a + b*x))],
x, 0], h = Coeff[Simplify[1/(u*(a + b*x))], x, 1]}, -Simp[(Log[e*(f*(a + b
*x)^p*(c + d*x)^q]^r]^s*Log[-(((b*c - a*d)*(g + h*x))/((d*g - c*h)*(a + b*x
))))]/(b*g - a*h), x] + Dist[(p*r*s*(b*c - a*d))/(b*g - a*h), Int[(Log[e*(f
*(a + b*x)^p*(c + d*x)^q]^r]^(s - 1)*Log[-(((b*c - a*d)*(g + h*x))/((d*g -
c*h)*(a + b*x))))]/((a + b*x)*(c + d*x)), x], x] /; NeQ[b*g - a*h, 0] && Ne
Q[d*g - c*h, 0] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a
*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0] && LinearQ[Simplify[1/(u*(a + b*x))],
x]
```

### Rule 2502

```
Int[Log[((e_.)*((c_.) + (d_.)*(x_)))/((a_.) + (b_.)*(x_))]*(u_), x_Symbol]
:= With[{g = Coeff[Simplify[1/(u*(a + b*x))], x, 0], h = Coeff[Simplify[1/(
```



```
u*(a + b*x)], x, 1]}, -Dist[(b - d*e)/(h*(b*c - a*d)), Subst[Int[Log[e*x]/
(1 - e*x), x], x, (c + d*x)/(a + b*x)], x] /; EqQ[g*(b - d*e) - h*(a - c*e)
, 0]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b*c - a*d, 0] && LinearQ[Simplify
[1/(u*(a + b*x))], x]
```

### Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] := -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

### Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))
^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] := With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s - 1)]/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

### Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] := With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /; !FalseQ[w]] /; FreeQ[n, x]
```

### Rule 2508

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(u_)*PolyLog[n_, v_], x_Symbol] := With[{g = Simplify[(v*(c +
d*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, Simp[(h*PolyLog[n
+ 1, v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/(b*c - a*d), x] - Dist[h*p*
r*s, Int[(PolyLog[n + 1, v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s - 1)]/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e,
f, n, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

### Rubi steps

$$\begin{aligned}
\int \frac{(A + B \log(e(a + bx)^n(c + dx)^{-n}))^4}{(f + gx)(ah + bhx)} dx &= \int \left( \frac{A^4}{h(a + bx)(f + gx)} + \frac{4A^3B \log(e(a + bx)^n(c + dx)^{-n})}{h(a + bx)(f + gx)} + \frac{6A^2B^2 \log^2(e(a + bx)^n(c + dx)^{-n})}{h(a + bx)(f + gx)} \right) dx \\
&= \frac{A^4 \int \frac{1}{(a+bx)(f+gx)} dx}{h} + \frac{(4A^3B) \int \frac{\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)(f+gx)} dx}{h} + \frac{(6A^2B^2) \int \frac{\log^2(e(a+bx)^n(c+dx)^{-n})}{(a+bx)(f+gx)} dx}{h} \\
&= -\frac{4A^3B \log(e(a + bx)^n(c + dx)^{-n}) \log\left(-\frac{(bc-ad)(f+gx)}{(df-cg)(a+bx)}\right)}{(bf - ag)h} - \frac{6A^2B^2 \log^2(e(a + bx)^n(c + dx)^{-n})}{(bf - ag)h} \\
&= \frac{A^4 \log(a + bx)}{(bf - ag)h} - \frac{A^4 \log(f + gx)}{(bf - ag)h} - \frac{4A^3B \log(e(a + bx)^n(c + dx)^{-n}) \log\left(-\frac{(bc-ad)(f+gx)}{(df-cg)(a+bx)}\right)}{(bf - ag)h} \\
&= \frac{A^4 \log(a + bx)}{(bf - ag)h} - \frac{A^4 \log(f + gx)}{(bf - ag)h} - \frac{4A^3B \log(e(a + bx)^n(c + dx)^{-n}) \log\left(-\frac{(bc-ad)(f+gx)}{(df-cg)(a+bx)}\right)}{(bf - ag)h} \\
&= \frac{A^4 \log(a + bx)}{(bf - ag)h} - \frac{A^4 \log(f + gx)}{(bf - ag)h} - \frac{4A^3B \log(e(a + bx)^n(c + dx)^{-n}) \log\left(-\frac{(bc-ad)(f+gx)}{(df-cg)(a+bx)}\right)}{(bf - ag)h} \\
&= \frac{A^4 \log(a + bx)}{(bf - ag)h} - \frac{A^4 \log(f + gx)}{(bf - ag)h} - \frac{4A^3B \log(e(a + bx)^n(c + dx)^{-n}) \log\left(-\frac{(bc-ad)(f+gx)}{(df-cg)(a+bx)}\right)}{(bf - ag)h}
\end{aligned}$$

**Mathematica [F]** time = 4.20214, size = 0, normalized size = 0.

$$\int \frac{(A + B \log(e(a + bx)^n(c + dx)^{-n}))^4}{(f + gx)(ah + bhx)} dx$$

Verification is Not applicable to the result.

[In] Integrate[(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^4/((f + g\*x)\*(a\*h + b\*h\*x)), x]

[Out] Integrate[(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^4/((f + g\*x)\*(a\*h + b\*h\*x)), x]

**Maple [F]** time = 5.059, size = 0, normalized size = 0.

$$\int \frac{1}{(gx + f)(bhx + ah)} \left( A + B \ln \left( \frac{e(bx + a)^n}{(dx + c)^n} \right) \right)^4 dx$$



```
[Out] integral((B^4*log((b*x + a)^n*e/(d*x + c)^n)^4 + 4*A*B^3*log((b*x + a)^n*e/(d*x + c)^n)^3 + 6*A^2*B^2*log((b*x + a)^n*e/(d*x + c)^n)^2 + 4*A^3*B*log((b*x + a)^n*e/(d*x + c)^n) + A^4)/(b*g*h*x^2 + a*f*h + (b*f + a*g)*h*x), x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**4/(g*x+f)/(b*h*x+a*h), x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left( B \log\left( \frac{(bx+a)^n e}{(dx+c)^n} \right) + A \right)^4}{(bhx + ah)(gx + f)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^4/(g*x+f)/(b*h*x+a*h), x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^4/((b*h*x + a*h)*(g*x + f)), x)
```

$$3.250 \quad \int \frac{(A+B \log(e(a+bx)^n(c+dx)^{-n}))^3}{(f+gx)(ah+bhx)} dx$$

**Optimal.** Leaf size=282

$$\frac{6B^2n^2 \text{PolyLog}\left(3, \frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right) (B \log(e(a+bx)^n(c+dx)^{-n}) + A)}{h(bf-ag)} + \frac{3Bn \text{PolyLog}\left(2, \frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right) (B \log(e(a+bx)^n(c+dx)^{-n}) + A)}{h(bf-ag)}$$

```
[Out] -(((A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3*Log[1 - ((b*f - a*g)*(c + d*x))]/((d*f - c*g)*(a + b*x))))/((b*f - a*g)*h) + (3*B*n*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2*PolyLog[2, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) + (6*B^2*n^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])*PolyLog[3, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) + (6*B^3*n^3*PolyLog[4, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h)
```

**Rubi [B]** time = 1.21108, antiderivative size = 656, normalized size of antiderivative = 2.33, number of steps used = 15, number of rules used = 9, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.209$ , Rules used = {6742, 36, 31, 2503, 2502, 2315, 2506, 6610, 2508}

$$\frac{3A^2Bn \text{PolyLog}\left(2, \frac{(f+gx)(bc-ad)}{(a+bx)(df-cg)} + 1\right)}{h(bf-ag)} + \frac{6AB^2n \log(e(a+bx)^n(c+dx)^{-n}) \text{PolyLog}\left(2, \frac{(f+gx)(bc-ad)}{(a+bx)(df-cg)} + 1\right)}{h(bf-ag)} + \frac{6AB^2n^2 \text{PolyLog}\left(3, \frac{(f+gx)(bc-ad)}{(a+bx)(df-cg)} + 1\right)}{h(bf-ag)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/((f + g*x)*(a*h + b*h*x)), x]
```

```
[Out] (A^3*Log[a + b*x])/((b*f - a*g)*h) - (A^3*Log[f + g*x])/((b*f - a*g)*h) - (3*A^2*B*Log[(e*(a + b*x)^n)/(c + d*x)^n]*Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))))]/((b*f - a*g)*h) - (3*A*B^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2*Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))))]/((b*f - a*g)*h) - (B^3*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3*Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))))]/((b*f - a*g)*h) + (3*A^2*B*n*PolyLog[2, 1 + ((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) + (6*A*B^2*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[2, 1 + ((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) + (3*B^3*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2*PolyLog[2, 1 + ((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) + (6*A*B^2*n^2*PolyLog[3, 1 + ((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) + (6*B^3*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[3, 1 + ((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h) + (6*B^3*n^3*PolyLog[4, 1 + ((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x))])/((b*f - a*g)*h)
```

$(f - c*g)*(a + b*x))]/((b*f - a*g)*h)$

### Rule 6742

`Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]  
]`

### Rule 36

`Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] := Dist[b/(b*c  
- a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],  
x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]`

### Rule 31

`Int[((a_) + (b_.)*(x_))^-1, x_Symbol] := Simp[Log[RemoveContent[a + b*x,  
x]]/b, x] /; FreeQ[{a, b}, x]`

### Rule 2503

`Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))  
^(r_.)]^(s_.)*(u_), x_Symbol] := With[{g = Coeff[Simplify[1/(u*(a + b*x))],  
x, 0], h = Coeff[Simplify[1/(u*(a + b*x))], x, 1]}, -Simp[(Log[e*(f*(a + b  
*x)^p*(c + d*x)^q]^r]^s*Log[-(((b*c - a*d)*(g + h*x))/((d*g - c*h)*(a + b*x  
)))]/(b*g - a*h), x] + Dist[(p*r*s*(b*c - a*d))/(b*g - a*h), Int[(Log[e*(f  
*(a + b*x)^p*(c + d*x)^q]^r]^(s - 1)*Log[-(((b*c - a*d)*(g + h*x))/((d*g -  
c*h)*(a + b*x)))]/((a + b*x)*(c + d*x)), x], x] /; NeQ[b*g - a*h, 0] && Ne  
Q[d*g - c*h, 0] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a  
*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0] && LinearQ[Simplify[1/(u*(a + b*x))],  
x]`

### Rule 2502

`Int[Log[((e_.)*((c_.) + (d_.)*(x_)))/((a_.) + (b_.)*(x_))]*(u_), x_Symbol]  
:= With[{g = Coeff[Simplify[1/(u*(a + b*x))], x, 0], h = Coeff[Simplify[1/(  
u*(a + b*x))], x, 1]}, -Dist[(b - d*e)/(h*(b*c - a*d)), Subst[Int[Log[e*x]/  
(1 - e*x), x], x, (c + d*x)/(a + b*x)], x] /; EqQ[g*(b - d*e) - h*(a - c*e)  
, 0] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b*c - a*d, 0] && LinearQ[Simplify  
[1/(u*(a + b*x))], x]`

### Rule 2315

`Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] := -Simp[PolyLog[2, 1 -  
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]`

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] := With[{g = Simplify[((v - 1)*(c + d*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/(b*c - a*d), x] + Dist[h*p*r*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s - 1)/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] := With[{w = DerivativeDivides[v, u*v, x]}, Simp[w*PolyLog[n + 1, v], x] /; !FalseQ[w] /; FreeQ[n, x]
```

Rule 2508

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))^(r_.)]^(s_.)*(u_)*PolyLog[n_, v_], x_Symbol] := With[{g = Simplify[(v*(c + d*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, Simp[(h*PolyLog[n + 1, v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/(b*c - a*d), x] - Dist[h*p*r*s, Int[(PolyLog[n + 1, v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s - 1)/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f, n, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{(A + B \log(e(a + bx)^n(c + dx)^{-n}))^3}{(f + gx)(ah + bhx)} dx &= \int \left( \frac{A^3}{h(a + bx)(f + gx)} + \frac{3A^2B \log(e(a + bx)^n(c + dx)^{-n})}{h(a + bx)(f + gx)} + \frac{3AB^2 \log^2(e(a + bx)^n(c + dx)^{-n})}{h(a + bx)(f + gx)} \right) dx \\
&= \frac{A^3 \int \frac{1}{(a+bx)(f+gx)} dx}{h} + \frac{(3A^2B) \int \frac{\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)(f+gx)} dx}{h} + \frac{(3AB^2) \int \frac{\log^2(e(a+bx)^n(c+dx)^{-n})}{(a+bx)(f+gx)} dx}{h} \\
&= -\frac{3A^2B \log(e(a + bx)^n(c + dx)^{-n}) \log\left(-\frac{(bc-ad)(f+gx)}{(df-cg)(a+bx)}\right)}{(bf - ag)h} - \frac{3AB^2 \log^2(e(a + bx)^n(c + dx)^{-n})}{(bf - ag)h} \\
&= \frac{A^3 \log(a + bx)}{(bf - ag)h} - \frac{A^3 \log(f + gx)}{(bf - ag)h} - \frac{3A^2B \log(e(a + bx)^n(c + dx)^{-n}) \log\left(-\frac{(bc-ad)(f+gx)}{(df-cg)(a+bx)}\right)}{(bf - ag)h} \\
&= \frac{A^3 \log(a + bx)}{(bf - ag)h} - \frac{A^3 \log(f + gx)}{(bf - ag)h} - \frac{3A^2B \log(e(a + bx)^n(c + dx)^{-n}) \log\left(-\frac{(bc-ad)(f+gx)}{(df-cg)(a+bx)}\right)}{(bf - ag)h} \\
&= \frac{A^3 \log(a + bx)}{(bf - ag)h} - \frac{A^3 \log(f + gx)}{(bf - ag)h} - \frac{3A^2B \log(e(a + bx)^n(c + dx)^{-n}) \log\left(-\frac{(bc-ad)(f+gx)}{(df-cg)(a+bx)}\right)}{(bf - ag)h}
\end{aligned}$$

**Mathematica [F]** time = 3.09403, size = 0, normalized size = 0.

$$\int \frac{(A + B \log(e(a + bx)^n(c + dx)^{-n}))^3}{(f + gx)(ah + bhx)} dx$$

Verification is Not applicable to the result.

[In] Integrate[(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^3/((f + g\*x)\*(a\*h + b\*h\*x)), x]

[Out] Integrate[(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^3/((f + g\*x)\*(a\*h + b\*h\*x)), x]

**Maple [F]** time = 3.089, size = 0, normalized size = 0.

$$\int \frac{1}{(gx + f)(bhx + ah)} \left( A + B \ln \left( \frac{e(bx + a)^n}{(dx + c)^n} \right) \right)^3 dx$$

Verification of antiderivative is not currently implemented for this CAS.



[In] int((A+B\*ln(e\*(b\*x+a)^n/((d\*x+c)^n)))^3/(g\*x+f)/(b\*h\*x+a\*h), x)

[Out] int((A+B\*ln(e\*(b\*x+a)^n/((d\*x+c)^n)))^3/(g\*x+f)/(b\*h\*x+a\*h), x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$A^3 \left( \frac{\log(bx+a)}{(bf-ag)h} - \frac{\log(gx+f)}{(bf-ag)h} \right) - \int - \frac{B^3 \log((bx+a)^n)^3 - B^3 \log((dx+c)^n)^3 + B^3 \log(e)^3 + 3AB^2 \log(e)^2 + 3A^2B}{(bf-ag)h} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n)))^3/(g\*x+f)/(b\*h\*x+a\*h), x, algorithm="maxima")

[Out] A^3\*(log(b\*x + a)/((b\*f - a\*g)\*h) - log(g\*x + f)/((b\*f - a\*g)\*h)) - integrate(-(B^3\*log((b\*x + a)^n)^3 - B^3\*log((d\*x + c)^n)^3 + B^3\*log(e)^3 + 3\*A\*B^2\*log(e)^2 + 3\*A^2\*B\*log(e) + 3\*(B^3\*log(e) + A\*B^2)\*log((b\*x + a)^n)^2 + 3\*(B^3\*log((b\*x + a)^n) + B^3\*log(e) + A\*B^2)\*log((d\*x + c)^n)^2 + 3\*(B^3\*log(e)^2 + 2\*A\*B^2\*log(e) + A^2\*B)\*log((b\*x + a)^n) - 3\*(B^3\*log((b\*x + a)^n)^2 + B^3\*log(e)^2 + 2\*A\*B^2\*log(e) + A^2\*B + 2\*(B^3\*log(e) + A\*B^2)\*log((b\*x + a)^n))\*log((d\*x + c)^n)/(b\*g\*h\*x^2 + a\*f\*h + (b\*f\*h + a\*g\*h)\*x), x)

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{B^3 \log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^3 + 3AB^2 \log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2 + 3A^2B \log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A^3}{bg hx^2 + af h + (bf + ag)hx}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n)))^3/(g\*x+f)/(b\*h\*x+a\*h), x, algorithm="fricas")

[Out] integral((B^3\*log((b\*x + a)^n\*e/(d\*x + c)^n)^3 + 3\*A\*B^2\*log((b\*x + a)^n\*e/(d\*x + c)^n)^2 + 3\*A^2\*B\*log((b\*x + a)^n\*e/(d\*x + c)^n) + A^3)/(b\*g\*h\*x^2 + a\*f\*h + (b\*f + a\*g)\*h\*x), x)

---

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*(b\*x+a)\*\*n/((d\*x+c)\*\*n)))\*\*3/(g\*x+f)/(b\*h\*x+a\*h), x)

[Out] Timed out

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left( B \log\left( \frac{(bx+a)^n e}{(dx+c)^n} \right) + A \right)^3}{(bhx + ah)(gx + f)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n)))^3/(g\*x+f)/(b\*h\*x+a\*h), x, algorithm="giac")

[Out] integrate((B\*log((b\*x + a)^n\*e/(d\*x + c)^n) + A)^3/((b\*h\*x + a\*h)\*(g\*x + f)), x)

$$3.251 \quad \int \frac{(A+B \log(e(a+bx)^n(c+dx)^{-n}))^2}{(f+gx)(ah+bhx)} dx$$

**Optimal.** Leaf size=203

$$\frac{2Bn \text{PolyLog}\left(2, \frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right) (B \log(e(a+bx)^n(c+dx)^{-n}) + A)}{h(bf-ag)} + \frac{2B^2n^2 \text{PolyLog}\left(3, \frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right) \log\left(1 - \frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)}{h(bf-ag)}$$

[Out] -(((A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^2\*Log[1 - ((b\*f - a\*g)\*(c + d\*x))/((d\*f - c\*g)\*(a + b\*x))])/((b\*f - a\*g)\*h)) + (2\*B\*n\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])\*PolyLog[2, ((b\*f - a\*g)\*(c + d\*x))/((d\*f - c\*g)\*(a + b\*x))])/((b\*f - a\*g)\*h) + (2\*B^2\*n^2\*PolyLog[3, ((b\*f - a\*g)\*(c + d\*x))/((d\*f - c\*g)\*(a + b\*x))])/((b\*f - a\*g)\*h)

**Rubi [A]** time = 0.76188, antiderivative size = 371, normalized size of antiderivative = 1.83, number of steps used = 11, number of rules used = 8, integrand size = 43,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.186$ , Rules used = {6742, 36, 31, 2503, 2502, 2315, 2506, 6610}

$$\frac{2ABn \text{PolyLog}\left(2, \frac{(f+gx)(bc-ad)}{(a+bx)(df-cg)} + 1\right)}{h(bf-ag)} + \frac{2B^2n \log(e(a+bx)^n(c+dx)^{-n}) \text{PolyLog}\left(2, \frac{(f+gx)(bc-ad)}{(a+bx)(df-cg)} + 1\right)}{h(bf-ag)} + \frac{2B^2n^2 \text{PolyLog}\left(3, \frac{(f+gx)(bc-ad)}{(a+bx)(df-cg)} + 1\right) \log\left(1 - \frac{(f+gx)(bc-ad)}{(a+bx)(df-cg)}\right)}{h(bf-ag)}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^2/((f + g\*x)\*(a\*h + b\*h\*x)), x]

[Out] (A^2\*Log[a + b\*x])/((b\*f - a\*g)\*h) - (A^2\*Log[f + g\*x])/((b\*f - a\*g)\*h) - (2\*A\*B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]\*Log[-(((b\*c - a\*d)\*(f + g\*x))/((d\*f - c\*g)\*(a + b\*x)))]/((b\*f - a\*g)\*h) - (B^2\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]^2\*Log[-(((b\*c - a\*d)\*(f + g\*x))/((d\*f - c\*g)\*(a + b\*x)))]/((b\*f - a\*g)\*h) + (2\*A\*B\*n\*PolyLog[2, 1 + ((b\*c - a\*d)\*(f + g\*x))/((d\*f - c\*g)\*(a + b\*x))])/((b\*f - a\*g)\*h) + (2\*B^2\*n\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]\*PolyLog[2, 1 + ((b\*c - a\*d)\*(f + g\*x))/((d\*f - c\*g)\*(a + b\*x))])/((b\*f - a\*g)\*h) + (2\*B^2\*n^2\*PolyLog[3, 1 + ((b\*c - a\*d)\*(f + g\*x))/((d\*f - c\*g)\*(a + b\*x))])/((b\*f - a\*g)\*h)

**Rule 6742**

Int[u\_, x\_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] := Dist[b/(b*c
- a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^-1, x_Symbol] := Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2503

