Mathematica 11.3 Integration Test Results

Test results for the 1917 problems in "1.1.1.2 (a+b x)^m (c+d x)^n.m"

Problem 73: Result more than twice size of optimal antiderivative.

$$\int \frac{(a+b x)^3}{x^5} \, dx$$

Optimal (type 1, 17 leaves, 1 step):

$$-\frac{(a+b x)^4}{4 a x^4}$$

Result (type 1, 39 leaves):

$$-\frac{a^3}{4 x^4}-\frac{a^2 b}{x^3}-\frac