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(u_), x_Symbol] := With[{g = Coeff[Simplify[1/(u*(a + b*x))],
x, 0], h = Coeff[Simplify[1/(u*(a + b*x))], x, 1]}, -Simp[(Log[e*(f*(a + b
*x)^p*(c + d*x)^q]^r]^s*Log[-((b*c - a*d)*(g + h*x))/((d*g - c*h)*(a + b*x
)))]/(b*g - a*h), x] + Dist[(p*r*s*(b*c - a*d))/(b*g - a*h), Int[(Log[e*(f
*(a + b*x)^p*(c + d*x)^q]^r]^(s - 1)*Log[-((b*c - a*d)*(g + h*x))/((d*g -
c*h)*(a + b*x)))]/((a + b*x)*(c + d*x)), x], x] /; NeQ[b*g - a*h, 0] && Ne
Q[d*g - c*h, 0] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a
*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0] && LinearQ[Simplify[1/(u*(a + b*x))],
x]
```

Rule 2502

```
Int[Log[((e_.)*((c_.) + (d_.)*(x_)))/((a_.) + (b_.)*(x_))]*(u_), x_Symbol]
:= With[{g = Coeff[Simplify[1/(u*(a + b*x))], x, 0], h = Coeff[Simplify[1/(
u*(a + b*x))], x, 1]}, -Dist[(b - d*e)/(h*(b*c - a*d)), Subst[Int[Log[e*x]/
(1 - e*x), x], x, (c + d*x)/(a + b*x)], x] /; EqQ[g*(b - d*e) - h*(a - c*e)
, 0] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b*c - a*d, 0] && LinearQ[Simplify
[1/(u*(a + b*x))], x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] := -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))
^(q_.)]^(r_.)]^(s_.)*(u_), x_Symbol] := With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^(s - 1))/((
```

$a + b*x)*(c + d*x)), x], x] /; \text{FreeQ}\{g, h, x\} /; \text{FreeQ}\{a, b, c, d, e, f, p, q, r, s\}, x] \&\& \text{NeQ}[b*c - a*d, 0] \&\& \text{IGtQ}[s, 0] \&\& \text{EqQ}[p + q, 0]$

### Rule 6610

$\text{Int}[(u_)*\text{PolyLog}[n_, v_], x\_Symbol] \text{ :> With}\{w = \text{DerivativeDivides}[v, u*v, x]\}, \text{Simp}[w*\text{PolyLog}[n + 1, v], x] /; \text{!FalseQ}[w] /; \text{FreeQ}[n, x]$

### Rubi steps

$$\begin{aligned} \int \frac{(A + B \log(e(a + bx)^n(c + dx)^{-n}))^2}{(f + gx)(ah + bhx)} dx &= \int \left( \frac{A^2}{h(a + bx)(f + gx)} + \frac{2AB \log(e(a + bx)^n(c + dx)^{-n})}{h(a + bx)(f + gx)} + \frac{B^2 \log^2(e(a + bx)^n(c + dx)^{-n})}{h(a + bx)(f + gx)} \right) dx \\ &= \frac{A^2 \int \frac{1}{(a + bx)(f + gx)} dx}{h} + \frac{(2AB) \int \frac{\log(e(a + bx)^n(c + dx)^{-n})}{(a + bx)(f + gx)} dx}{h} + \frac{B^2 \int \frac{\log^2(e(a + bx)^n(c + dx)^{-n})}{(a + bx)(f + gx)} dx}{h} \\ &= -\frac{2AB \log(e(a + bx)^n(c + dx)^{-n}) \log\left(-\frac{(bc - ad)(f + gx)}{(df - cg)(a + bx)}\right)}{(bf - ag)h} - \frac{B^2 \log^2(e(a + bx)^n(c + dx)^{-n}) \log\left(-\frac{(bc - ad)(f + gx)}{(df - cg)(a + bx)}\right)}{(bf - ag)h} \\ &= \frac{A^2 \log(a + bx)}{(bf - ag)h} - \frac{A^2 \log(f + gx)}{(bf - ag)h} - \frac{2AB \log(e(a + bx)^n(c + dx)^{-n}) \log\left(-\frac{(bc - ad)(f + gx)}{(df - cg)(a + bx)}\right)}{(bf - ag)h} \\ &= \frac{A^2 \log(a + bx)}{(bf - ag)h} - \frac{A^2 \log(f + gx)}{(bf - ag)h} - \frac{2AB \log(e(a + bx)^n(c + dx)^{-n}) \log\left(-\frac{(bc - ad)(f + gx)}{(df - cg)(a + bx)}\right)}{(bf - ag)h} \end{aligned}$$

**Mathematica [B]** time = 1.04567, size = 1415, normalized size = 6.97

result too large to display

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^2/((f + g\*x)\*(a\*h + b\*h\*x)), x]

[Out] (3\*Log[a + b\*x]\*(A + B\*(-(n\*Log[a + b\*x]) + n\*Log[c + d\*x] + Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]))^2 - 3\*(A + B\*(-(n\*Log[a + b\*x]) + n\*Log[c + d\*x] + Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]))^2\*Log[f + g\*x] + 3\*B\*n\*(A + B\*(-(n\*Log[a + b\*x]) + n\*Log[c + d\*x] + Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]))\*(Log[a + b\*x]^2 - 2\*(Log[a + b\*x]\*Log[(b\*(f + g\*x))/(b\*f - a\*g]) + PolyLog[2, (g\*(a + b\*x))/(-b\*f + a\*g)])) - 6\*A\*B\*n\*(Log[c + d\*x]\*(Log[(d\*(a + b\*x))/(-b\*c + a\*g)]))

d)] - Log[(d\*(f + g\*x))/(d\*f - c\*g)] + PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)] - PolyLog[2, (g\*(c + d\*x))/(-(d\*f) + c\*g)] + 6\*B^2\*n\*(n\*Log[a + b\*x] - n\*Log[c + d\*x] - Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])\*(Log[c + d\*x]\*(Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)] - Log[(d\*(f + g\*x))/(d\*f - c\*g)])) + PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)] - PolyLog[2, (g\*(c + d\*x))/(-(d\*f) + c\*g)] + B^2\*n^2\*(Log[a + b\*x]^2\*(Log[a + b\*x] - 3\*Log[(b\*(f + g\*x))/(b\*f - a\*g)]) - 6\*Log[a + b\*x]\*PolyLog[2, (g\*(a + b\*x))/(-(b\*f) + a\*g)] + 6\*PolyLog[3, (g\*(a + b\*x))/(-(b\*f) + a\*g)]) + 3\*B^2\*n^2\*(Log[(d\*(a + b\*x))/(-(b\*c) + a\*d)]\*Log[c + d\*x]^2 - Log[c + d\*x]^2\*Log[(d\*(f + g\*x))/(d\*f - c\*g)] + 2\*Log[c + d\*x]\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)] - 2\*Log[c + d\*x]\*PolyLog[2, (g\*(c + d\*x))/(-(d\*f) + c\*g)] - 2\*PolyLog[3, (b\*(c + d\*x))/(b\*c - a\*d)] + 2\*PolyLog[3, (g\*(c + d\*x))/(-(d\*f) + c\*g)]) - 6\*B^2\*n^2\*((Log[a + b\*x]^2\*(Log[c + d\*x] - Log[(b\*(c + d\*x))/(b\*c - a\*d)]))/2 - Log[a + b\*x]\*Log[c + d\*x]\*Log[(b\*(f + g\*x))/(b\*f - a\*g)] - (Log[(g\*(c + d\*x))/(-(d\*f) + c\*g)]\*(-2\*Log[a + b\*x] + Log[(g\*(c + d\*x))/(-(d\*f) + c\*g)]\*(Log[(b\*(f + g\*x))/(b\*f - a\*g)] - Log[(d\*(f + g\*x))/(d\*f - c\*g)]))/2 + Log[(g\*(c + d\*x))/(-(d\*f) + c\*g)]\*Log[((b\*f - a\*g)\*(c + d\*x))/((d\*f - c\*g)\*(a + b\*x))]\*(Log[(b\*(f + g\*x))/(b\*f - a\*g)] - Log[(d\*(f + g\*x))/(d\*f - c\*g)] - (Log[((b\*f - a\*g)\*(c + d\*x))/((d\*f - c\*g)\*(a + b\*x))]^2\*(Log[(-(b\*c) + a\*d)/(d\*(a + b\*x))] + Log[(b\*(f + g\*x))/(b\*f - a\*g)] - Log[((-b\*c) + a\*d)\*(f + g\*x))/((d\*f - c\*g)\*(a + b\*x)))/2 - Log[a + b\*x]\*PolyLog[2, (d\*(a + b\*x))/(-(b\*c) + a\*d)] - (Log[c + d\*x] - Log[((b\*f - a\*g)\*(c + d\*x))/((d\*f - c\*g)\*(a + b\*x))])\*PolyLog[2, (g\*(a + b\*x))/(-(b\*f) + a\*g)] - (Log[a + b\*x] + Log[((b\*f - a\*g)\*(c + d\*x))/((d\*f - c\*g)\*(a + b\*x))])\*PolyLog[2, (g\*(c + d\*x))/(-(d\*f) + c\*g)] - Log[((b\*f - a\*g)\*(c + d\*x))/((d\*f - c\*g)\*(a + b\*x))]\*(PolyLog[2, (b\*(c + d\*x))/(d\*(a + b\*x))]) - PolyLog[2, ((b\*f - a\*g)\*(c + d\*x))/((d\*f - c\*g)\*(a + b\*x))]) + PolyLog[3, (d\*(a + b\*x))/(-(b\*c) + a\*d)] + PolyLog[3, (g\*(a + b\*x))/(-(b\*f) + a\*g)] + PolyLog[3, (g\*(c + d\*x))/(-(d\*f) + c\*g)] + PolyLog[3, (b\*(c + d\*x))/(d\*(a + b\*x))] - PolyLog[3, ((b\*f - a\*g)\*(c + d\*x))/((d\*f - c\*g)\*(a + b\*x))])/(3\*(b\*f - a\*g)\*h)

**Maple [F]** time = 3.411, size = 0, normalized size = 0.

$$\int \frac{1}{(gx + f)(bhx + ah)} \left( A + B \ln \left( \frac{e(bx + a)^n}{(dx + c)^n} \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*(b\*x+a)^n/((d\*x+c)^n)))^2/(g\*x+f)/(b\*h\*x+a\*h), x)

[Out] int((A+B\*ln(e\*(b\*x+a)^n/((d\*x+c)^n)))^2/(g\*x+f)/(b\*h\*x+a\*h), x)

---

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$A^2 \left( \frac{\log(bx+a)}{(bf-ag)h} - \frac{\log(gx+f)}{(bf-ag)h} \right) + \int \frac{B^2 \log((bx+a)^n)^2 + B^2 \log((dx+c)^n)^2 + B^2 \log(e)^2 + 2AB \log(e) + 2(B^2 \log((bx+a)^n) - B^2 \log((dx+c)^n)) \log(e)}{bghx^2 + afh} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n)))^2/(g\*x+f)/(b\*h\*x+a\*h),x, algorithm="maxima")

[Out] A^2\*(log(b\*x + a)/((b\*f - a\*g)\*h) - log(g\*x + f)/((b\*f - a\*g)\*h)) + integrate((B^2\*log((b\*x + a)^n)^2 + B^2\*log((d\*x + c)^n)^2 + B^2\*log(e)^2 + 2\*A\*B\*log(e) + 2\*(B^2\*log(e) + A\*B)\*log((b\*x + a)^n) - 2\*(B^2\*log((b\*x + a)^n) + B^2\*log(e) + A\*B)\*log((d\*x + c)^n))/(b\*g\*h\*x^2 + a\*f\*h + (b\*f\*h + a\*g\*h)\*x), x)

---

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{B^2 \log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2 + 2AB \log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A^2}{bghx^2 + afh + (bf + ag)hx}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n)))^2/(g\*x+f)/(b\*h\*x+a\*h),x, algorithm="fricas")

[Out] integral((B^2\*log((b\*x + a)^n\*e/(d\*x + c)^n)^2 + 2\*A\*B\*log((b\*x + a)^n\*e/(d\*x + c)^n) + A^2)/(b\*g\*h\*x^2 + a\*f\*h + (b\*f + a\*g)\*h\*x), x)

---

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*ln(e\*(b\*x+a)\*\*n/((d\*x+c)\*\*n)))\*\*2/(g\*x+f)/(b\*h\*x+a\*h),x)

[Out] Timed out

---

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left( B \log\left( \frac{(bx+a)^n e}{(dx+c)^n} \right) + A \right)^2}{(bhx + ah)(gx + f)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n)))^2/(g\*x+f)/(b\*h\*x+a\*h),x, algorithm="giac")

[Out] integrate((B\*log((b\*x + a)^n\*e/(d\*x + c)^n) + A)^2/((b\*h\*x + a\*h)\*(g\*x + f)), x)



$$3.252 \quad \int \frac{A+B \log(e(a+bx)^n(c+dx)^{-n})}{(f+gx)(ah+bhx)} dx$$

**Optimal.** Leaf size=123

$$\frac{Bn \text{PolyLog}\left(2, \frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)}{h(bf-ag)} - \frac{\log\left(1 - \frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right) (B \log(e(a+bx)^n(c+dx)^{-n}) + A)}{h(bf-ag)}$$

[Out] -(((A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])\*Log[1 - ((b\*f - a\*g)\*(c + d\*x))/((d\*f - c\*g)\*(a + b\*x))])/((b\*f - a\*g)\*h)) + (B\*n\*PolyLog[2, ((b\*f - a\*g)\*(c + d\*x))/((d\*f - c\*g)\*(a + b\*x))])/((b\*f - a\*g)\*h)

**Rubi [A]** time = 0.365071, antiderivative size = 163, normalized size of antiderivative = 1.33, number of steps used = 8, number of rules used = 6, integrand size = 41,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.146$ , Rules used = {6742, 36, 31, 2503, 2502, 2315}

$$\frac{Bn \text{PolyLog}\left(2, \frac{(f+gx)(bc-ad)}{(a+bx)(df-cg)} + 1\right)}{h(bf-ag)} + \frac{A \log(a+bx)}{h(bf-ag)} - \frac{A \log(f+gx)}{h(bf-ag)} - \frac{B \log(e(a+bx)^n(c+dx)^{-n}) \log\left(-\frac{(f+gx)(bc-ad)}{(a+bx)(df-cg)}\right)}{h(bf-ag)}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])/((f + g\*x)\*(a\*h + b\*h\*x)), x]

[Out] (A\*Log[a + b\*x])/((b\*f - a\*g)\*h) - (A\*Log[f + g\*x])/((b\*f - a\*g)\*h) - (B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]\*Log[-(((b\*c - a\*d)\*(f + g\*x))/((d\*f - c\*g)\*(a + b\*x)))]/((b\*f - a\*g)\*h) + (B\*n\*PolyLog[2, 1 + ((b\*c - a\*d)\*(f + g\*x))/((d\*f - c\*g)\*(a + b\*x))])/((b\*f - a\*g)\*h)

### Rule 6742

Int[u\_, x\_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]

### Rule 36

Int[1/(((a\_.) + (b\_.)\*(x\_))\*((c\_.) + (d\_.)\*(x\_))), x\_Symbol] := Dist[b/(b\*c - a\*d), Int[1/(a + b\*x), x], x] - Dist[d/(b\*c - a\*d), Int[1/(c + d\*x), x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b\*c - a\*d, 0]

### Rule 31

```
Int[((a_) + (b_.)*(x_))^-1), x_Symbol] := Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

### Rule 2503

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(u_), x_Symbol] := With[{g = Coeff[Simplify[1/(u*(a + b*x))],
x, 0], h = Coeff[Simplify[1/(u*(a + b*x))], x, 1]}, -Simp[(Log[e*(f*(a + b
*x)^p*(c + d*x)^q]^r]^s*Log[-((b*c - a*d)*(g + h*x))/((d*g - c*h)*(a + b*x
)))]/(b*g - a*h), x] + Dist[(p*r*s*(b*c - a*d))/(b*g - a*h), Int[(Log[e*(f
*(a + b*x)^p*(c + d*x)^q]^r]^(s - 1)*Log[-((b*c - a*d)*(g + h*x))/((d*g -
c*h)*(a + b*x)))]/((a + b*x)*(c + d*x)), x], x] /; NeQ[b*g - a*h, 0] && Ne
Q[d*g - c*h, 0] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a
*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0] && LinearQ[Simplify[1/(u*(a + b*x))],
x]
```

### Rule 2502

```
Int[Log[((e_.)*((c_.) + (d_.)*(x_)))/((a_.) + (b_.)*(x_))]*(u_), x_Symbol]
:= With[{g = Coeff[Simplify[1/(u*(a + b*x))], x, 0], h = Coeff[Simplify[1/(
u*(a + b*x))], x, 1]}, -Dist[(b - d*e)/(h*(b*c - a*d)), Subst[Int[Log[e*x]/
(1 - e*x), x], x, (c + d*x)/(a + b*x)], x] /; EqQ[g*(b - d*e) - h*(a - c*e
, 0] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b*c - a*d, 0] && LinearQ[Simplify
[1/(u*(a + b*x))], x]
```

### Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] := -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

### Rubi steps

$$\begin{aligned}
\int \frac{A + B \log(e(a + bx)^n(c + dx)^{-n})}{(f + gx)(ah + bhx)} dx &= \int \left( \frac{A}{h(a + bx)(f + gx)} + \frac{B \log(e(a + bx)^n(c + dx)^{-n})}{h(a + bx)(f + gx)} \right) dx \\
&= \frac{A \int \frac{1}{(a+bx)(f+gx)} dx}{h} + \frac{B \int \frac{\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)(f+gx)} dx}{h} \\
&= -\frac{B \log(e(a + bx)^n(c + dx)^{-n}) \log\left(-\frac{(bc-ad)(f+gx)}{(df-cg)(a+bx)}\right)}{(bf - ag)h} + \frac{(Ab) \int \frac{1}{a+bx} dx}{(bf - ag)h} - \frac{(Ag) \int \frac{1}{f+gx} dx}{(bf - ag)h} \\
&= \frac{A \log(a + bx)}{(bf - ag)h} - \frac{A \log(f + gx)}{(bf - ag)h} - \frac{B \log(e(a + bx)^n(c + dx)^{-n}) \log\left(-\frac{(bc-ad)(f+gx)}{(df-cg)(a+bx)}\right)}{(bf - ag)h} \\
&= \frac{A \log(a + bx)}{(bf - ag)h} - \frac{A \log(f + gx)}{(bf - ag)h} - \frac{B \log(e(a + bx)^n(c + dx)^{-n}) \log\left(-\frac{(bc-ad)(f+gx)}{(df-cg)(a+bx)}\right)}{(bf - ag)h}
\end{aligned}$$

**Mathematica [B]** time = 0.291616, size = 304, normalized size = 2.47

$$2Bn\text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right) + 2Bn\text{PolyLog}\left(2, \frac{g(a+bx)}{ag-bf}\right) - 2Bn\text{PolyLog}\left(2, \frac{g(c+dx)}{cg-df}\right) - 2A \log(a + bx) + 2B \log(f + gx)$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])/((f + g\*x)\*(a\*h + b\*h\*x)), x]

[Out] -(-2\*A\*Log[a + b\*x] + B\*n\*Log[a + b\*x]^2 - 2\*B\*n\*Log[a + b\*x]\*Log[c + d\*x] + 2\*B\*n\*Log[(d\*(a + b\*x))/(-b\*c) + a\*d])\*Log[c + d\*x] - 2\*B\*Log[a + b\*x]\*Log[Log[(e\*(a + b\*x)^n)/(c + d\*x)^n] + 2\*A\*Log[f + g\*x] - 2\*B\*n\*Log[a + b\*x]\*Log[f + g\*x] + 2\*B\*n\*Log[c + d\*x]\*Log[f + g\*x] + 2\*B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]\*Log[f + g\*x] + 2\*B\*n\*Log[a + b\*x]\*Log[(b\*(f + g\*x))/(b\*f - a\*g)] - 2\*B\*n\*Log[c + d\*x]\*Log[(d\*(f + g\*x))/(d\*f - c\*g)] + 2\*B\*n\*PolyLog[2, (g\*(a + b\*x))/(-b\*f) + a\*g] + 2\*B\*n\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)] - 2\*B\*n\*PolyLog[2, (g\*(c + d\*x))/(-d\*f) + c\*g]]/(2\*(b\*f - a\*g)\*h)

**Maple [C]** time = 0.73, size = 1447, normalized size = 11.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(g*x+f)/(b*h*x+a*h),x)`

[Out] 
$$-1/2*I/h/(a*g-b*f)*\ln(g*x+f)*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-1/2*I/h/(a*g-b*f)*\ln(g*x+f)*B*Pi*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+1/2*I/h/(a*g-b*f)*\ln(b*x+a)*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+B/h*n/(a*g-b*f)*\operatorname{dilog}((d*(g*x+f)+c*g-d*f)/(c*g-d*f))-B/h*n/(a*g-b*f)*\operatorname{dilog}((-a*d+b*c+d*(b*x+a))/(-a*d+b*c))+1/h/(a*g-b*f)*\ln(g*x+f)*B*\ln(e)-1/h/(a*g-b*f)*\ln(b*x+a)*B*\ln(e)+1/2*I/h/(a*g-b*f)*\ln(b*x+a)*B*Pi*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))+1/2*I/h/(a*g-b*f)*\ln(b*x+a)*B*Pi*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+1/h*B/(a*g-b*f)*\ln(g*x+f)*\ln((b*x+a)^n)-1/h*B*n/(a*g-b*f)*\ln(g*x+f)*\ln((b*(g*x+f)+a*g-b*f)/(a*g-b*f))+B/h*n/(a*g-b*f)*\ln(g*x+f)*\ln((d*(g*x+f)+c*g-d*f)/(c*g-d*f))-B/h*n/(a*g-b*f)*\ln(b*x+a)*\ln((-a*d+b*c+d*(b*x+a))/(-a*d+b*c))-1/2*I/h/(a*g-b*f)*\ln(g*x+f)*B*Pi*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-1/h*B*\ln((b*x+a)^n)/(a*g-b*f)*\ln(b*x+a)-B/h*\ln((d*x+c)^n)/(a*g-b*f)*\ln(g*x+f)+B/h*\ln((d*x+c)^n)/(a*g-b*f)*\ln(b*x+a)-1/2*I/h/(a*g-b*f)*\ln(g*x+f)*B*Pi*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-1/h*A/(a*g-b*f)*\ln(b*x+a)+1/h*A/(a*g-b*f)*\ln(g*x+f)-1/h*B*n/(a*g-b*f)*\operatorname{dilog}((b*(g*x+f)+a*g-b*f)/(a*g-b*f))+1/2/h*B*n/(a*g-b*f)*\ln(b*x+a)^2-1/2*I/h/(a*g-b*f)*\ln(b*x+a)*B*Pi*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I/h/(a*g-b*f)*\ln(g*x+f)*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-1/2*I/h/(a*g-b*f)*\ln(b*x+a)*B*Pi*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-1/2*I/h/(a*g-b*f)*\ln(b*x+a)*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I/h/(a*g-b*f)*\ln(g*x+f)*B*Pi*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I/h/(a*g-b*f)*\ln(g*x+f)*B*Pi*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-1/2*I/h/(a*g-b*f)*\ln(b*x+a)*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I/h/(a*g-b*f)*\ln(b*x+a)*B*Pi*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3$$

---

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$A \left( \frac{\log(bx+a)}{(bf-ag)h} - \frac{\log(gx+f)}{(bf-ag)h} \right) - B \int -\frac{\log((bx+a)^n) - \log((dx+c)^n) + \log(e)}{bghx^2 + afh + (bfh + agh)x} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(g*x+f)/(b*h*x+a*h),x, algorithm="maxima")`

[Out]  $A \cdot (\log(bx + a) / ((bf - ag)h) - \log(gx + f) / ((bf - ag)h)) - B \cdot \text{integrate}(-(\log((bx + a)^n) - \log((dx + c)^n) + \log(e)) / (bghx^2 + afh + (bf + ag)hx), x)$

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{B \log \left( \frac{(bx+a)^n e}{(dx+c)^n} \right) + A}{bghx^2 + afh + (bf + ag)hx}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(g*x+f)/(b*h*x+a*h),x, algorithm="fricas")`

[Out] `integral((B*log((b*x + a)^n*e/(d*x + c)^n) + A)/(b*g*h*x^2 + a*f*h + (b*f + a*g)*h*x), x)`

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))/(g*x+f)/(b*h*x+a*h),x)`

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{B \log \left( \frac{(bx+a)^n e}{(dx+c)^n} \right) + A}{(bhx + ah)(gx + f)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(g*x+f)/(b*h*x+a*h),x, algorithm="giac")`

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)/((b*h*x + a*h)*(g*x + f)),  
x)
```

$$3.253 \quad \int \frac{1}{(f+gx)(ah+bhx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))} dx$$

**Optimal.** Leaf size=81

$$\text{Subst} \left( \text{Unintegrable} \left( \frac{1}{(f+gx)(ah+bhx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}, x \right), e \left( \frac{a+bx}{c+dx} \right)^n, e(a+bx)^n(c+dx)^{-n} \right)$$

[Out] Defer[Subst][Unintegrable[1/((f + g\*x)\*(a\*h + b\*h\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])), x], e\*((a + b\*x)/(c + d\*x))^n, (e\*(a + b\*x)^n)/(c + d\*x)^n]

**Rubi [A]** time = 0.426943, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.$ , Rules used = {}

$$\int \frac{1}{(f+gx)(ah+bhx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))} dx$$

Verification is Not applicable to the result.

[In] Int[1/((f + g\*x)\*(a\*h + b\*h\*x)\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])), x]

[Out] (b\*Defer[Int][1/((a + b\*x)\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])), x])/((b\*f - a\*g)\*h) - (g\*Defer[Int][1/((f + g\*x)\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])), x])/((b\*f - a\*g)\*h)

Rubi steps

$$\begin{aligned} \int \frac{1}{(f+gx)(ah+bhx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))} dx &= \int \left( \frac{b}{(bf-ag)h(a+bx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))} \right. \\ &= \frac{b \int \frac{1}{(a+bx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))} dx}{(bf-ag)h} - \frac{g \int \frac{1}{(f+gx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))} dx}{(bf-ag)h} \end{aligned}$$

**Mathematica [A]** time = 0.16094, size = 0, normalized size = 0.

$$\int \frac{1}{(f+gx)(ah+bhx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))} dx$$

Verification is Not applicable to the result.

[In] Integrate[1/((f + g\*x)\*(a\*h + b\*h\*x)\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])), x]

[Out] Integrate[1/((f + g\*x)\*(a\*h + b\*h\*x)\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])), x]

**Maple [A]** time = 7.096, size = 0, normalized size = 0.

$$\int \frac{1}{(gx + f)(bhx + ah)} \left( A + B \ln \left( \frac{e(bx + a)^n}{(dx + c)^n} \right) \right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(g\*x+f)/(b\*h\*x+a\*h)/(A+B\*ln(e\*(b\*x+a)^n/((d\*x+c)^n))), x)

[Out] int(1/(g\*x+f)/(b\*h\*x+a\*h)/(A+B\*ln(e\*(b\*x+a)^n/((d\*x+c)^n))), x)

**Maxima [A]** time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bhx + ah)(gx + f) \left( B \log \left( \frac{(bx+a)^n e}{(dx+c)^n} \right) + A \right)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(g\*x+f)/(b\*h\*x+a\*h)/(A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n))), x, algorithm="maxima")

[Out] integrate(1/((b\*h\*x + a\*h)\*(g\*x + f)\*(B\*log((b\*x + a)^n\*e/(d\*x + c)^n) + A)), x)

**Fricas [A]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{1}{Abghx^2 + Aafh + (Abf + Aag)hx + (Bbghx^2 + Bafh + (Bbf + Bag)hx) \log \left( \frac{(bx+a)^n e}{(dx+c)^n} \right)}, x \right)$$



Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(b*h*x+a*h)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="fricas")
```

```
[Out] integral(1/(A*b*g*h*x^2 + A*a*f*h + (A*b*f + A*a*g)*h*x + (B*b*g*h*x^2 + B*a*f*h + (B*b*f + B*a*g)*h*x)*log((b*x + a)^n*e/(d*x + c)^n)), x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(b*h*x+a*h)/(A+B*ln(e*(b*x+a)**n/((d*x+c)**n))),x)
```

```
[Out] Timed out
```

**Giac [A]** time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bhx + ah)(gx + f)\left(B \log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A\right)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(b*h*x+a*h)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="giac")
```

```
[Out] integrate(1/((b*h*x + a*h)*(g*x + f)*(B*log((b*x + a)^n*e/(d*x + c)^n) + A)), x)
```

$$3.254 \quad \int \frac{1}{(f+gx)(ah+bhx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))^2} dx$$

**Optimal.** Leaf size=81

$$\text{Subst} \left( \text{Unintegrable} \left( \frac{1}{(f+gx)(ah+bhx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)^2}, x \right), e \left( \frac{a+bx}{c+dx} \right)^n, e(a+bx)^n(c+dx)^{-n} \right)$$

[Out] Defer[Subst][Unintegrable[1/((f + g\*x)\*(a\*h + b\*h\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2), x], e\*((a + b\*x)/(c + d\*x))^n, (e\*(a + b\*x)^n)/(c + d\*x)^n]

**Rubi [A]** time = 0.479691, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.$ , Rules used = {}

$$\int \frac{1}{(f+gx)(ah+bhx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))^2} dx$$

Verification is Not applicable to the result.

[In] Int[1/((f + g\*x)\*(a\*h + b\*h\*x)\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^2), x]

[Out] (b\*Defer[Int][1/((a + b\*x)\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^2), x]) / ((b\*f - a\*g)\*h) - (g\*Defer[Int][1/((f + g\*x)\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^2), x]) / ((b\*f - a\*g)\*h)

Rubi steps

$$\begin{aligned} \int \frac{1}{(f+gx)(ah+bhx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))^2} dx &= \int \left( \frac{b}{(bf-ag)h(a+bx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))} \right. \\ &= \frac{b \int \frac{1}{(a+bx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))^2} dx}{(bf-ag)h} - \frac{g \int \frac{1}{(f+gx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))^2} dx}{(bf-ag)h} \end{aligned}$$

**Mathematica [A]** time = 0.331617, size = 0, normalized size = 0.

$$\int \frac{1}{(f + gx)(ah + bhx) (A + B \log(e(a + bx)^n(c + dx)^{-n}))^2} dx$$

Verification is Not applicable to the result.

[In] Integrate[1/((f + g\*x)\*(a\*h + b\*h\*x)\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^2), x]

[Out] Integrate[1/((f + g\*x)\*(a\*h + b\*h\*x)\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^2), x]

**Maple [A]** time = 9.293, size = 0, normalized size = 0.

$$\int \frac{1}{(gx + f)(bhx + ah) \left( A + B \ln \left( \frac{e(bx + a)^n}{(dx + c)^n} \right) \right)^{-2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(g\*x+f)/(b\*h\*x+a\*h)/(A+B\*ln(e\*(b\*x+a)^n/((d\*x+c)^n)))^2,x)

[Out] int(1/(g\*x+f)/(b\*h\*x+a\*h)/(A+B\*ln(e\*(b\*x+a)^n/((d\*x+c)^n)))^2,x)

**Maxima [A]** time = 0., size = 0, normalized size = 0.

$$(df - cg) \int \frac{1}{(bcf^2hn - adf^2hn)AB + (bcf^2hn \log(e) - adf^2hn \log(e))B^2 + ((bcg^2hn - adg^2hn)AB + (bcg^2hn \log(e) - adg^2hn \log(e))B^2)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(g\*x+f)/(b\*h\*x+a\*h)/(A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n)))^2,x, algorithm="maxima")

[Out] (d\*f - c\*g)\*integrate(1/((b\*c\*f^2\*h\*n - a\*d\*f^2\*h\*n)\*A\*B + (b\*c\*f^2\*h\*n\*log(e) - a\*d\*f^2\*h\*n\*log(e))\*B^2 + ((b\*c\*g^2\*h\*n - a\*d\*g^2\*h\*n)\*A\*B + (b\*c\*g^2\*h\*n\*log(e) - a\*d\*g^2\*h\*n\*log(e))\*B^2)\*x^2 + 2\*((b\*c\*f\*g\*h\*n - a\*d\*f\*g\*h\*n)\*A\*B + (b\*c\*f\*g\*h\*n\*log(e) - a\*d\*f\*g\*h\*n\*log(e))\*B^2)\*x + ((b\*c\*g^2\*h\*n - a

```

*d*g^2*h*n)*B^2*x^2 + 2*(b*c*f*g*h*n - a*d*f*g*h*n)*B^2*x + (b*c*f^2*h*n -
a*d*f^2*h*n)*B^2)*log((b*x + a)^n) - ((b*c*g^2*h*n - a*d*g^2*h*n)*B^2*x^2 +
2*(b*c*f*g*h*n - a*d*f*g*h*n)*B^2*x + (b*c*f^2*h*n - a*d*f^2*h*n)*B^2)*log
((d*x + c)^n)), x) - (d*x + c)/((b*c*f*h*n - a*d*f*h*n)*A*B + (b*c*f*h*n*log
(e) - a*d*f*h*n*log(e))*B^2 + ((b*c*g*h*n - a*d*g*h*n)*A*B + (b*c*g*h*n*log
(e) - a*d*g*h*n*log(e))*B^2)*x + ((b*c*g*h*n - a*d*g*h*n)*B^2*x + (b*c*f*h
*n - a*d*f*h*n)*B^2)*log((b*x + a)^n) - ((b*c*g*h*n - a*d*g*h*n)*B^2*x + (b
*c*f*h*n - a*d*f*h*n)*B^2)*log((d*x + c)^n))

```

**Fricas [A]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{1}{A^2 b g h x^2 + A^2 a f h + (A^2 b f + A^2 a g) h x + (B^2 b g h x^2 + B^2 a f h + (B^2 b f + B^2 a g) h x) \log \left( \frac{(b x + a)^n e}{(d x + c)^n} \right)^2 + 2 (A B b g h x^2 + A B a f h + (A B b f + A B a g) h x) \log \left( \frac{(b x + a)^n e}{(d x + c)^n} \right)}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```

[In] integrate(1/(g*x+f)/(b*h*x+a*h)/(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, alg
orithm="fricas")

```

```

[Out] integral(1/(A^2*b*g*h*x^2 + A^2*a*f*h + (A^2*b*f + A^2*a*g)*h*x + (B^2*b*g*
h*x^2 + B^2*a*f*h + (B^2*b*f + B^2*a*g)*h*x)*log((b*x + a)^n*e/(d*x + c)^n)
^2 + 2*(A*B*b*g*h*x^2 + A*B*a*f*h + (A*B*b*f + A*B*a*g)*h*x)*log((b*x + a)^
n*e/(d*x + c)^n)), x)

```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```

[In] integrate(1/(g*x+f)/(b*h*x+a*h)/(A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2,x)

```

```

[Out] Timed out

```

**Giac [A]** time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bhx + ah)(gx + f)\left(B \log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A\right)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(g\*x+f)/(b\*h\*x+a\*h)/(A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n)))^2,x, algorithm="giac")

[Out] integrate(1/((b\*h\*x + a\*h)\*(g\*x + f)\*(B\*log((b\*x + a)^n\*e/(d\*x + c)^n) + A)^2), x)

$$3.255 \quad \int \frac{\log\left(\frac{c+dx}{a+bx}\right)}{(a+bx)((a-c)h+(b-d)hx)} dx$$

**Optimal.** Leaf size=33

$$\frac{\text{PolyLog}\left(2, 1 - \frac{c+dx}{a+bx}\right)}{h(bc - ad)}$$

[Out] -(PolyLog[2, 1 - (c + d\*x)/(a + b\*x)]/((b\*c - a\*d)\*h))

**Rubi [A]** time = 0.0950319, antiderivative size = 33, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 40,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.05$ , Rules used = {2502, 2315}

$$\frac{\text{PolyLog}\left(2, 1 - \frac{c+dx}{a+bx}\right)}{h(bc - ad)}$$

Antiderivative was successfully verified.

[In] Int[Log[(c + d\*x)/(a + b\*x)]/((a + b\*x)\*((a - c)\*h + (b - d)\*h\*x)),x]

[Out] -(PolyLog[2, 1 - (c + d\*x)/(a + b\*x)]/((b\*c - a\*d)\*h))

#### Rule 2502

```
Int[Log[((e_.)*((c_.) + (d_.)*(x_)))/((a_.) + (b_.)*(x_))]*(u_), x_Symbol]
:> With[{g = Coeff[Simplify[1/(u*(a + b*x))], x, 0], h = Coeff[Simplify[1/(
u*(a + b*x))], x, 1]}, -Dist[(b - d*e)/(h*(b*c - a*d)), Subst[Int[Log[e*x]/
(1 - e*x), x], x, (c + d*x)/(a + b*x)], x] /; EqQ[g*(b - d*e) - h*(a - c*e)
, 0]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b*c - a*d, 0] && LinearQ[Simplify
[1/(u*(a + b*x))], x]
```

#### Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

#### Rubi steps

$$\int \frac{\log\left(\frac{c+dx}{a+bx}\right)}{(a+bx)((a-c)h+(b-d)hx)} dx = -\frac{\text{Subst}\left(\int \frac{\log(x)}{1-x} dx, x, \frac{c+dx}{a+bx}\right)}{(bc-ad)h}$$

$$= -\frac{\text{Li}_2\left(1 - \frac{c+dx}{a+bx}\right)}{(bc-ad)h}$$

**Mathematica [B]** time = 0.173132, size = 298, normalized size = 9.03

$$2\text{PolyLog}\left(2, \frac{d(a+bx)}{ad-bc}\right) + 2\text{PolyLog}\left(2, -\frac{b(a+bx-c-dx)}{bc-ad}\right) - 2\text{PolyLog}\left(2, -\frac{d(-a-bx+c+dx)}{ad-bc}\right) - \log^2\left(\frac{ad-bc}{d(a+bx)}\right) - 2\log\left(\frac{b(c+dx)}{bc-ad}\right)$$

Antiderivative was successfully verified.

[In] Integrate[Log[(c + d\*x)/(a + b\*x)]/((a + b\*x)\*((a - c)\*h + (b - d)\*h\*x)), x]

[Out] (-Log[(-b\*c) + a\*d]/(d\*(a + b\*x)))^2 + 2\*Log[((b - d)\*(a + b\*x))/(b\*c - a\*d)]\*Log[a - c + b\*x - d\*x] - 2\*Log[(-b\*c) + a\*d]/(d\*(a + b\*x))\*Log[(b\*(c + d\*x))/(b\*c - a\*d)] - 2\*Log[a - c + b\*x - d\*x]\*Log[((b - d)\*(c + d\*x))/(b\*c - a\*d)] + 2\*Log[(-b\*c) + a\*d]/(d\*(a + b\*x))\*Log[(c + d\*x)/(a + b\*x)] + 2\*Log[a - c + b\*x - d\*x]\*Log[(c + d\*x)/(a + b\*x)] + 2\*PolyLog[2, (d\*(a + b\*x))/(-b\*c) + a\*d] + 2\*PolyLog[2, -((b\*(a - c + b\*x - d\*x))/(b\*c - a\*d))] - 2\*PolyLog[2, -((d\*(-a + c - b\*x + d\*x))/(-b\*c) + a\*d)]/((2\*b\*c - 2\*a\*d)\*h)

**Maple [A]** time = 0.065, size = 42, normalized size = 1.3

$$\frac{1}{h(ad-bc)} \text{dilog}\left(-\frac{ad-bc}{b(bx+a)} + \frac{d}{b}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(ln((d\*x+c)/(b\*x+a))/(b\*x+a)/((a-c)\*h+(b-d)\*h\*x), x)

[Out] 1/h/(a\*d-b\*c)\*dilog(-1/b\*(a\*d-b\*c)/(b\*x+a)+d/b)

**Maxima [B]** time = 1.27618, size = 482, normalized size = 14.61

$$\left( \frac{\log(-(b-d)x - a + c)}{(bc-ad)h} - \frac{\log(bx+a)}{(bc-ad)h} \right) \log\left(\frac{dx+c}{bx+a}\right) + \frac{2 \log(-(b-d)x - a + c) \log(bx+a) - \log(bx+a)^2}{2(bch-adh)} + \frac{\log(bx+a)}{h}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(log((d\*x+c)/(b\*x+a))/(b\*x+a)/((a-c)\*h+(b-d)\*h\*x),x, algorithm="maxima")

[Out] (log(-(b-d)\*x - a + c)/((b\*c - a\*d)\*h) - log(b\*x + a)/((b\*c - a\*d)\*h))\*log((d\*x + c)/(b\*x + a)) + 1/2\*(2\*log(-(b-d)\*x - a + c)\*log(b\*x + a) - log(b\*x + a)^2)/(b\*c\*h - a\*d\*h) + (log(b\*x + a)\*log((b\*d\*x + a\*d)/(b\*c - a\*d) + 1) + dilog(-(b\*d\*x + a\*d)/(b\*c - a\*d)))/(b\*c\*h - a\*d\*h) - (log(b\*x + a)\*log(-(a\*(b-d) + (b^2 - b\*d)\*x)/(b\*c - a\*d) + 1) + dilog((a\*(b-d) + (b^2 - b\*d)\*x)/(b\*c - a\*d)))/(b\*c\*h - a\*d\*h) - (log(-(b-d)\*x - a + c)\*log((a\*d - c\*d + (b\*d - d^2)\*x)/(b\*c - a\*d) + 1) + dilog(-(a\*d - c\*d + (b\*d - d^2)\*x)/(b\*c - a\*d)))/(b\*c\*h - a\*d\*h)

**Fricas [A]** time = 0.461014, size = 68, normalized size = 2.06

$$-\frac{\text{Li}_2\left(-\frac{dx+c}{bx+a} + 1\right)}{(bc-ad)h}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(log((d\*x+c)/(b\*x+a))/(b\*x+a)/((a-c)\*h+(b-d)\*h\*x),x, algorithm="fricas")

[Out] -dilog(-(d\*x + c)/(b\*x + a) + 1)/((b\*c - a\*d)\*h)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(ln((d\*x+c)/(b\*x+a))/(b\*x+a)/((a-c)\*h+(b-d)\*h\*x),x)



[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\log\left(\frac{dx+c}{bx+a}\right)}{((b-d)hx + (a-c)h)(bx+a)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(log((d\*x+c)/(b\*x+a))/(b\*x+a)/((a-c)\*h+(b-d)\*h\*x),x, algorithm="giac")

[Out] integrate(log((d\*x + c)/(b\*x + a))/(((b - d)\*h\*x + (a - c)\*h)\*(b\*x + a)), x)

$$3.256 \quad \int \frac{\log\left(\frac{a-cg+(b-dg)x}{a+bx}\right)}{(a+bx)(c+dx)} dx$$

**Optimal.** Leaf size=27

$$\frac{\text{PolyLog}\left(2, \frac{g(c+dx)}{a+bx}\right)}{bc - ad}$$

[Out] PolyLog[2, (g\*(c + d\*x))/(a + b\*x)]/(b\*c - a\*d)

**Rubi [A]** time = 0.0656417, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 38,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.053$ , Rules used = {2502, 2315}

$$\frac{\text{PolyLog}\left(2, \frac{g(c+dx)}{a+bx}\right)}{bc - ad}$$

Antiderivative was successfully verified.

[In] Int[Log[(a - c\*g + (b - d\*g)\*x)/(a + b\*x)]/((a + b\*x)\*(c + d\*x)),x]

[Out] PolyLog[2, (g\*(c + d\*x))/(a + b\*x)]/(b\*c - a\*d)

### Rule 2502

```
Int[Log[((e_.)*((c_.) + (d_.)*(x_)))/((a_.) + (b_.)*(x_))]*(u_), x_Symbol]
:> With[{g = Coeff[Simplify[1/(u*(a + b*x))], x, 0], h = Coeff[Simplify[1/(
u*(a + b*x))], x, 1]}, -Dist[(b - d*e)/(h*(b*c - a*d)), Subst[Int[Log[e*x]/
(1 - e*x), x], x, (c + d*x)/(a + b*x)], x] /; EqQ[g*(b - d*e) - h*(a - c*e)
, 0] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b*c - a*d, 0] && LinearQ[Simplify
[1/(u*(a + b*x))], x]
```

### Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

### Rubi steps

$$\int \frac{\log\left(\frac{a-cg+(b-dg)x}{a+bx}\right)}{(a+bx)(c+dx)} dx = -\frac{g \operatorname{Subst}\left(\int \frac{\log(x)}{1-x} dx, x, \frac{a-cg+(b-dg)x}{a+bx}\right)}{b(a-cg) - a(b-dg)}$$

$$= \frac{\operatorname{Li}_2\left(\frac{g(c+dx)}{a+bx}\right)}{bc-ad}$$

**Mathematica [B]** time = 0.241122, size = 320, normalized size = 11.85

$$-2\operatorname{PolyLog}\left(2, \frac{(a+bx)(b-dg)}{g(bc-ad)}\right) + 2\operatorname{PolyLog}\left(2, \frac{(b-dg)(c+dx)}{bc-ad}\right) - 2\operatorname{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right) + \log^2\left(\frac{g(bc-ad)}{(a+bx)(b-dg)}\right) + 2\log\left(-\frac{b(a+bx-c)}{g(bc-ad)}\right)$$

Antiderivative was successfully verified.

[In] Integrate[Log[(a - c\*g + (b - d\*g)\*x)/(a + b\*x)]/((a + b\*x)\*(c + d\*x)), x]

[Out] (Log[((b\*c - a\*d)\*g)/((b - d\*g)\*(a + b\*x))]^2 - 2\*Log[(d\*(a + b\*x))/(-(b\*c + a\*d))]\*Log[c + d\*x] + 2\*Log[c + d\*x]\*Log[-((d\*(a - c\*g + b\*x - d\*g\*x))/(b\*c - a\*d))] + 2\*Log[((b\*c - a\*d)\*g)/((b - d\*g)\*(a + b\*x))]\*Log[-((b\*(a - c\*g + b\*x - d\*g\*x))/((b\*c - a\*d)\*g))] - 2\*Log[((b\*c - a\*d)\*g)/((b - d\*g)\*(a + b\*x))]\*Log[(a - c\*g + b\*x - d\*g\*x)/(a + b\*x)] - 2\*Log[c + d\*x]\*Log[(a - c\*g + b\*x - d\*g\*x)/(a + b\*x)] - 2\*PolyLog[2, ((b - d\*g)\*(a + b\*x))/((b\*c - a\*d)\*g)] - 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)] + 2\*PolyLog[2, ((b - d\*g)\*(c + d\*x))/(b\*c - a\*d)]/(2\*b\*c - 2\*a\*d)

**Maple [A]** time = 0.065, size = 45, normalized size = 1.7

$$-\frac{1}{ad-bc} \operatorname{dilog}\left(\frac{-dg+b}{b} + \frac{g(ad-bc)}{b(bx+a)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(ln((a-c\*g+(-d\*g+b)\*x)/(b\*x+a))/(b\*x+a)/(d\*x+c), x)

[Out] -1/(a\*d-b\*c)\*dilog((-d\*g+b)/b+g\*(a\*d-b\*c)/b/(b\*x+a))

**Maxima [B]** time = 1.41181, size = 464, normalized size = 17.19

$$\left(\frac{\log(bx+a)}{bc-ad} - \frac{\log(dx+c)}{bc-ad}\right) \log\left(-\frac{cg+(dg-b)x-a}{bx+a}\right) + \frac{\log(bx+a)^2 - 2\log(bx+a)\log(dx+c)}{2(bc-ad)} - \frac{\log(bx+a)\log\left(\frac{cg+(dg-b)x-a}{bx+a}\right)}{bc-ad}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(log((a-c\*g+(-d\*g+b)\*x)/(b\*x+a))/(b\*x+a)/(d\*x+c),x, algorithm="maxima")

[Out] (log(b\*x + a)/(b\*c - a\*d) - log(d\*x + c)/(b\*c - a\*d))\*log(-(c\*g + (d\*g - b)\*x - a)/(b\*x + a)) + 1/2\*(log(b\*x + a)^2 - 2\*log(b\*x + a)\*log(d\*x + c))/(b\*c - a\*d) - (log(b\*x + a)\*log(((d\*g - b)\*a + (b\*d\*g - b^2)\*x)/(b\*c\*g - a\*d\*g) + 1) + dilog(-((d\*g - b)\*a + (b\*d\*g - b^2)\*x)/(b\*c\*g - a\*d\*g)))/(b\*c - a\*d) + (log(d\*x + c)\*log((c\*d\*g - b\*c + (d^2\*g - b\*d)\*x)/(b\*c - a\*d) + 1) + dilog(-(c\*d\*g - b\*c + (d^2\*g - b\*d)\*x)/(b\*c - a\*d)))/(b\*c - a\*d) + (log(b\*x + a)\*log((b\*d\*x + a\*d)/(b\*c - a\*d) + 1) + dilog(-(b\*d\*x + a\*d)/(b\*c - a\*d)))/(b\*c - a\*d)

**Fricas [A]** time = 0.476334, size = 78, normalized size = 2.89

$$\frac{\text{Li}_2\left(\frac{cg+(dg-b)x-a}{bx+a} + 1\right)}{bc-ad}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(log((a-c\*g+(-d\*g+b)\*x)/(b\*x+a))/(b\*x+a)/(d\*x+c),x, algorithm="fricas")

[Out] dilog((c\*g + (d\*g - b)\*x - a)/(b\*x + a) + 1)/(b\*c - a\*d)

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln((a-c*g+(-d*g+b)*x)/(b*x+a))/(b*x+a)/(d*x+c),x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\log\left(-\frac{cg+(dg-b)x-a}{bx+a}\right)}{(bx+a)(dx+c)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log((a-c*g+(-d*g+b)*x)/(b*x+a))/(b*x+a)/(d*x+c),x, algorithm="gias")
```

```
[Out] integrate(log(-(c*g + (d*g - b)*x - a)/(b*x + a))/((b*x + a)*(d*x + c)), x)
```

$$3.257 \quad \int \frac{\log\left(1 - \frac{g(c+dx)}{a+bx}\right)}{(a+bx)(c+dx)} dx$$

**Optimal.** Leaf size=27

$$\frac{\text{PolyLog}\left(2, \frac{g(c+dx)}{a+bx}\right)}{bc - ad}$$

[Out] PolyLog[2, (g\*(c + d\*x))/(a + b\*x)]/(b\*c - a\*d)

**Rubi [A]** time = 0.117526, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 33,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$ , Rules used = {2517, 2502, 2315}

$$\frac{\text{PolyLog}\left(2, \frac{g(c+dx)}{a+bx}\right)}{bc - ad}$$

Antiderivative was successfully verified.

[In] Int[Log[1 - (g\*(c + d\*x))/(a + b\*x)]/((a + b\*x)\*(c + d\*x)), x]

[Out] PolyLog[2, (g\*(c + d\*x))/(a + b\*x)]/(b\*c - a\*d)

#### Rule 2517

```
Int[Log[(e_.)*((f_.)*((g_) + (v_.)/(w_.)))^(r_.)]^(s_.)*(u_.), x_Symbol] :>
Int[u*Log[e*((f*ExpandToSum[v + g*w, x])/ExpandToSum[w, x])^r]^s, x] /; FreeQ[{e, f, g, r, s}, x] && LinearQ[w, x] && (FreeQ[v, x] || LinearQ[v, x]) && AlgebraicFunctionQ[u, x]
```

#### Rule 2502

```
Int[Log[((e_.)*((c_.) + (d_.)*(x_)))/((a_.) + (b_.)*(x_))]*(u_), x_Symbol]
:> With[{g = Coeff[Simplify[1/(u*(a + b*x))], x, 0], h = Coeff[Simplify[1/(u*(a + b*x))], x, 1]}, -Dist[(b - d*e)/(h*(b*c - a*d)), Subst[Int[Log[e*x]/(1 - e*x), x], x, (c + d*x)/(a + b*x)], x] /; EqQ[g*(b - d*e) - h*(a - c*e), 0] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b*c - a*d, 0] && LinearQ[Simplify[1/(u*(a + b*x))], x]
```

#### Rule 2315

Int[Log[(c\_.)\*(x\_)]/((d\_) + (e\_.)\*(x\_)), x\_Symbol] := -Simp[PolyLog[2, 1 - c\*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c\*d, 0]

### Rubi steps

$$\begin{aligned} \int \frac{\log\left(1 - \frac{g(c+dx)}{a+bx}\right)}{(a+bx)(c+dx)} dx &= \int \frac{\log\left(\frac{a-cg+(b-dg)x}{a+bx}\right)}{(a+bx)(c+dx)} dx \\ &= -\frac{g \operatorname{Subst}\left(\int \frac{\log(x)}{1-x} dx, x, \frac{a-cg+(b-dg)x}{a+bx}\right)}{b(a-cg) - a(b-dg)} \\ &= \frac{\operatorname{Li}_2\left(\frac{g(c+dx)}{a+bx}\right)}{bc - ad} \end{aligned}$$

**Mathematica [B]** time = 0.17915, size = 320, normalized size = 11.85

$$-2\operatorname{PolyLog}\left(2, \frac{(a+bx)(b-dg)}{g(bc-ad)}\right) + 2\operatorname{PolyLog}\left(2, \frac{(b-dg)(c+dx)}{bc-ad}\right) - 2\operatorname{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right) + \log^2\left(\frac{g(bc-ad)}{(a+bx)(b-dg)}\right) + 2\log\left(-\frac{b(a+bx-c)}{g(bc-ad)}\right)$$

Antiderivative was successfully verified.

[In] Integrate[Log[1 - (g\*(c + d\*x))/(a + b\*x)]/((a + b\*x)\*(c + d\*x)), x]

[Out] (Log[((b\*c - a\*d)\*g)/((b - d\*g)\*(a + b\*x))]^2 - 2\*Log[(d\*(a + b\*x))/(-(b\*c + a\*d))]\*Log[c + d\*x] + 2\*Log[c + d\*x]\*Log[-((d\*(a - c\*g + b\*x - d\*g\*x))/(b\*c - a\*d))] + 2\*Log[((b\*c - a\*d)\*g)/((b - d\*g)\*(a + b\*x))]\*Log[-((b\*(a - c\*g + b\*x - d\*g\*x))/(b\*c - a\*d)\*g)] - 2\*Log[((b\*c - a\*d)\*g)/((b - d\*g)\*(a + b\*x))]\*Log[(a - c\*g + b\*x - d\*g\*x)/(a + b\*x)] - 2\*Log[c + d\*x]\*Log[(a - c\*g + b\*x - d\*g\*x)/(a + b\*x)] - 2\*PolyLog[2, ((b - d\*g)\*(a + b\*x))/((b\*c - a\*d)\*g)] - 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)] + 2\*PolyLog[2, ((b - d\*g)\*(c + d\*x))/(b\*c - a\*d)]/(2\*b\*c - 2\*a\*d)

**Maple [A]** time = 0.063, size = 45, normalized size = 1.7

$$-\frac{1}{ad - bc} \operatorname{dilog}\left(\frac{-dg + b}{b} + \frac{g(ad - bc)}{b(bx + a)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int(ln(1-g*(d*x+c)/(b*x+a))/(b*x+a)/(d*x+c),x)`

[Out] `-1/(a*d-b*c)*dilog((-d*g+b)/b+g*(a*d-b*c)/b/(b*x+a))`

**Maxima [B]** time = 1.31414, size = 454, normalized size = 16.81

$$\left(\frac{\log(bx+a)}{bc-ad} - \frac{\log(dx+c)}{bc-ad}\right) \log\left(-\frac{(dx+c)g}{bx+a} + 1\right) + \frac{\log(bx+a)^2 - 2\log(bx+a)\log(dx+c)}{2(bc-ad)} - \frac{\log(bx+a)\log\left(\frac{(dg-b)}{b}\right)}{bc-ad}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(log(1-g*(d*x+c)/(b*x+a))/(b*x+a)/(d*x+c),x, algorithm="maxima")`

[Out] `(log(b*x + a)/(b*c - a*d) - log(d*x + c)/(b*c - a*d))*log(-(d*x + c)*g/(b*x + a) + 1) + 1/2*(log(b*x + a)^2 - 2*log(b*x + a)*log(d*x + c))/(b*c - a*d) - (log(b*x + a)*log(((d*g - b)*a + (b*d*g - b^2)*x)/(b*c*g - a*d*g) + 1) + dilog(-((d*g - b)*a + (b*d*g - b^2)*x)/(b*c*g - a*d*g)))/(b*c - a*d) + (log(d*x + c)*log((c*d*g - b*c + (d^2*g - b*d)*x)/(b*c - a*d) + 1) + dilog(-(c*d*g - b*c + (d^2*g - b*d)*x)/(b*c - a*d)))/(b*c - a*d) + (log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))/(b*c - a*d)`

**Fricas [A]** time = 0.497173, size = 78, normalized size = 2.89

$$\frac{\text{Li}_2\left(\frac{cg+(dg-b)x-a}{bx+a} + 1\right)}{bc-ad}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(log(1-g*(d*x+c)/(b*x+a))/(b*x+a)/(d*x+c),x, algorithm="fricas")`

[Out] `dilog((c*g + (d*g - b)*x - a)/(b*x + a) + 1)/(b*c - a*d)`

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out



Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(ln(1-g\*(d\*x+c)/(b\*x+a))/(b\*x+a)/(d\*x+c),x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\log\left(-\frac{(dx+c)g}{bx+a} + 1\right)}{(bx+a)(dx+c)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(log(1-g\*(d\*x+c)/(b\*x+a))/(b\*x+a)/(d\*x+c),x, algorithm="giac")

[Out] integrate(log(-(d\*x + c)\*g/(b\*x + a) + 1)/((b\*x + a)\*(d\*x + c)), x)

$$3.258 \quad \int \frac{\log\left(\frac{a-cg+bx-dgx}{a+bx}\right)}{(a+bx)(c+dx)} dx$$

**Optimal.** Leaf size=27

$$\frac{\text{PolyLog}\left(2, \frac{g(c+dx)}{a+bx}\right)}{bc - ad}$$

[Out] PolyLog[2, (g\*(c + d\*x))/(a + b\*x)]/(b\*c - a\*d)

**Rubi [A]** time = 0.116849, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 38,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.079$ , Rules used = {2516, 2502, 2315}

$$\frac{\text{PolyLog}\left(2, \frac{g(c+dx)}{a+bx}\right)}{bc - ad}$$

Antiderivative was successfully verified.

[In] Int[Log[(a - c\*g + b\*x - d\*g\*x)/(a + b\*x)]/((a + b\*x)\*(c + d\*x)), x]

[Out] PolyLog[2, (g\*(c + d\*x))/(a + b\*x)]/(b\*c - a\*d)

#### Rule 2516

```
Int[Log[(e_.)*((f_.)*(v_)^(p_.)*(w_)^(q_.))^(r_.)]^(s_.)*(u_.), x_Symbol] :
> Int[u*Log[e*(f*ExpandToSum[v, x]^p*ExpandToSum[w, x]^q)^r]^s, x] /; FreeQ
[{e, f, p, q, r, s}, x] && LinearQ[{v, w}, x] && !LinearMatchQ[{v, w}, x]
&& AlgebraicFunctionQ[u, x]
```

#### Rule 2502

```
Int[Log[((e_.)*((c_.) + (d_.)*(x_)))/((a_.) + (b_.)*(x_))]*(u_), x_Symbol]
:> With[{g = Coeff[Simplify[1/(u*(a + b*x))], x, 0], h = Coeff[Simplify[1/
u*(a + b*x)], x, 1]}, -Dist[(b - d*e)/(h*(b*c - a*d)), Subst[Int[Log[e*x]/
(1 - e*x), x], x, (c + d*x)/(a + b*x)], x] /; EqQ[g*(b - d*e) - h*(a - c*e)
, 0] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b*c - a*d, 0] && LinearQ[Simplify
[1/(u*(a + b*x))], x]
```

#### Rule 2315

Int[Log[(c\_.)\*(x\_)]/((d\_) + (e\_.)\*(x\_)), x\_Symbol] := -Simp[PolyLog[2, 1 - c\*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c\*d, 0]

### Rubi steps

$$\begin{aligned} \int \frac{\log\left(\frac{a-cg+bx-dgx}{a+bx}\right)}{(a+bx)(c+dx)} dx &= \int \frac{\log\left(\frac{a-cg+(b-dg)x}{a+bx}\right)}{(a+bx)(c+dx)} dx \\ &= -\frac{g \operatorname{Subst}\left(\int \frac{\log(x)}{1-x} dx, x, \frac{a-cg+(b-dg)x}{a+bx}\right)}{b(a-cg) - a(b-dg)} \\ &= \frac{\operatorname{Li}_2\left(\frac{g(c+dx)}{a+bx}\right)}{bc-ad} \end{aligned}$$

**Mathematica [B]** time = 0.161762, size = 320, normalized size = 11.85

$$-2\operatorname{PolyLog}\left(2, \frac{(a+bx)(b-dg)}{g(bc-ad)}\right) + 2\operatorname{PolyLog}\left(2, \frac{(b-dg)(c+dx)}{bc-ad}\right) - 2\operatorname{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right) + \log^2\left(\frac{g(bc-ad)}{(a+bx)(b-dg)}\right) + 2\log\left(-\frac{b(a+bx-c)}{g(bc-ad)}\right)$$

Antiderivative was successfully verified.

[In] Integrate[Log[(a - c\*g + b\*x - d\*g\*x)/(a + b\*x)]/((a + b\*x)\*(c + d\*x)), x]

[Out] (Log[((b\*c - a\*d)\*g)/((b - d\*g)\*(a + b\*x))]^2 - 2\*Log[(d\*(a + b\*x))/(-(b\*c + a\*d))]\*Log[c + d\*x] + 2\*Log[c + d\*x]\*Log[-((d\*(a - c\*g + b\*x - d\*g\*x))/(b\*c - a\*d))] + 2\*Log[((b\*c - a\*d)\*g)/((b - d\*g)\*(a + b\*x))]\*Log[-((b\*(a - c\*g + b\*x - d\*g\*x))/(b\*c - a\*d)\*g)] - 2\*Log[((b\*c - a\*d)\*g)/((b - d\*g)\*(a + b\*x))]\*Log[(a - c\*g + b\*x - d\*g\*x)/(a + b\*x)] - 2\*Log[c + d\*x]\*Log[(a - c\*g + b\*x - d\*g\*x)/(a + b\*x)] - 2\*PolyLog[2, ((b - d\*g)\*(a + b\*x))/((b\*c - a\*d)\*g)] - 2\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)] + 2\*PolyLog[2, ((b - d\*g)\*(c + d\*x))/(b\*c - a\*d)]/(2\*b\*c - 2\*a\*d)

**Maple [A]** time = 0.059, size = 45, normalized size = 1.7

$$-\frac{1}{ad-bc} \operatorname{dilog}\left(\frac{-dg+b}{b} + \frac{g(ad-bc)}{b(bx+a)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int(ln((-d*g*x+b*x-c*g+a)/(b*x+a))/(b*x+a)/(d*x+c),x)`

[Out] `-1/(a*d-b*c)*dilog((-d*g+b)/b+g*(a*d-b*c)/b/(b*x+a))`

**Maxima [B]** time = 1.16915, size = 463, normalized size = 17.15

$$\left(\frac{\log(bx+a)}{bc-ad} - \frac{\log(dx+c)}{bc-ad}\right) \log\left(-\frac{d gx + c g - b x - a}{bx+a}\right) + \frac{\log(bx+a)^2 - 2 \log(bx+a) \log(dx+c)}{2(bc-ad)} - \frac{\log(bx+a) \log\left(\frac{d gx + c g - b x - a}{bx+a}\right)}{bc-ad}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(log((-d*g*x+b*x-c*g+a)/(b*x+a))/(b*x+a)/(d*x+c),x, algorithm="maxima")`

[Out] `(log(b*x + a)/(b*c - a*d) - log(d*x + c)/(b*c - a*d))*log(-(d*g*x + c*g - b*x - a)/(b*x + a)) + 1/2*(log(b*x + a)^2 - 2*log(b*x + a)*log(d*x + c))/(b*c - a*d) - (log(b*x + a)*log(((d*g - b)*a + (b*d*g - b^2)*x)/(b*c*g - a*d*g) + 1) + dilog(-((d*g - b)*a + (b*d*g - b^2)*x)/(b*c*g - a*d*g)))/(b*c - a*d) + (log(d*x + c)*log((c*d*g - b*c + (d^2*g - b*d)*x)/(b*c - a*d) + 1) + dilog(-(c*d*g - b*c + (d^2*g - b*d)*x)/(b*c - a*d)))/(b*c - a*d) + (log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))/(b*c - a*d)`

**Fricas [A]** time = 0.502986, size = 78, normalized size = 2.89

$$\frac{\text{Li}_2\left(\frac{c g + (d g - b) x - a}{b x + a} + 1\right)}{b c - a d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(log((-d*g*x+b*x-c*g+a)/(b*x+a))/(b*x+a)/(d*x+c),x, algorithm="fricas")`

[Out] `dilog((c*g + (d*g - b)*x - a)/(b*x + a) + 1)/(b*c - a*d)`

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(ln((-d\*g\*x+b\*x-c\*g+a)/(b\*x+a))/(b\*x+a)/(d\*x+c), x)

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\log\left(-\frac{d gx + c g - b x - a}{b x + a}\right)}{(b x + a)(d x + c)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(log((-d\*g\*x+b\*x-c\*g+a)/(b\*x+a))/(b\*x+a)/(d\*x+c), x, algorithm="giac")

[Out] integrate(log(-(d\*g\*x + c\*g - b\*x - a)/(b\*x + a))/((b\*x + a)\*(d\*x + c)), x)

$$3.259 \quad \int \frac{(A+B \log(e(a+bx)^n(c+dx)^{-n}))^3}{afh+bghx^2+h(bfx+agx)} dx$$

**Optimal.** Leaf size=282

$$\frac{6B^2n^2 \text{PolyLog}\left(3, \frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right) (B \log(e(a+bx)^n(c+dx)^{-n}) + A)}{h(bf-ag)} + \frac{3Bn \text{PolyLog}\left(2, \frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right) (B \log(e(a+bx)^n(c+dx)^{-n}) + A)}{h(bf-ag)}$$

[Out] -(((A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^3\*Log[1 - ((b\*f - a\*g)\*(c + d\*x))/((d\*f - c\*g)\*(a + b\*x))])/((b\*f - a\*g)\*h)) + (3\*B\*n\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^2\*PolyLog[2, ((b\*f - a\*g)\*(c + d\*x))/((d\*f - c\*g)\*(a + b\*x))])/((b\*f - a\*g)\*h) + (6\*B^2\*n^2\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])\*PolyLog[3, ((b\*f - a\*g)\*(c + d\*x))/((d\*f - c\*g)\*(a + b\*x))])/((b\*f - a\*g)\*h) + (6\*B^3\*n^3\*PolyLog[4, ((b\*f - a\*g)\*(c + d\*x))/((d\*f - c\*g)\*(a + b\*x))])/((b\*f - a\*g)\*h)

**Rubi [B]** time = 1.31199, antiderivative size = 656, normalized size of antiderivative = 2.33, number of steps used = 17, number of rules used = 11, integrand size = 51,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.216$ , Rules used = {6688, 12, 6742, 36, 31, 2503, 2502, 2315, 2506, 6610, 2508}

$$\frac{3A^2Bn \text{PolyLog}\left(2, \frac{(f+gx)(bc-ad)}{(a+bx)(df-cg)} + 1\right)}{h(bf-ag)} + \frac{6AB^2n \log(e(a+bx)^n(c+dx)^{-n}) \text{PolyLog}\left(2, \frac{(f+gx)(bc-ad)}{(a+bx)(df-cg)} + 1\right)}{h(bf-ag)} + \frac{6AB^2n^2 \text{PolyLog}\left(3, \frac{(f+gx)(bc-ad)}{(a+bx)(df-cg)} + 1\right)}{h(bf-ag)}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^3/(a\*f\*h + b\*g\*h\*x^2 + h\*(b\*f\*x + a\*g\*x)), x]

[Out] (A^3\*Log[a + b\*x])/((b\*f - a\*g)\*h) - (A^3\*Log[f + g\*x])/((b\*f - a\*g)\*h) - (3\*A^2\*B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]\*Log[-(((b\*c - a\*d)\*(f + g\*x))/((d\*f - c\*g)\*(a + b\*x)))]/((b\*f - a\*g)\*h) - (3\*A\*B^2\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]^2\*Log[-(((b\*c - a\*d)\*(f + g\*x))/((d\*f - c\*g)\*(a + b\*x)))]/((b\*f - a\*g)\*h) - (B^3\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]^3\*Log[-(((b\*c - a\*d)\*(f + g\*x))/((d\*f - c\*g)\*(a + b\*x)))]/((b\*f - a\*g)\*h) + (3\*A^2\*B\*n\*PolyLog[2, 1 + ((b\*c - a\*d)\*(f + g\*x))/((d\*f - c\*g)\*(a + b\*x))])/((b\*f - a\*g)\*h) + (6\*A\*B^2\*n\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]\*PolyLog[2, 1 + ((b\*c - a\*d)\*(f + g\*x))/((d\*f - c\*g)\*(a + b\*x))])/((b\*f - a\*g)\*h) + (3\*B^3\*n\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]^2\*PolyLog[2, 1 + ((b\*c - a\*d)\*(f + g\*x))/((d\*f - c\*g)\*(a + b\*x))])/((b\*f - a\*g)\*h) + (6\*A\*B^2\*n^2\*PolyLog[3, 1 + ((b\*c - a\*d)\*(f + g\*x))/((d\*f - c\*g)\*(a + b\*x))])/((b\*f - a\*g)\*h) + (6\*B^3\*n^2\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]\*PolyLog[3, 1 + ((b\*c - a\*d)\*(f + g\*x))/((d\*f - c\*g)\*(a + b\*x))])/((b\*f - a\*g)\*h)

)]/((b\*f - a\*g)\*h) + (6\*B^3\*n^3\*PolyLog[4, 1 + ((b\*c - a\*d)\*(f + g\*x))/((d\*f - c\*g)\*(a + b\*x))])/((b\*f - a\*g)\*h)

### Rule 6688

Int[u\_, x\_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifyIntegrandQ[v, u, x]]

### Rule 12

Int[(a\_)\*(u\_), x\_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b\_)\*(v\_) /; FreeQ[b, x]]

### Rule 6742

Int[u\_, x\_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]]

### Rule 36

Int[1/(((a\_.) + (b\_.)\*(x\_.))\*((c\_.) + (d\_.)\*(x\_.))), x\_Symbol] := Dist[b/(b\*c - a\*d), Int[1/(a + b\*x), x], x] - Dist[d/(b\*c - a\*d), Int[1/(c + d\*x), x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b\*c - a\*d, 0]

### Rule 31

Int[((a\_) + (b\_.)\*(x\_.))^-1, x\_Symbol] := Simp[Log[RemoveContent[a + b\*x, x]]/b, x] /; FreeQ[{a, b}, x]

### Rule 2503

Int[Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_.))^(p\_.)\*((c\_.) + (d\_.)\*(x\_.))^(q\_.))^(r\_.)]^(s\_.)\*(u\_), x\_Symbol] := With[{g = Coeff[Simplify[1/(u\*(a + b\*x))], x, 0], h = Coeff[Simplify[1/(u\*(a + b\*x))], x, 1]}, -Simp[(Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s\*Log[-((b\*c - a\*d)\*(g + h\*x))/((d\*g - c\*h)\*(a + b\*x))])/((b\*g - a\*h), x] + Dist[(p\*r\*s\*(b\*c - a\*d))/(b\*g - a\*h), Int[(Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^(s - 1)\*Log[-((b\*c - a\*d)\*(g + h\*x))/((d\*g - c\*h)\*(a + b\*x))])/((a + b\*x)\*(c + d\*x)), x], x] /; NeQ[b\*g - a\*h, 0] && NeQ[d\*g - c\*h, 0] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0] && LinearQ[Simplify[1/(u\*(a + b\*x))], x]

### Rule 2502

```
Int[Log[((e_.)*((c_.) + (d_.)*(x_)))/((a_.) + (b_.)*(x_))]*(u_), x_Symbol]
:> With[{g = Coeff[Simplify[1/(u*(a + b*x))], x, 0], h = Coeff[Simplify[1/(
u*(a + b*x))], x, 1]}, -Dist[(b - d*e)/(h*(b*c - a*d)), Subst[Int[Log[e*x]/
(1 - e*x), x], x, (c + d*x)/(a + b*x)], x] /; EqQ[g*(b - d*e) - h*(a - c*e)
, 0]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b*c - a*d, 0] && LinearQ[Simplify
[1/(u*(a + b*x))], x]
```

### Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

### Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))
^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s - 1))/(
(a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

### Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /; !FalseQ[w]] /; FreeQ[n, x]
```

### Rule 2508

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(u_)*PolyLog[n_, v_], x_Symbol] :> With[{g = Simplify[(v*(c +
d*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, Simp[(h*PolyLog[n
+ 1, v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s)/(b*c - a*d), x] - Dist[h*p*
r*s, Int[(PolyLog[n + 1, v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q]^r]^s - 1))/(
(a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e,
f, n, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

### Rubi steps



$$\begin{aligned}
\int \frac{(A + B \log(e(a + bx)^n(c + dx)^{-n}))^3}{afh + bghx^2 + h(bfx + agx)} dx &= \int \frac{(A + B \log(e(a + bx)^n(c + dx)^{-n}))^3}{h(a + bx)(f + gx)} dx \\
&= \frac{\int \frac{(A + B \log(e(a + bx)^n(c + dx)^{-n}))^3}{(a + bx)(f + gx)} dx}{h} \\
&= \frac{\int \left( \frac{A^3}{(a + bx)(f + gx)} + \frac{3A^2B \log(e(a + bx)^n(c + dx)^{-n})}{(a + bx)(f + gx)} + \frac{3AB^2 \log^2(e(a + bx)^n(c + dx)^{-n})}{(a + bx)(f + gx)} + \frac{B^3 \log^3(e(a + bx)^n(c + dx)^{-n})}{(a + bx)(f + gx)} \right) dx}{h} \\
&= \frac{A^3 \int \frac{1}{(a + bx)(f + gx)} dx}{h} + \frac{(3A^2B) \int \frac{\log(e(a + bx)^n(c + dx)^{-n})}{(a + bx)(f + gx)} dx}{h} + \frac{(3AB^2) \int \frac{\log^2(e(a + bx)^n(c + dx)^{-n})}{(a + bx)(f + gx)} dx}{h} \\
&= -\frac{3A^2B \log(e(a + bx)^n(c + dx)^{-n}) \log\left(-\frac{(bc - ad)(f + gx)}{(df - cg)(a + bx)}\right)}{(bf - ag)h} - \frac{3AB^2 \log^2(e(a + bx)^n(c + dx)^{-n})}{(bf - ag)h} \\
&= \frac{A^3 \log(a + bx)}{(bf - ag)h} - \frac{A^3 \log(f + gx)}{(bf - ag)h} - \frac{3A^2B \log(e(a + bx)^n(c + dx)^{-n}) \log\left(-\frac{(bc - ad)(f + gx)}{(df - cg)(a + bx)}\right)}{(bf - ag)h} \\
&= \frac{A^3 \log(a + bx)}{(bf - ag)h} - \frac{A^3 \log(f + gx)}{(bf - ag)h} - \frac{3A^2B \log(e(a + bx)^n(c + dx)^{-n}) \log\left(-\frac{(bc - ad)(f + gx)}{(df - cg)(a + bx)}\right)}{(bf - ag)h} \\
&= \frac{A^3 \log(a + bx)}{(bf - ag)h} - \frac{A^3 \log(f + gx)}{(bf - ag)h} - \frac{3A^2B \log(e(a + bx)^n(c + dx)^{-n}) \log\left(-\frac{(bc - ad)(f + gx)}{(df - cg)(a + bx)}\right)}{(bf - ag)h}
\end{aligned}$$

**Mathematica [F]** time = 2.64478, size = 0, normalized size = 0.

$$\int \frac{(A + B \log(e(a + bx)^n(c + dx)^{-n}))^3}{afh + bghx^2 + h(bfx + agx)} dx$$

Verification is Not applicable to the result.

[In] Integrate[(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^3/(a\*f\*h + b\*g\*h\*x^2 + h\*(b\*f\*x + a\*g\*x)), x]

[Out] Integrate[(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^3/(a\*f\*h + b\*g\*h\*x^2 + h\*(b\*f\*x + a\*g\*x)), x]

**Maple [F]** time = 3.54, size = 0, normalized size = 0.

$$\int \frac{1}{afh + bghx^2 + h(agx + bxf)} \left( A + B \ln \left( \frac{e(bx+a)^n}{(dx+c)^n} \right) \right)^3 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*(b\*x+a)^n/((d\*x+c)^n)))^3/(a\*f\*h+b\*g\*h\*x^2+h\*(a\*g\*x+b\*f\*x)),x)

[Out] int((A+B\*ln(e\*(b\*x+a)^n/((d\*x+c)^n)))^3/(a\*f\*h+b\*g\*h\*x^2+h\*(a\*g\*x+b\*f\*x)),x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$A^3 \left( \frac{\log(bx+a)}{(bf-ag)h} - \frac{\log(gx+f)}{(bf-ag)h} \right) - \int \frac{B^3 \log((bx+a)^n)^3 - B^3 \log((dx+c)^n)^3 + B^3 \log(e)^3 + 3AB^2 \log(e)^2 + 3A^2B \log(e)}{(bf-ag)h} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n)))^3/(a\*f\*h+b\*g\*h\*x^2+h\*(a\*g\*x+b\*f\*x)),x, algorithm="maxima")

[Out] A^3\*(log(b\*x + a)/((b\*f - a\*g)\*h) - log(g\*x + f)/((b\*f - a\*g)\*h)) - integrate(-(B^3\*log((b\*x + a)^n)^3 - B^3\*log((d\*x + c)^n)^3 + B^3\*log(e)^3 + 3\*A\*B^2\*log(e)^2 + 3\*A^2\*B\*log(e) + 3\*(B^3\*log(e) + A\*B^2)\*log((b\*x + a)^n)^2 + 3\*(B^3\*log((b\*x + a)^n) + B^3\*log(e) + A\*B^2)\*log((d\*x + c)^n)^2 + 3\*(B^3\*log(e)^2 + 2\*A\*B^2\*log(e) + A^2\*B)\*log((b\*x + a)^n) - 3\*(B^3\*log((b\*x + a)^n)^2 + B^3\*log(e)^2 + 2\*A\*B^2\*log(e) + A^2\*B + 2\*(B^3\*log(e) + A\*B^2)\*log((b\*x + a)^n))\*log((d\*x + c)^n)/(b\*g\*h\*x^2 + a\*f\*h + (b\*f\*h + a\*g\*h)\*x), x)

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{B^3 \log \left( \frac{(bx+a)^n e}{(dx+c)^n} \right)^3 + 3AB^2 \log \left( \frac{(bx+a)^n e}{(dx+c)^n} \right)^2 + 3A^2B \log \left( \frac{(bx+a)^n e}{(dx+c)^n} \right) + A^3}{bghx^2 + afh + (bf + ag)hx}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x)),x, algorithm="fricas")
```

```
[Out] integral((B^3*log((b*x + a)^n*e/(d*x + c)^n)^3 + 3*A*B^2*log((b*x + a)^n*e/(d*x + c)^n)^2 + 3*A^2*B*log((b*x + a)^n*e/(d*x + c)^n) + A^3)/(b*g*h*x^2 + a*f*h + (b*f + a*g)*h*x), x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3/(a*f*h+b*g*h*x**2+h*(a*g*x+b*f*x)),x)
```

[Out] Timed out

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B \log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A\right)^3}{bghx^2 + afh + (bf x + agx)h} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x)),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^3/(b*g*h*x^2 + a*f*h + (b*f*x + a*g*x)*h), x)
```

$$3.260 \quad \int \frac{(A+B \log(e(a+bx)^n(c+dx)^{-n}))^2}{afh+bghx^2+h(bfx+agx)} dx$$

**Optimal.** Leaf size=203

$$\frac{2Bn \text{PolyLog}\left(2, \frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right) (B \log(e(a+bx)^n(c+dx)^{-n}) + A)}{h(bf-ag)} + \frac{2B^2n^2 \text{PolyLog}\left(3, \frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)}{h(bf-ag)} - \frac{\log\left(1 - \frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)}{h(bf-ag)}$$

[Out] -(((A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^2\*Log[1 - ((b\*f - a\*g)\*(c + d\*x))/((d\*f - c\*g)\*(a + b\*x))])/((b\*f - a\*g)\*h)) + (2\*B\*n\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])\*PolyLog[2, ((b\*f - a\*g)\*(c + d\*x))/((d\*f - c\*g)\*(a + b\*x))])/((b\*f - a\*g)\*h) + (2\*B^2\*n^2\*PolyLog[3, ((b\*f - a\*g)\*(c + d\*x))/((d\*f - c\*g)\*(a + b\*x))])/((b\*f - a\*g)\*h)

**Rubi [A]** time = 0.818899, antiderivative size = 371, normalized size of antiderivative = 1.83, number of steps used = 13, number of rules used = 10, integrand size = 51,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.196$ , Rules used = {6688, 12, 6742, 36, 31, 2503, 2502, 2315, 2506, 6610}

$$\frac{2ABn \text{PolyLog}\left(2, \frac{(f+gx)(bc-ad)}{(a+bx)(df-cg)} + 1\right)}{h(bf-ag)} + \frac{2B^2n \log(e(a+bx)^n(c+dx)^{-n}) \text{PolyLog}\left(2, \frac{(f+gx)(bc-ad)}{(a+bx)(df-cg)} + 1\right)}{h(bf-ag)} + \frac{2B^2n^2 \text{PolyLog}\left(3, \frac{(f+gx)(bc-ad)}{(a+bx)(df-cg)} + 1\right)}{h(bf-ag)}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^2/(a\*f\*h + b\*g\*h\*x^2 + h\*(b\*f\*x + a\*g\*x)), x]

[Out] (A^2\*Log[a + b\*x])/((b\*f - a\*g)\*h) - (A^2\*Log[f + g\*x])/((b\*f - a\*g)\*h) - (2\*A\*B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]\*Log[-(((b\*c - a\*d)\*(f + g\*x))/((d\*f - c\*g)\*(a + b\*x)))])/((b\*f - a\*g)\*h) - (B^2\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]^2\*Log[-(((b\*c - a\*d)\*(f + g\*x))/((d\*f - c\*g)\*(a + b\*x)))])/((b\*f - a\*g)\*h) + (2\*A\*B\*n\*PolyLog[2, 1 + ((b\*c - a\*d)\*(f + g\*x))/((d\*f - c\*g)\*(a + b\*x))])/((b\*f - a\*g)\*h) + (2\*B^2\*n\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]\*PolyLog[2, 1 + ((b\*c - a\*d)\*(f + g\*x))/((d\*f - c\*g)\*(a + b\*x))])/((b\*f - a\*g)\*h) + (2\*B^2\*n^2\*PolyLog[3, 1 + ((b\*c - a\*d)\*(f + g\*x))/((d\*f - c\*g)\*(a + b\*x))])/((b\*f - a\*g)\*h)

**Rule 6688**

Int[u\_, x\_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifyIntegrandQ[v, u, x]]

Rule 12

```
Int[(a_)*(u_), x_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] := Dist[b/(b*c
- a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^-1, x_Symbol] := Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2503

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(u_), x_Symbol] := With[{g = Coeff[Simplify[1/(u*(a + b*x))],
x, 0], h = Coeff[Simplify[1/(u*(a + b*x))], x, 1]}, -Simp[(Log[e*(f*(a + b
*x))^p*(c + d*x)^q]^r]^s*Log[-(((b*c - a*d)*(g + h*x))/((d*g - c*h)*(a + b*x
))))]/(b*g - a*h), x] + Dist[(p*r*s*(b*c - a*d))/(b*g - a*h), Int[(Log[e*(f
*(a + b*x))^p*(c + d*x)^q]^r]^(s - 1)*Log[-(((b*c - a*d)*(g + h*x))/((d*g -
c*h)*(a + b*x))))]/((a + b*x)*(c + d*x)), x], x] /; NeQ[b*g - a*h, 0] && Ne
Q[d*g - c*h, 0] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a
*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0] && LinearQ[Simplify[1/(u*(a + b*x))],
x]
```

Rule 2502

```
Int[Log[((e_.)*((c_.) + (d_.)*(x_)))/((a_.) + (b_.)*(x_))]*(u_), x_Symbol]
:= With[{g = Coeff[Simplify[1/(u*(a + b*x))], x, 0], h = Coeff[Simplify[1/(
u*(a + b*x))], x, 1]}, -Dist[(b - d*e)/(h*(b*c - a*d)), Subst[Int[Log[e*x]/
(1 - e*x), x], x, (c + d*x)/(a + b*x)], x] /; EqQ[g*(b - d*e) - h*(a - c*e)
, 0] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b*c - a*d, 0] && LinearQ[Simplify
[1/(u*(a + b*x))], x]
```

Rule 2315

Int[Log[(c\_.)\*(x\_)]/((d\_) + (e\_.)\*(x\_)), x\_Symbol] := -Simp[PolyLog[2, 1 - c\*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c\*d, 0]

### Rule 2506

Int[Log[v\_]\*Log[(e\_.)\*((f\_.)\*((a\_.) + (b\_.)\*(x\_))^(p\_.)\*((c\_.) + (d\_.)\*(x\_))^(q\_.))^(r\_.)]^(s\_.)\*(u\_), x\_Symbol] := With[{g = Simplify[((v - 1)\*(c + d\*x))/(a + b\*x)], h = Simplify[u\*(a + b\*x)\*(c + d\*x)]}, -Simp[(h\*PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s)/(b\*c - a\*d), x] + Dist[h\*p\*r\*s, Int[(PolyLog[2, 1 - v]\*Log[e\*(f\*(a + b\*x)^p\*(c + d\*x)^q]^r]^s - 1)/((a + b\*x)\*(c + d\*x)), x], x] /; FreeQ[{g, h}, x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b\*c - a\*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]

### Rule 6610

Int[(u\_)\*PolyLog[n\_, v\_], x\_Symbol] := With[{w = DerivativeDivides[v, u\*v, x]}, Simp[w\*PolyLog[n + 1, v], x] /; !FalseQ[w]] /; FreeQ[n, x]

### Rubi steps

$$\begin{aligned}
 \int \frac{(A + B \log(e(a + bx)^n(c + dx)^{-n}))^2}{afh + bghx^2 + h(bfx + agx)} dx &= \int \frac{(A + B \log(e(a + bx)^n(c + dx)^{-n}))^2}{h(a + bx)(f + gx)} dx \\
 &= \frac{\int \frac{(A + B \log(e(a + bx)^n(c + dx)^{-n}))^2}{(a + bx)(f + gx)} dx}{h} \\
 &= \frac{\int \left( \frac{A^2}{(a + bx)(f + gx)} + \frac{2AB \log(e(a + bx)^n(c + dx)^{-n})}{(a + bx)(f + gx)} + \frac{B^2 \log^2(e(a + bx)^n(c + dx)^{-n})}{(a + bx)(f + gx)} \right) dx}{h} \\
 &= \frac{A^2 \int \frac{1}{(a + bx)(f + gx)} dx}{h} + \frac{(2AB) \int \frac{\log(e(a + bx)^n(c + dx)^{-n})}{(a + bx)(f + gx)} dx}{h} + \frac{B^2 \int \frac{\log^2(e(a + bx)^n(c + dx)^{-n})}{(a + bx)(f + gx)} dx}{h} \\
 &= -\frac{2AB \log(e(a + bx)^n(c + dx)^{-n}) \log\left(-\frac{(bc - ad)(f + gx)}{(df - cg)(a + bx)}\right)}{(bf - ag)h} - \frac{B^2 \log^2(e(a + bx)^n(c + dx)^{-n})}{(bf - ag)h} \\
 &= \frac{A^2 \log(a + bx)}{(bf - ag)h} - \frac{A^2 \log(f + gx)}{(bf - ag)h} - \frac{2AB \log(e(a + bx)^n(c + dx)^{-n}) \log\left(-\frac{(bc - ad)(f + gx)}{(df - cg)(a + bx)}\right)}{(bf - ag)h} \\
 &= \frac{A^2 \log(a + bx)}{(bf - ag)h} - \frac{A^2 \log(f + gx)}{(bf - ag)h} - \frac{2AB \log(e(a + bx)^n(c + dx)^{-n}) \log\left(-\frac{(bc - ad)(f + gx)}{(df - cg)(a + bx)}\right)}{(bf - ag)h}
 \end{aligned}$$

**Mathematica [B]** time = 0.835137, size = 1415, normalized size = 6.97

result too large to display

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^2/(a\*f\*h + b\*g\*h\*x^2 + h\*(b\*f\*x + a\*g\*x)),x]

[Out] (3\*Log[a + b\*x]\*(A + B\*(-(n\*Log[a + b\*x]) + n\*Log[c + d\*x] + Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]))^2 - 3\*(A + B\*(-(n\*Log[a + b\*x]) + n\*Log[c + d\*x] + Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]))^2\*Log[f + g\*x] + 3\*B\*n\*(A + B\*(-(n\*Log[a + b\*x]) + n\*Log[c + d\*x] + Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]))\*(Log[a + b\*x]^2 - 2\*(Log[a + b\*x]\*Log[(b\*(f + g\*x))/(b\*f - a\*g)] + PolyLog[2, (g\*(a + b\*x))/(-b\*f + a\*g)])) - 6\*A\*B\*n\*(Log[c + d\*x]\*(Log[(d\*(a + b\*x))/(-b\*c + a\*d)] - Log[(d\*(f + g\*x))/(d\*f - c\*g)] + PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)] - PolyLog[2, (g\*(c + d\*x))/(-d\*f + c\*g)]) + 6\*B^2\*n\*(n\*Log[a + b\*x] - n\*Log[c + d\*x] - Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]\*(Log[c + d\*x]\*(Log[(d\*(a + b\*x))/(-b\*c + a\*d)] - Log[(d\*(f + g\*x))/(d\*f - c\*g)] + PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)] - PolyLog[2, (g\*(c + d\*x))/(-d\*f + c\*g)]) + B^2\*n^2\*(Log[a + b\*x]^2\*(Log[a + b\*x] - 3\*Log[(b\*(f + g\*x))/(b\*f - a\*g)]) - 6\*Log[a + b\*x]\*PolyLog[2, (g\*(a + b\*x))/(-b\*f + a\*g)] + 6\*PolyLog[3, (g\*(a + b\*x))/(-b\*f + a\*g)]) + 3\*B^2\*n^2\*(Log[(d\*(a + b\*x))/(-b\*c + a\*d)]\*Log[c + d\*x]^2 - Log[c + d\*x]^2\*Log[(d\*(f + g\*x))/(d\*f - c\*g)] + 2\*Log[c + d\*x]\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)] - 2\*Log[c + d\*x]\*PolyLog[2, (g\*(c + d\*x))/(-d\*f + c\*g)] - 2\*PolyLog[3, (b\*(c + d\*x))/(b\*c - a\*d)] + 2\*PolyLog[3, (g\*(c + d\*x))/(-d\*f + c\*g)]) - 6\*B^2\*n^2\*((Log[a + b\*x]^2\*(Log[c + d\*x] - Log[(b\*(c + d\*x))/(b\*c - a\*d)]))/2 - Log[a + b\*x]\*Log[c + d\*x]\*Log[(b\*(f + g\*x))/(b\*f - a\*g)] - (Log[(g\*(c + d\*x))/(-d\*f + c\*g)]\*(-2\*Log[a + b\*x] + Log[(g\*(c + d\*x))/(-d\*f + c\*g)]\*(Log[(b\*(f + g\*x))/(b\*f - a\*g)] - Log[(d\*(f + g\*x))/(d\*f - c\*g)]))/2 + Log[(g\*(c + d\*x))/(-d\*f + c\*g)]\*Log[((b\*f - a\*g)\*(c + d\*x))/((d\*f - c\*g)\*(a + b\*x))]\*(Log[(b\*(f + g\*x))/(b\*f - a\*g)] - Log[(d\*(f + g\*x))/(d\*f - c\*g)]) - (Log[((b\*f - a\*g)\*(c + d\*x))/((d\*f - c\*g)\*(a + b\*x))]^2\*(Log[(-b\*c + a\*d)/(d\*(a + b\*x))] + Log[(b\*(f + g\*x))/(b\*f - a\*g]) - Log[(-b\*c + a\*d)\*(f + g\*x)/((d\*f - c\*g)\*(a + b\*x))]))/2 - Log[a + b\*x]\*PolyLog[2, (d\*(a + b\*x))/(-b\*c + a\*d)] - (Log[c + d\*x] - Log[((b\*f - a\*g)\*(c + d\*x))/((d\*f - c\*g)\*(a + b\*x))])\*PolyLog[2, (g\*(a + b\*x))/(-b\*f + a\*g)] - (Log[a + b\*x] + Log[((b\*f - a\*g)\*(c + d\*x))/((d\*f - c\*g)\*(a + b\*x))])\*PolyLog[2, (g\*(c + d\*x))/(-d\*f + c\*g)] - Log[((b\*f - a\*g)\*(c + d\*x))/((d\*f - c\*g)\*(a + b\*x))]\*(PolyLog[2, (b\*(c + d\*x))/(d\*(a + b\*x)]) - PolyLog[2, ((b\*f - a\*g)\*(c + d\*x))/((d\*f - c\*g)\*(a + b\*x))]) + PolyLog[3, (d\*(a + b\*x))/(-b\*c + a\*d)] + PolyLog[3, (g\*(a + b\*x))/(-b\*f + a\*g)] + PolyLog[3, (g\*(c + d\*x))/(-d\*f + c\*g)] + PolyLog[3, (b\*(c + d\*x))/(d\*(a + b\*x))] - PolyLog[3, ((b\*f - a\*g)\*(c + d\*x))/((d\*f - c\*g)\*(a + b\*x))])

)/(3\*(b\*f - a\*g)\*h)

**Maple [F]** time = 4.911, size = 0, normalized size = 0.

$$\int \frac{1}{afh + bghx^2 + h(agx + bxf)} \left( A + B \ln \left( \frac{e(bx + a)^n}{(dx + c)^n} \right) \right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((A+B\*ln(e\*(b\*x+a)^n/((d\*x+c)^n)))^2/(a\*f\*h+b\*g\*h\*x^2+h\*(a\*g\*x+b\*f\*x)),x)

[Out] int((A+B\*ln(e\*(b\*x+a)^n/((d\*x+c)^n)))^2/(a\*f\*h+b\*g\*h\*x^2+h\*(a\*g\*x+b\*f\*x)),x)

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$A^2 \left( \frac{\log(bx + a)}{(bf - ag)h} - \frac{\log(gx + f)}{(bf - ag)h} \right) + \int \frac{B^2 \log((bx + a)^n)^2 + B^2 \log((dx + c)^n)^2 + B^2 \log(e)^2 + 2AB \log(e) + 2(B^2 \log(e) + A*B) \log((bx + a)^n) - 2(B^2 \log(e) + A*B) \log((dx + c)^n)}{bghx^2 + afh + (bf + ag)hx} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n)))^2/(a\*f\*h+b\*g\*h\*x^2+h\*(a\*g\*x+b\*f\*x)),x, algorithm="maxima")

[Out] A^2\*(log(b\*x + a)/((b\*f - a\*g)\*h) - log(g\*x + f)/((b\*f - a\*g)\*h)) + integrate((B^2\*log((b\*x + a)^n)^2 + B^2\*log((d\*x + c)^n)^2 + B^2\*log(e)^2 + 2\*A\*B\*log(e) + 2\*(B^2\*log(e) + A\*B)\*log((b\*x + a)^n) - 2\*(B^2\*log(e) + A\*B)\*log((d\*x + c)^n))/(b\*g\*h\*x^2 + a\*f\*h + (b\*f\*h + a\*g\*h)\*x), x)

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{B^2 \log \left( \frac{(bx+a)^n e}{(dx+c)^n} \right)^2 + 2AB \log \left( \frac{(bx+a)^n e}{(dx+c)^n} \right) + A^2}{bghx^2 + afh + (bf + ag)hx}, x \right)$$



Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x)),x, algorithm="fricas")
```

```
[Out] integral((B^2*log((b*x + a)^n*e/(d*x + c)^n)^2 + 2*A*B*log((b*x + a)^n*e/(d*x + c)^n) + A^2)/(b*g*h*x^2 + a*f*h + (b*f + a*g)*h*x), x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2/(a*f*h+b*g*h*x**2+h*(a*g*x+b*f*x)),x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B \log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A\right)^2}{bghx^2 + afh + (bf x + agx)h} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x)),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^2/(b*g*h*x^2 + a*f*h + (b*f*x + a*g*x)*h), x)
```

$$3.261 \quad \int \frac{A+B \log(e(a+bx)^n(c+dx)^{-n})}{afh+bghx^2+h(bfx+agx)} dx$$

**Optimal.** Leaf size=123

$$\frac{Bn \operatorname{PolyLog}\left(2, \frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right)}{h(bf-ag)} - \frac{\log\left(1 - \frac{(c+dx)(bf-ag)}{(a+bx)(df-cg)}\right) (B \log(e(a+bx)^n(c+dx)^{-n}) + A)}{h(bf-ag)}$$

[Out] -(((A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])\*Log[1 - ((b\*f - a\*g)\*(c + d\*x))/((d\*f - c\*g)\*(a + b\*x))])/((b\*f - a\*g)\*h)) + (B\*n\*PolyLog[2, ((b\*f - a\*g)\*(c + d\*x))/((d\*f - c\*g)\*(a + b\*x))])/((b\*f - a\*g)\*h)

**Rubi [A]** time = 0.393844, antiderivative size = 163, normalized size of antiderivative = 1.33, number of steps used = 10, number of rules used = 8, integrand size = 49,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.163$ , Rules used = {6688, 12, 6742, 36, 31, 2503, 2502, 2315}

$$\frac{Bn \operatorname{PolyLog}\left(2, \frac{(f+gx)(bc-ad)}{(a+bx)(df-cg)} + 1\right)}{h(bf-ag)} + \frac{A \log(a+bx)}{h(bf-ag)} - \frac{A \log(f+gx)}{h(bf-ag)} - \frac{B \log(e(a+bx)^n(c+dx)^{-n}) \log\left(-\frac{(f+gx)(bc-ad)}{(a+bx)(df-cg)}\right)}{h(bf-ag)}$$

Antiderivative was successfully verified.

[In] Int[(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])/(a\*f\*h + b\*g\*h\*x^2 + h\*(b\*f\*x + a\*g\*x)), x]

[Out] (A\*Log[a + b\*x])/((b\*f - a\*g)\*h) - (A\*Log[f + g\*x])/((b\*f - a\*g)\*h) - (B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]\*Log[-(((b\*c - a\*d)\*(f + g\*x))/((d\*f - c\*g)\*(a + b\*x)))])/((b\*f - a\*g)\*h) + (B\*n\*PolyLog[2, 1 + ((b\*c - a\*d)\*(f + g\*x))/((d\*f - c\*g)\*(a + b\*x))])/((b\*f - a\*g)\*h)

### Rule 6688

Int[u\_, x\_Symbol] := With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; SimplifyIntegrandQ[v, u, x]]

### Rule 12

Int[(a\_)\*(u\_), x\_Symbol] := Dist[a, Int[u, x], x] /; FreeQ[a, x] && !MatchQ[u, (b\_)\*(v\_) /; FreeQ[b, x]]

### Rule 6742

```
Int[u_, x_Symbol] := With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

### Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] := Dist[b/(b*c
- a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

### Rule 31

```
Int[((a_) + (b_.)*(x_))^-1, x_Symbol] := Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

### Rule 2503

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(u_), x_Symbol] := With[{g = Coeff[Simplify[1/(u*(a + b*x))],
x, 0], h = Coeff[Simplify[1/(u*(a + b*x))], x, 1]}, -Simp[(Log[e*(f*(a + b
*x))^p*(c + d*x)^q]^r]^s*Log[-(((b*c - a*d)*(g + h*x))/((d*g - c*h)*(a + b*x
))))]/(b*g - a*h), x] + Dist[(p*r*s*(b*c - a*d))/(b*g - a*h), Int[(Log[e*(f
*(a + b*x))^p*(c + d*x)^q]^r]^(s - 1)*Log[-(((b*c - a*d)*(g + h*x))/((d*g -
c*h)*(a + b*x))))]/((a + b*x)*(c + d*x)), x], x] /; NeQ[b*g - a*h, 0] && Ne
Q[d*g - c*h, 0] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a
*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0] && LinearQ[Simplify[1/(u*(a + b*x))],
x]
```

### Rule 2502

```
Int[Log[((e_.)*((c_.) + (d_.)*(x_)))/((a_.) + (b_.)*(x_))]*(u_), x_Symbol]
:= With[{g = Coeff[Simplify[1/(u*(a + b*x))], x, 0], h = Coeff[Simplify[1/(
u*(a + b*x))], x, 1]}, -Dist[(b - d*e)/(h*(b*c - a*d)), Subst[Int[Log[e*x]/
(1 - e*x), x], x, (c + d*x)/(a + b*x)], x] /; EqQ[g*(b - d*e) - h*(a - c*e)
, 0] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b*c - a*d, 0] && LinearQ[Simplify
[1/(u*(a + b*x))], x]
```

### Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] := -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

### Rubi steps

$$\begin{aligned}
\int \frac{A + B \log(e(a + bx)^n(c + dx)^{-n})}{afh + bghx^2 + h(bfx + agx)} dx &= \int \frac{A + B \log(e(a + bx)^n(c + dx)^{-n})}{h(a + bx)(f + gx)} dx \\
&= \frac{\int \frac{A + B \log(e(a + bx)^n(c + dx)^{-n})}{(a + bx)(f + gx)} dx}{h} \\
&= \frac{\int \left( \frac{A}{(a + bx)(f + gx)} + \frac{B \log(e(a + bx)^n(c + dx)^{-n})}{(a + bx)(f + gx)} \right) dx}{h} \\
&= \frac{A \int \frac{1}{(a + bx)(f + gx)} dx}{h} + \frac{B \int \frac{\log(e(a + bx)^n(c + dx)^{-n})}{(a + bx)(f + gx)} dx}{h} \\
&= -\frac{B \log(e(a + bx)^n(c + dx)^{-n}) \log\left(-\frac{(bc - ad)(f + gx)}{(df - cg)(a + bx)}\right)}{(bf - ag)h} + \frac{(Ab) \int \frac{1}{a + bx} dx}{(bf - ag)h} - \frac{(Ag) \int \frac{1}{f + gx} dx}{(bf - ag)h} \\
&= \frac{A \log(a + bx)}{(bf - ag)h} - \frac{A \log(f + gx)}{(bf - ag)h} - \frac{B \log(e(a + bx)^n(c + dx)^{-n}) \log\left(-\frac{(bc - ad)(f + gx)}{(df - cg)(a + bx)}\right)}{(bf - ag)h} \\
&= \frac{A \log(a + bx)}{(bf - ag)h} - \frac{A \log(f + gx)}{(bf - ag)h} - \frac{B \log(e(a + bx)^n(c + dx)^{-n}) \log\left(-\frac{(bc - ad)(f + gx)}{(df - cg)(a + bx)}\right)}{(bf - ag)h}
\end{aligned}$$

**Mathematica [B]** time = 0.257613, size = 303, normalized size = 2.46

$$2Bn \text{PolyLog}\left(2, \frac{b(c+dx)}{bc-ad}\right) + 2Bn \text{PolyLog}\left(2, \frac{g(a+bx)}{ag-bf}\right) - 2Bn \text{PolyLog}\left(2, \frac{g(c+dx)}{cg-df}\right) - 2A \log(a + bx) + 2B \log(f + gx) \log\left(-\frac{(bc-ad)(f+gx)}{(df-cg)(a+bx)}\right)$$

Antiderivative was successfully verified.

[In] Integrate[(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])/(a\*f\*h + b\*g\*h\*x^2 + h\*(b\*f\*x + a\*g\*x)),x]

[Out] -((-2\*A\*Log[a + b\*x] + B\*n\*Log[a + b\*x]^2 - 2\*B\*n\*Log[a + b\*x]\*Log[c + d\*x] + 2\*B\*n\*Log[(d\*(a + b\*x))/(-b\*c) + a\*d])\*Log[c + d\*x] - 2\*B\*Log[a + b\*x]\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n] + 2\*A\*Log[f + g\*x] - 2\*B\*n\*Log[a + b\*x]\*Log[f + g\*x] + 2\*B\*n\*Log[c + d\*x]\*Log[f + g\*x] + 2\*B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n]\*Log[f + g\*x] + 2\*B\*n\*Log[a + b\*x]\*Log[(b\*(f + g\*x))/(b\*f - a\*g)] - 2\*B\*n\*Log[c + d\*x]\*Log[(d\*(f + g\*x))/(d\*f - c\*g)] + 2\*B\*n\*PolyLog[2, (g\*(a + b\*x))/(-b\*f) + a\*g] + 2\*B\*n\*PolyLog[2, (b\*(c + d\*x))/(b\*c - a\*d)] - 2\*B\*n\*PolyLog[2, (g\*(c + d\*x))/(-d\*f) + c\*g])/((2\*b\*f - 2\*a\*g)\*h))

---

**Maple [C]** time = 0.711, size = 1447, normalized size = 11.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In]  $\text{int}((A+B*\ln(e*(b*x+a)^n/((d*x+c)^n)))/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x)),x)$

[Out]  $B/h^n/(a*g-b*f)*\text{dilog}((d*(g*x+f)+c*g-d*f)/(c*g-d*f))-B/h^n/(a*g-b*f)*\text{dilog}((-a*d+b*c+d*(b*x+a))/(-a*d+b*c))+1/h/(a*g-b*f)*\ln(g*x+f)*B*\ln(e)-1/h/(a*g-b*f)*\ln(b*x+a)*B*\ln(e)+1/h*B/(a*g-b*f)*\ln(g*x+f)*\ln((b*x+a)^n)-1/h*B^n/(a*g-b*f)*\ln(g*x+f)*\ln((b*(g*x+f)+a*g-b*f)/(a*g-b*f))+B/h^n/(a*g-b*f)*\ln(g*x+f)*\ln((d*(g*x+f)+c*g-d*f)/(c*g-d*f))-B/h^n/(a*g-b*f)*\ln(b*x+a)*\ln((-a*d+b*c+d*(b*x+a))/(-a*d+b*c))-B/h*\ln((d*x+c)^n)/(a*g-b*f)*\ln(g*x+f)+B/h*\ln((d*x+c)^n)/(a*g-b*f)*\ln(b*x+a)-1/h*B*\ln((b*x+a)^n)/(a*g-b*f)*\ln(b*x+a)+1/2*I/h/(a*g-b*f)*\ln(b*x+a)*B*Pi*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-1/2*I/h/(a*g-b*f)*\ln(g*x+f)*B*Pi*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-1/h*A/(a*g-b*f)*\ln(b*x+a)+1/h*A/(a*g-b*f)*\ln(g*x+f)+1/2*I/h/(a*g-b*f)*\ln(b*x+a)*B*Pi*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-1/2*I/h/(a*g-b*f)*\ln(b*x+a)*B*Pi*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I/h/(a*g-b*f)*\ln(g*x+f)*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-1/2*I/h/(a*g-b*f)*\ln(b*x+a)*B*Pi*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-1/h*B^n/(a*g-b*f)*\text{dilog}((b*(g*x+f)+a*g-b*f)/(a*g-b*f))+1/2/h*B^n/(a*g-b*f)*\ln(b*x+a)^2+1/2*I/h/(a*g-b*f)*\ln(g*x+f)*B*Pi*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I/h/(a*g-b*f)*\ln(g*x+f)*B*Pi*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-1/2*I/h/(a*g-b*f)*\ln(b*x+a)*B*Pi*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I/h/(a*g-b*f)*\ln(g*x+f)*B*Pi*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I/h/(a*g-b*f)*\ln(b*x+a)*B*Pi*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-1/2*I/h/(a*g-b*f)*\ln(g*x+f)*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-1/2*I/h/(a*g-b*f)*\ln(g*x+f)*B*Pi*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-1/2*I/h/(a*g-b*f)*\ln(g*x+f)*B*Pi*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+1/2*I/h/(a*g-b*f)*\ln(b*x+a)*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))^3$

---

**Maxima [F]** time = 0., size = 0, normalized size = 0.

$$A \left( \frac{\log(bx+a)}{(bf-ag)h} - \frac{\log(gx+f)}{(bf-ag)h} \right) - B \int -\frac{\log((bx+a)^n) - \log((dx+c)^n) + \log(e)}{bghx^2 + afh + (bfh + agh)x} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x)),x, algorithm="maxima")
```

```
[Out] A*(log(b*x + a)/((b*f - a*g)*h) - log(g*x + f)/((b*f - a*g)*h)) - B*integrate(-log((b*x + a)^n) - log((d*x + c)^n) + log(e))/(b*g*h*x^2 + a*f*h + (b*f*h + a*g*h)*x), x)
```

**Fricas [F]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{B \log \left( \frac{(bx+a)^n e}{(dx+c)^n} \right) + A}{bghx^2 + afh + (bf + ag)hx}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x)),x, algorithm="fricas")
```

```
[Out] integral((B*log((b*x + a)^n*e/(d*x + c)^n) + A)/(b*g*h*x^2 + a*f*h + (b*f + a*g)*h*x), x)
```

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))/(a*f*h+b*g*h*x**2+h*(a*g*x+b*f*x)),x)
```

```
[Out] Timed out
```

**Giac [F]** time = 0., size = 0, normalized size = 0.

$$\int \frac{B \log \left( \frac{(bx+a)^n e}{(dx+c)^n} \right) + A}{bghx^2 + afh + (bf + ag)hx} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(a*f*h+b*g*h*x^2+h*(a*g*x+b*f*x)),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)/(b*g*h*x^2 + a*f*h + (b*f*x + a*g*x)*h), x)
```

$$3.262 \quad \int \frac{1}{(afh + bghx^2 + h(bfx + agx))(A + B \log(e(a+bx)^n(c+dx)^{-n}))} dx$$

**Optimal.** Leaf size=82

$$\frac{\text{Subst} \left( \text{Unintegrable} \left( \frac{1}{(a+bx)(f+gx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)}, x \right), e \left( \frac{a+bx}{c+dx} \right)^n, e(a+bx)^n(c+dx)^{-n} \right)}{h}$$

[Out] Defer[Subst][Unintegrable[1/((a + b\*x)\*(f + g\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])), x], e\*((a + b\*x)/(c + d\*x))^n, (e\*(a + b\*x)^n)/(c + d\*x)^n]/h

**Rubi [A]** time = 0.430517, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.$ , Rules used = {}

$$\int \frac{1}{(afh + bghx^2 + h(bfx + agx))(A + B \log(e(a+bx)^n(c+dx)^{-n}))} dx$$

Verification is Not applicable to the result.

[In] Int[1/((a\*f\*h + b\*g\*h\*x^2 + h\*(b\*f\*x + a\*g\*x))\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])), x]

[Out] (b\*Defer[Int][1/((a + b\*x)\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])), x])/(b\*f - a\*g)\*h - (g\*Defer[Int][1/((f + g\*x)\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])), x])/(b\*f - a\*g)\*h

Rubi steps



$$\begin{aligned}
\int \frac{1}{(afh + bghx^2 + h(bfx + agx))(A + B \log(e(a + bx)^n(c + dx)^{-n}))} dx &= \int \frac{1}{h(a + bx)(f + gx)(A + B \log(e(a + bx)^n(c + dx)^{-n}))} dx \\
&= \int \frac{1}{(a+bx)(f+gx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))} dx \\
&= \frac{1}{h} \int \left( \frac{b}{(bf-ag)(a+bx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))} - \frac{1}{(bf-ag)(a+bx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))} \right) dx \\
&= \frac{b \int \frac{1}{(a+bx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))} dx}{(bf-ag)h} - \frac{1}{(bf-ag)h} \int \frac{1}{(a+bx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))} dx
\end{aligned}$$

**Mathematica [A]** time = 0.132721, size = 0, normalized size = 0.

$$\int \frac{1}{(afh + bghx^2 + h(bfx + agx))(A + B \log(e(a + bx)^n(c + dx)^{-n}))} dx$$

Verification is Not applicable to the result.

[In] Integrate[1/((a\*f\*h + b\*g\*h\*x^2 + h\*(b\*f\*x + a\*g\*x))\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x]^n))], x]

[Out] Integrate[1/((a\*f\*h + b\*g\*h\*x^2 + h\*(b\*f\*x + a\*g\*x))\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x]^n))], x]

**Maple [A]** time = 12.227, size = 0, normalized size = 0.

$$\int \frac{1}{afh + bghx^2 + h(agx + bxf)} \left( A + B \ln \left( \frac{e(bx + a)^n}{(dx + c)^n} \right) \right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(a\*f\*h+b\*g\*h\*x^2+h\*(a\*g\*x+b\*f\*x))/(A+B\*ln(e\*(b\*x+a)^n/((d\*x+c)^n))), x)

[Out] int(1/(a\*f\*h+b\*g\*h\*x^2+h\*(a\*g\*x+b\*f\*x))/(A+B\*ln(e\*(b\*x+a)^n/((d\*x+c)^n))), x)

---

**Maxima [A]** time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bghx^2 + afh + (bf x + agx)h) \left( B \log \left( \frac{(bx+a)^n e}{(dx+c)^n} \right) + A \right)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(a\*f\*h+b\*g\*h\*x^2+h\*(a\*g\*x+b\*f\*x))/(A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n))),x, algorithm="maxima")

[Out] integrate(1/((b\*g\*h\*x^2 + a\*f\*h + (b\*f\*x + a\*g\*x)\*h)\*(B\*log((b\*x + a)^n\*e/(d\*x + c)^n) + A)), x)

---

**Fricas [A]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{1}{Abghx^2 + Aafh + (Abf + Aag)hx + (Bbghx^2 + Bafh + (Bbf + Bag)hx) \log \left( \frac{(bx+a)^n e}{(dx+c)^n} \right)}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(a\*f\*h+b\*g\*h\*x^2+h\*(a\*g\*x+b\*f\*x))/(A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n))),x, algorithm="fricas")

[Out] integral(1/(A\*b\*g\*h\*x^2 + A\*a\*f\*h + (A\*b\*f + A\*a\*g)\*h\*x + (B\*b\*g\*h\*x^2 + B\*a\*f\*h + (B\*b\*f + B\*a\*g)\*h\*x)\*log((b\*x + a)^n\*e/(d\*x + c)^n)), x)

---

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(a\*f\*h+b\*g\*h\*x\*\*2+h\*(a\*g\*x+b\*f\*x))/(A+B\*ln(e\*(b\*x+a)\*\*n/((d\*x+c)\*\*n))),x)

[Out] Timed out

**Giac [A]** time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bghx^2 + afh + (bf x + agx)h) \left( B \log \left( \frac{(bx+a)^n e}{(dx+c)^n} \right) + A \right)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(a\*f\*h+b\*g\*h\*x^2+h\*(a\*g\*x+b\*f\*x))/(A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n))),x, algorithm="giac")

[Out] integrate(1/((b\*g\*h\*x^2 + a\*f\*h + (b\*f\*x + a\*g\*x)\*h)\*(B\*log((b\*x + a)^n\*e/(d\*x + c)^n) + A)), x)

$$3.263 \quad \int \frac{1}{(afh + bghx^2 + h(bfx + agx))(A + B \log(e(a+bx)^n(c+dx)^{-n}))^2} dx$$

**Optimal.** Leaf size=82

$$\frac{\text{Subst} \left( \text{Unintegrable} \left( \frac{1}{(a+bx)(f+gx) \left( B \log \left( e \left( \frac{a+bx}{c+dx} \right)^n \right) + A \right)^2}, x \right), e \left( \frac{a+bx}{c+dx} \right)^n, e(a+bx)^n(c+dx)^{-n} \right)}{h}$$

[Out] Defer[Subst][Unintegrable[1/((a + b\*x)\*(f + g\*x)\*(A + B\*Log[e\*((a + b\*x)/(c + d\*x))^n])^2), x], e\*((a + b\*x)/(c + d\*x))^n, (e\*(a + b\*x)^n)/(c + d\*x)^n ]/h

**Rubi [A]** time = 0.459884, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.$ , Rules used = {}

$$\int \frac{1}{(afh + bghx^2 + h(bfx + agx))(A + B \log(e(a+bx)^n(c+dx)^{-n}))^2} dx$$

Verification is Not applicable to the result.

[In] Int[1/((a\*f\*h + b\*g\*h\*x^2 + h\*(b\*f\*x + a\*g\*x))\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^2), x]

[Out] (b\*Defer[Int][1/((a + b\*x)\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^2), x]) / ((b\*f - a\*g)\*h) - (g\*Defer[Int][1/((f + g\*x)\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x)^n])^2), x]) / ((b\*f - a\*g)\*h)

Rubi steps

$$\begin{aligned} \int \frac{1}{(afh + bghx^2 + h(bfx + agx))(A + B \log(e(a + bx)^n(c + dx)^{-n}))^2} dx &= \int \frac{1}{h(a + bx)(f + gx)(A + B \log(e(a + bx)^n(c + dx)^{-n}))^2} dx \\ &= \int \frac{1}{(a+bx)(f+gx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))^2} dx \\ &= \frac{1}{h} \int \left( \frac{b}{(bf-ag)(a+bx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))^2} - \frac{g}{(af-ag)(a+bx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))^2} \right) dx \\ &= \frac{b \int \frac{1}{(a+bx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))^2} dx}{(bf-ag)h} - \frac{g \int \frac{1}{(a+bx)(A+B \log(e(a+bx)^n(c+dx)^{-n}))^2} dx}{(af-ag)h} \end{aligned}$$

**Mathematica [A]** time = 0.268337, size = 0, normalized size = 0.

$$\int \frac{1}{(afh + bghx^2 + h(bfx + agx))(A + B \log(e(a + bx)^n(c + dx)^{-n}))^2} dx$$

Verification is Not applicable to the result.

[In] Integrate[1/((a\*f\*h + b\*g\*h\*x^2 + h\*(b\*f\*x + a\*g\*x))\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x]^n))^2), x]

[Out] Integrate[1/((a\*f\*h + b\*g\*h\*x^2 + h\*(b\*f\*x + a\*g\*x))\*(A + B\*Log[(e\*(a + b\*x)^n)/(c + d\*x]^n))^2), x]

**Maple [A]** time = 4.622, size = 0, normalized size = 0.

$$\int \frac{1}{afh + bghx^2 + h(agx + bxf)} \left( A + B \ln \left( \frac{e(bx + a)^n}{(dx + c)^n} \right) \right)^{-2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(a\*f\*h+b\*g\*h\*x^2+h\*(a\*g\*x+b\*f\*x))/(A+B\*ln(e\*(b\*x+a)^n/((d\*x+c)^n)))^2, x)

[Out] int(1/(a\*f\*h+b\*g\*h\*x^2+h\*(a\*g\*x+b\*f\*x))/(A+B\*ln(e\*(b\*x+a)^n/((d\*x+c)^n)))^2, x)

---

**Maxima [A]** time = 0., size = 0, normalized size = 0.

$$(df - cg) \int \frac{1}{(bcf^2hn - adf^2hn)AB + (bcf^2hn \log(e) - adf^2hn \log(e))B^2 + ((bcg^2hn - adg^2hn)AB + (bcg^2hn \log(e) - adg^2hn \log(e))B^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(a\*f\*h+b\*g\*h\*x^2+h\*(a\*g\*x+b\*f\*x))/(A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n)))^2,x, algorithm="maxima")

[Out] (d\*f - c\*g)\*integrate(1/((b\*c\*f^2\*h\*n - a\*d\*f^2\*h\*n)\*A\*B + (b\*c\*f^2\*h\*n\*log(e) - a\*d\*f^2\*h\*n\*log(e))\*B^2 + ((b\*c\*g^2\*h\*n - a\*d\*g^2\*h\*n)\*A\*B + (b\*c\*g^2\*h\*n\*log(e) - a\*d\*g^2\*h\*n\*log(e))\*B^2)\*x^2 + 2\*((b\*c\*f\*g\*h\*n - a\*d\*f\*g\*h\*n)\*A\*B + (b\*c\*f\*g\*h\*n\*log(e) - a\*d\*f\*g\*h\*n\*log(e))\*B^2)\*x + ((b\*c\*g^2\*h\*n - a\*d\*g^2\*h\*n)\*B^2\*x^2 + 2\*(b\*c\*f\*g\*h\*n - a\*d\*f\*g\*h\*n)\*B^2\*x + (b\*c\*f^2\*h\*n - a\*d\*f^2\*h\*n)\*B^2)\*log((b\*x + a)^n) - ((b\*c\*g^2\*h\*n - a\*d\*g^2\*h\*n)\*B^2\*x^2 + 2\*(b\*c\*f\*g\*h\*n - a\*d\*f\*g\*h\*n)\*B^2\*x + (b\*c\*f^2\*h\*n - a\*d\*f^2\*h\*n)\*B^2)\*log((d\*x + c)^n)), x) - (d\*x + c)/((b\*c\*f\*h\*n - a\*d\*f\*h\*n)\*A\*B + (b\*c\*f\*h\*n\*log(e) - a\*d\*f\*h\*n\*log(e))\*B^2 + ((b\*c\*g\*h\*n - a\*d\*g\*h\*n)\*A\*B + (b\*c\*g\*h\*n\*log(e) - a\*d\*g\*h\*n\*log(e))\*B^2)\*x + ((b\*c\*g\*h\*n - a\*d\*g\*h\*n)\*B^2\*x + (b\*c\*f\*h\*n - a\*d\*f\*h\*n)\*B^2)\*log((b\*x + a)^n) - ((b\*c\*g\*h\*n - a\*d\*g\*h\*n)\*B^2\*x + (b\*c\*f\*h\*n - a\*d\*f\*h\*n)\*B^2)\*log((d\*x + c)^n))

---

**Fricas [A]** time = 0., size = 0, normalized size = 0.

$$\text{integral} \left( \frac{1}{A^2bghx^2 + A^2afh + (A^2bf + A^2ag)hx + (B^2bghx^2 + B^2afh + (B^2bf + B^2ag)hx) \log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2 + 2(ABbghx^2 + ABafh + (ABbf + ABag)hx) \log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(a\*f\*h+b\*g\*h\*x^2+h\*(a\*g\*x+b\*f\*x))/(A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n)))^2,x, algorithm="fricas")

[Out] integral(1/(A^2\*b\*g\*h\*x^2 + A^2\*a\*f\*h + (A^2\*b\*f + A^2\*a\*g)\*h\*x + (B^2\*b\*g\*h\*x^2 + B^2\*a\*f\*h + (B^2\*b\*f + B^2\*a\*g)\*h\*x)\*log((b\*x + a)^n\*e/(d\*x + c)^n)^2 + 2\*(A\*B\*b\*g\*h\*x^2 + A\*B\*a\*f\*h + (A\*B\*b\*f + A\*B\*a\*g)\*h\*x)\*log((b\*x + a)^n\*e/(d\*x + c)^n)), x)

---

**Sympy [F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(a\*f\*h+b\*g\*h\*x\*\*2+h\*(a\*g\*x+b\*f\*x))/(A+B\*ln(e\*(b\*x+a)\*\*n/((d\*x+c)\*\*n)))\*\*2,x)

[Out] Timed out

---

**Giac [A]** time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bghx^2 + afh + (bf x + agx)h) \left( B \log \left( \frac{(bx+a)^n e}{(dx+c)^n} \right) + A \right)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(a\*f\*h+b\*g\*h\*x^2+h\*(a\*g\*x+b\*f\*x))/(A+B\*log(e\*(b\*x+a)^n/((d\*x+c)^n)))^2,x, algorithm="giac")

[Out] integrate(1/((b\*g\*h\*x^2 + a\*f\*h + (b\*f\*x + a\*g\*x)\*h)\*(B\*log((b\*x + a)^n\*e/(d\*x + c)^n) + A)^2), x)





# Chapter 4

## Listing of Grading functions

The following are the current version of the grading functions used for grading the quality of the antiderivative with reference to the optimal antiderivative included in the test suite.

There is a version for Maple and for Mathematica/Rubi. There is a version for grading Sympy and version for use with Sagemath.

The following are links to the current source code.

The following are the listings of source code of the grading functions.

### 4.0.1 Mathematica and Rubi grading function

```
1 (* Original version thanks to Albert Rich emailed on 03/21/2017 *)
2 (* ::Package:: *)
3
4 (* ::Subsection:: *)
5 (*GradeAntiderivative[result,optimal]*)
6
7
8 (* ::Text:: *)
9 (*If result and optimal are mathematical expressions, *)
10 (*      GradeAntiderivative[result,optimal] returns*)
11 (* "F" if the result fails to integrate an expression that*)
12 (*      is integrable*)
13 (* "C" if result involves higher level functions than necessary*)
14 (* "B" if result is more than twice the size of the optimal*)
15 (*      antiderivative*)
16 (* "A" if result can be considered optimal*)
17
18
19 GradeAntiderivative[result_,optimal_] :=
20   If[ExpnType[result]<=ExpnType[optimal],
21     If[FreeQ[result,Complex] || Not[FreeQ[optimal,Complex]],
```

```

22     If[LeafCount[result]<=2*LeafCount[optimal],
23         "A",
24         "B"],
25     "C"],
26 If[FreeQ[result,Integrate] && FreeQ[result,Int],
27     "C",
28     "F"]]
29
30
31 (* ::Text:: *)
32 (*The following summarizes the type number assigned an *)
33 (*expression based on the functions it involves*)
34 (*1 = rational function*)
35 (*2 = algebraic function*)
36 (*3 = elementary function*)
37 (*4 = special function*)
38 (*5 = hyperpergeometric function*)
39 (*6 = appell function*)
40 (*7 = rootsum function*)
41 (*8 = integrate function*)
42 (*9 = unknown function*)
43
44
45 ExpnType[expn_] :=
46     If[AtomQ[expn],
47         1,
48     If[ListQ[expn],
49         Max[Map[ExpnType,expn]],
50     If[Head[expn]===Power,
51         If[IntegerQ[expn[[2]]],
52             ExpnType[expn[[1]]],
53         If[Head[expn[[2]]]===Rational,
54             If[IntegerQ[expn[[1]]] || Head[expn[[1]]]===Rational,
55                 1,
56                 Max[ExpnType[expn[[1]],2]],
57             Max[ExpnType[expn[[1]],ExpnType[expn[[2]],3]],
58     If[Head[expn]===Plus || Head[expn]===Times,
59         Max[ExpnType[First[expn]],ExpnType[Rest[expn]]],
60     If[ElementaryFunctionQ[Head[expn]],
61         Max[3,ExpnType[expn[[1]]],
62     If[SpecialFunctionQ[Head[expn]],
63         Apply[Max,Append[Map[ExpnType,Apply[List,expn]],4]],
64     If[HypergeometricFunctionQ[Head[expn]],
65         Apply[Max,Append[Map[ExpnType,Apply[List,expn]],5]],
66     If[AppellFunctionQ[Head[expn]],
67         Apply[Max,Append[Map[ExpnType,Apply[List,expn]],6]],
68     If[Head[expn]===RootSum,
```

```

69   Apply[Max, Append[Map[ExpnType, Apply[List, expn]], 7]],
70   If[Head[expn]===Integrate || Head[expn]===Int,
71     Apply[Max, Append[Map[ExpnType, Apply[List, expn]], 8]],
72   9]]]]]]]]]]
73
74
75 ElementaryFunctionQ[func_] :=
76   MemberQ[{
77     Exp, Log,
78     Sin, Cos, Tan, Cot, Sec, Csc,
79     ArcSin, ArcCos, ArcTan, ArcCot, ArcSec, ArcCsc,
80     Sinh, Cosh, Tanh, Coth, Sech, Csch,
81     ArcSinh, ArcCosh, ArcTanh, ArcCoth, ArcSech, ArcCsch
82   }, func]
83
84
85 SpecialFunctionQ[func_] :=
86   MemberQ[{
87     Erf, Erfc, Erfi,
88     FresnelS, FresnelC,
89     ExpIntegralE, ExpIntegralEi, LogIntegral,
90     SinIntegral, CosIntegral, SinhIntegral, CoshIntegral,
91     Gamma, LogGamma, PolyGamma,
92     Zeta, PolyLog, ProductLog,
93     EllipticF, EllipticE, EllipticPi
94   }, func]
95
96
97 HypergeometricFunctionQ[func_] :=
98   MemberQ[{Hypergeometric1F1, Hypergeometric2F1, HypergeometricPFQ}, func]
99
100
101 AppellFunctionQ[func_] :=
102   MemberQ[{AppellF1}, func]

```

## 4.0.2 Maple grading function

```

1 # File: GradeAntiderivative.mpl
2 # Original version thanks to Albert Rich emailed on 03/21/2017
3
4 #Nasser 03/22/2017 Use Maple leaf count instead since buildin
5 #Nasser 03/23/2017 missing 'ln' for ElementaryFunctionQ added
6 #Nasser 03/24/2017 corrected the check for complex result
7 #Nasser 10/27/2017 check for leafsize and do not call ExpnType()
8 #
9 #Nasser 12/22/2019 Added debug flag, added 'dilog' to special functions
10 #
11 see problem 156, file Apostol_Problems

```

```

11
12 GradeAntiderivative := proc(result,optimal)
13 local leaf_count_result, leaf_count_optimal,ExpnType_result,ExpnType_optimal,
    debug:=false;
14
15     leaf_count_result:=leafcount(result);
16     #do NOT call ExpnType() if leaf size is too large. Recursion problem
17     if leaf_count_result > 500000 then
18         return "B";
19     fi;
20
21     leaf_count_optimal:=leafcount(optimal);
22
23     ExpnType_result:=ExpnType(result);
24     ExpnType_optimal:=ExpnType(optimal);
25
26     if debug then
27         print("ExpnType_result",ExpnType_result," ExpnType_optimal=",
    ExpnType_optimal);
28     fi;
29
30 # If result and optimal are mathematical expressions,
31 # GradeAntiderivative[result,optimal] returns
32 #   "F" if the result fails to integrate an expression that
33 #     is integrable
34 #   "C" if result involves higher level functions than necessary
35 #   "B" if result is more than twice the size of the optimal
36 #     antiderivative
37 #   "A" if result can be considered optimal
38
39 #This check below actually is not needed, since I only
40 #call this grading only for passed integrals. i.e. I check
41 #for "F" before calling this. But no harm of keeping it here.
42 #just in case.
43
44
45 if not type(result,freeof('int')) then
46     return "F";
47 end if;
48
49
50 if ExpnType_result<=ExpnType_optimal then
51     if debug then
52         print("ExpnType_result<=ExpnType_optimal");
53     fi;
54     if is_contains_complex(result) then
55         if is_contains_complex(optimal) then

```

```

56     if debug then
57         print("both result and optimal complex");
58     fi;
59     #both result and optimal complex
60     if leaf_count_result<=2*leaf_count_optimal then
61         return "A";
62     else
63         return "B";
64     end if
65     else #result contains complex but optimal is not
66         if debug then
67             print("result contains complex but optimal is not");
68         fi;
69         return "C";
70     end if
71     else # result do not contain complex
72         # this assumes optimal do not as well
73         if debug then
74             print("result do not contain complex, this assumes optimal do not
as well");
75         fi;
76         if leaf_count_result<=2*leaf_count_optimal then
77             if debug then
78                 print("leaf_count_result<=2*leaf_count_optimal");
79             fi;
80             return "A";
81         else
82             if debug then
83                 print("leaf_count_result>2*leaf_count_optimal");
84             fi;
85             return "B";
86         end if
87     end if
88     else #ExpnType(result) > ExpnType(optimal)
89         if debug then
90             print("ExpnType(result) > ExpnType(optimal)");
91         fi;
92         return "C";
93     end if
94
95 end proc:
96
97 #
98 # is_contains_complex(result)
99 # takes expressions and returns true if it contains "I" else false
100 #
101 #Nasser 032417

```

```

102 is_contains_complex:= proc(expression)
103   return (has(expression,I));
104 end proc:
105
106 # The following summarizes the type number assigned an expression
107 # based on the functions it involves
108 # 1 = rational function
109 # 2 = algebraic function
110 # 3 = elementary function
111 # 4 = special function
112 # 5 = hyperpergeometric function
113 # 6 = appell function
114 # 7 = rootsum function
115 # 8 = integrate function
116 # 9 = unknown function
117
118 ExpnType := proc(expn)
119   if type(expn,'atomic') then
120     1
121   elif type(expn,'list') then
122     apply(max,map(ExpnType,expn))
123   elif type(expn,'sqrt') then
124     if type(op(1,expn),'rational') then
125       1
126     else
127       max(2,ExpnType(op(1,expn)))
128     end if
129   elif type(expn,'^^') then
130     if type(op(2,expn),'integer') then
131       ExpnType(op(1,expn))
132     elif type(op(2,expn),'rational') then
133       if type(op(1,expn),'rational') then
134         1
135       else
136         max(2,ExpnType(op(1,expn)))
137       end if
138     else
139       max(3,ExpnType(op(1,expn)),ExpnType(op(2,expn)))
140     end if
141   elif type(expn,'^+^') or type(expn,'`*`') then
142     max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
143   elif ElementaryFunctionQ(op(0,expn)) then
144     max(3,ExpnType(op(1,expn)))
145   elif SpecialFunctionQ(op(0,expn)) then
146     max(4,apply(max,map(ExpnType,[op(expn)])))
147   elif HypergeometricFunctionQ(op(0,expn)) then
148     max(5,apply(max,map(ExpnType,[op(expn)])))

```

```

149   elif AppellFunctionQ(op(0,expn)) then
150       max(6,apply(max,map(ExpnType,[op(expn)])))
151   elif op(0,expn)='int' then
152       max(8,apply(max,map(ExpnType,[op(expn)]))) else
153       9
154   end if
155 end proc:
156
157
158 ElementaryFunctionQ := proc(func)
159     member(func,[
160         exp,log,ln,
161         sin,cos,tan,cot,sec,csc,
162         arcsin,arccos,arctan,arccot,arcsec,arccsc,
163         sinh,cosh,tanh,coth,sech,csch,
164         arcsinh,arccosh,arctanh,arccoth,arcsech,arccsch])
165 end proc:
166
167 SpecialFunctionQ := proc(func)
168     member(func,[
169         erf,erfc,erfi,
170         FresnelS,FresnelC,
171         Ei,Ei,Li,Si,Ci,Shi,Chi,
172         GAMMA,lnGAMMA,Psi,Zeta,polylog,dilog,LambertW,
173         EllipticF,EllipticE,EllipticPi])
174 end proc:
175
176 HypergeometricFunctionQ := proc(func)
177     member(func,[Hypergeometric1F1,hypergeom,HypergeometricPFQ])
178 end proc:
179
180 AppellFunctionQ := proc(func)
181     member(func,[AppellF1])
182 end proc:
183
184 # u is a sum or product. rest(u) returns all but the
185 # first term or factor of u.
186 rest := proc(u) local v;
187     if nops(u)=2 then
188         op(2,u)
189     else
190         apply(op(0,u),op(2..nops(u),u))
191     end if
192 end proc:
193
194 #leafcount(u) returns the number of nodes in u.
195 #Nasser 3/23/17 Replaced by build-in leafCount from package in Maple

```

```

196 leafcount := proc(u)
197     MmaTranslator[Mma][LeafCount](u);
198 end proc:

```

### 4.0.3 Sympy grading function

```

1 #Dec 24, 2019. Nasser M. Abbasi:
2 #           Port of original Maple grading function by
3 #           Albert Rich to use with Sympy/Python
4 #Dec 27, 2019 Nasser. Added `RootSum`. See problem 177, Timofeev file
5 #           added 'exp_polar'
6 from sympy import *
7
8 def leaf_count(expr):
9     #sympy do not have leaf count function. This is approximation
10    return round(1.7*count_ops(expr))
11
12 def is_sqrt(expr):
13     if isinstance(expr,Pow):
14         if expr.args[1] == Rational(1,2):
15             return True
16         else:
17             return False
18     else:
19         return False
20
21 def is_elementary_function(func):
22     return func in [exp,log,ln,sin,cos,tan,cot,sec,csc,
23                    asin,acos,atan,acot,asec,acsc,sinh,cosh,tanh,coth,sech,csch,
24                    asinh,acosh,atanh,acoth,asech,acsch
25                    ]
26
27 def is_special_function(func):
28     return func in [ erf,erfc,erfi,
29                    fresnels,fresnelc,Ei,Ei,Li,Si,Ci,Shi,Chi,
30                    gamma,loggamma,digamma,zeta,polylog,LambertW,
31                    elliptic_f,elliptic_e,elliptic_pi,exp_polar
32                    ]
33
34 def is_hypergeometric_function(func):
35     return func in [hyper]
36
37 def is_appell_function(func):
38     return func in [appellf1]
39
40 def is_atom(expn):
41     try:

```



```

42     if expn.isAtom or isinstance(expn,int) or isinstance(expn,float):
43         return True
44     else:
45         return False
46
47     except AttributeError as error:
48         return False
49
50 def expnType(expn):
51     debug=False
52     if debug:
53         print("expn=",expn,"type(expn)=",type(expn))
54
55     if is_atom(expn):
56         return 1
57     elif isinstance(expn,list):
58         return max(map(expnType, expn)) #apply(max,map(ExpnType,expn))
59     elif is_sqrt(expn):
60         if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
61             return 1
62         else:
63             return max(2,expnType(expn.args[0])) #max(2,ExpnType(op(1,expn)))
64     elif isinstance(expn,Pow): #type(expn,'^^')
65         if isinstance(expn.args[1],Integer): #type(op(2,expn),'integer')
66             return expnType(expn.args[0]) #ExpnType(op(1,expn))
67         elif isinstance(expn.args[1],Rational): #type(op(2,expn),'rational')
68             if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
69                 return 1
70             else:
71                 return max(2,expnType(expn.args[0])) #max(2,ExpnType(op(1,expn)
72 ))
73     else:
74         return max(3,expnType(expn.args[0]),expnType(expn.args[1])) #max(3,
75 ExpnType(op(1,expn)),ExpnType(op(2,expn)))
76     elif isinstance(expn,Add) or isinstance(expn,Mul): #type(expn,'+' or type
77 (expn,'*')
78         m1 = expnType(expn.args[0])
79         m2 = expnType(list(expn.args[1:]))
80         return max(m1,m2) #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
81     elif is_elementary_function(expn.func): #ElementaryFunctionQ(op(0,expn))
82         return max(3,expnType(expn.args[0])) #max(3,ExpnType(op(1,expn)))
83     elif is_special_function(expn.func): #SpecialFunctionQ(op(0,expn))
84         m1 = max(map(expnType, list(expn.args)))
85         return max(4,m1) #max(4,apply(max,map(ExpnType,[op(expn)])))
86     elif is_hypergeometric_function(expn.func): #HypergeometricFunctionQ(op(0,
87 expn))
88         m1 = max(map(expnType, list(expn.args)))

```

```

85     return max(5,m1)    #max(5,apply(max,map(ExpnType,[op(expn)])))
86 elif is_appell_function(expn.func):
87     m1 = max(map(expnType, list(expn.args)))
88     return max(6,m1)    #max(5,apply(max,map(ExpnType,[op(expn)])))
89 elif isinstance(expn,RootSum):
90     m1 = max(map(expnType, list(expn.args))) #Apply[Max,Append[Map[ExpnType,
Apply[List,expn]],7]],
91     return max(7,m1)
92 elif str(expn).find("Integral") != -1:
93     m1 = max(map(expnType, list(expn.args)))
94     return max(8,m1)    #max(5,apply(max,map(ExpnType,[op(expn)])))
95 else:
96     return 9
97
98 #main function
99 def grade_antiderivative(result,optimal):
100
101     leaf_count_result  = leaf_count(result)
102     leaf_count_optimal = leaf_count(optimal)
103
104     expnType_result  = expnType(result)
105     expnType_optimal = expnType(optimal)
106
107     if str(result).find("Integral") != -1:
108         return "F"
109
110     if expnType_result <= expnType_optimal:
111         if result.has(I):
112             if optimal.has(I): #both result and optimal complex
113                 if leaf_count_result <= 2*leaf_count_optimal:
114                     return "A"
115                 else:
116                     return "B"
117             else: #result contains complex but optimal is not
118                 return "C"
119         else: # result do not contain complex, this assumes optimal do not as
well
120             if leaf_count_result <= 2*leaf_count_optimal:
121                 return "A"
122             else:
123                 return "B"
124     else:
125         return "C"

```

## 4.0.4 SageMath grading function

1 #Dec 24, 2019. Nasser: Ported original Maple grading function by

```

2 #           Albert Rich to use with Sagemath. This is used to
3 #           grade Fracas, Giac and Maxima results.
4 #Dec 24, 2019. Nasser: Added 'exp_integral_e' and 'sng', 'sin_integral'
5 #           'arctan2','floor','abs','log_integral'
6
7 from sage.all import *
8 from sage.symbolic.operators import add_vararg, mul_vararg
9
10 def tree(expr):
11     debug=False;
12     if debug:
13         print ("Enter tree(expr), expr=",expr)
14         print ("expr.operator()=",expr.operator())
15         print ("expr.operands()=",expr.operands())
16         print ("map(tree, expr.operands()=",map(tree, expr.operands()))
17
18     if expr.operator() is None:
19         return expr
20     else:
21         return [expr.operator()+list(map(tree, expr.operands()))
22
23 def leaf_count(anti):
24     debug=False;
25
26     if debug: print ("Enter leaf_count, anti=", anti, " len(anti)=", len(anti))
27
28     if len(anti) == 0: #special check for optimal being 0 for some test cases.
29         if debug: print ("len(anti) == 0")
30         return 1
31     else:
32         if debug: print ("round(1.35*len(flatten(tree(anti))))=",round(1.35*len(
33         flatten(tree(anti))))
34         return round(1.35*len(flatten(tree(anti)))) #fudge factor
35         #since this estimate of leaf count is bit lower than
36         #what it should be compared to Mathematica's
37
38 def is_sqrt(expr):
39     debug=False;
40     if expr.operator() == operator.pow: #isinstance(expr,Pow):
41         if expr.operands()[1]==1/2: #expr.args[1] == Rational(1,2):
42             if debug: print ("expr is sqrt")
43             return True
44         else:
45             return False
46     else:
47         return False

```

```

48 def is_elementary_function(func):
49     debug = False
50
51     m = func.name() in ['exp','log','ln',
52         'sin','cos','tan','cot','sec','csc',
53         'arcsin','arccos','arctan','arccot','arcsec','arccsc',
54         'sinh','cosh','tanh','coth','sech','csch',
55         'arcsinh','arccosh','arctanh','arccoth','arcsech','arccsch','sgn',
56         'arctan2','floor','abs'
57     ]
58     if debug:
59         if m:
60             print ("func ", func , " is elementary_function")
61         else:
62             print ("func ", func , " is NOT elementary_function")
63
64
65     return m
66
67 def is_special_function(func):
68     debug = False
69
70     if debug: print ("type(func)=", type(func))
71
72     m= func.name() in ['erf','erfc','erfi','fresnel_sin','fresnel_cos','Ei',
73         'Ei','Li','Si','sin_integral','Ci','cos_integral','Shi','
74     sinh_integral'
75         'Chi','cosh_integral','gamma','log_gamma','psi,zeta',
76         'polylog','lambert_w','elliptic_f','elliptic_e',
77         'elliptic_pi','exp_integral_e','log_integral']
78
79     if debug:
80         print ("m=",m)
81         if m:
82             print ("func ", func ," is special_function")
83         else:
84             print ("func ", func ," is NOT special_function")
85
86     return m
87
88
89 def is_hypergeometric_function(func):
90     return func.name() in ['hypergeometric','hypergeometric_M','hypergeometric_U
91     ']
92
93 def is_appell_function(func):

```

```

93     return func.name() in ['hypergeometric']    #[appellf1] can't find this in
          sagemath
94
95 def is_atom(expn):
96
97     #thanks to answer at https://ask.sagemath.org/question/49179/what-is-sagemath-equivalent-to-atomic-type-in-maple/
98     try:
99         if expn.parent() is SR:
100             return expn.operator() is None
101         if expn.parent() in (ZZ, QQ, AA, QQbar):
102             return expn in expn.parent() # Should always return True
103         if hasattr(expn.parent(),"base_ring") and hasattr(expn.parent(),"gens"):
104             return expn in expn.parent().base_ring() or expn in expn.parent().
          gens()
105         return False
106
107     except AttributeError as error:
108         return False
109
110
111 def expnType(expn):
112     debug=False
113
114     if debug:
115         print(">>>>Enter expnType, expn=", expn)
116         print(">>>>is_atom(expn)=", is_atom(expn))
117
118     if is_atom(expn):
119         return 1
120     elif type(expn)==list:    #isinstance(expn,list):
121         return max(map(expnType, expn))    #apply(max,map(ExpnType,expn))
122     elif is_sqrt(expn):
123         if type(expn.operands()[0])==Rational: #type(isinstance(expn.args[0],
          Rational):
124             return 1
125         else:
126             return max(2,expnType(expn.operands()[0]))    #max(2,expnType(expn.
          args[0]))
127     elif expn.operator() == operator.pow:    #isinstance(expn,Pow)
128         if type(expn.operands()[1])==Integer:    #isinstance(expn.args[1],Integer)
129             return expnType(expn.operands()[0])    #expnType(expn.args[0])
130         elif type(expn.operands()[1])==Rational:    #isinstance(expn.args[1],
          Rational)
131             if type(expn.operands()[0])==Rational: #isinstance(expn.args[0],
          Rational)
132                 return 1

```

```

133         else:
134             return max(2,expnType(expn.operands()[0])) #max(2,expnType(expn.
args[0]))
135         else:
136             return max(3,expnType(expn.operands()[0]),expnType(expn.operands()
[1])) #max(3,expnType(expn.operands()[0]),expnType(expn.operands()[1]))
137         elif expn.operator() == add_vararg or expn.operator() == mul_vararg: #
isinstance(expn,Add) or isinstance(expn,Mul)
138             m1 = expnType(expn.operands()[0]) #expnType(expn.args[0])
139             m2 = expnType(expn.operands()[1:]) #expnType(list(expn.args[1:]))
140             return max(m1,m2) #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
141         elif is_elementary_function(expn.operator()): #is_elementary_function(expn.
func)
142             return max(3,expnType(expn.operands()[0]))
143         elif is_special_function(expn.operator()): #is_special_function(expn.func)
144             m1 = max(map(expnType, expn.operands())) #max(map(expnType, list(
expn.args)))
145             return max(4,m1) #max(4,m1)
146         elif is_hypergeometric_function(expn.operator()): #
is_hypergeometric_function(expn.func)
147             m1 = max(map(expnType, expn.operands())) #max(map(expnType, list(
expn.args)))
148             return max(5,m1) #max(5,m1)
149         elif is_appell_function(expn.operator()):
150             m1 = max(map(expnType, expn.operands())) #max(map(expnType, list(
expn.args)))
151             return max(6,m1) #max(6,m1)
152         elif str(expn).find("Integral") != -1: #this will never happen, since it
153             #is checked before calling the grading function that is passed.
154             #but kept it here.
155             m1 = max(map(expnType, expn.operands())) #max(map(expnType, list(
expn.args)))
156             return max(8,m1) #max(5,apply(max,map(ExpnType,[op(expn)])))
157         else:
158             return 9
159
160 #main function
161 def grade_antiderivative(result,optimal):
162     debug = False;
163
164     if debug: print ("Enter grade_antiderivative for sagemath")
165
166     leaf_count_result = leaf_count(result)
167     leaf_count_optimal = leaf_count(optimal)
168
169     if debug: print ("leaf_count_result=", leaf_count_result, "
leaf_count_optimal=",leaf_count_optimal)

```

```
170
171
172     expnType_result = expnType(result)
173     expnType_optimal = expnType(optimal)
174
175     if debug: print ("expnType_result=", expnType_result, "expnType_optimal=",
176                     expnType_optimal)
177
178     if expnType_result <= expnType_optimal:
179         if result.has(I):
180             if optimal.has(I): #both result and optimal complex
181                 if leaf_count_result <= 2*leaf_count_optimal:
182                     return "A"
183             else:
184                 return "B"
185         else: #result contains complex but optimal is not
186             return "C"
187     else: # result do not contain complex, this assumes optimal do not as
188         well
189         if leaf_count_result <= 2*leaf_count_optimal:
190             return "A"
191         else:
192             return "B"
193     else:
194         return "C"
```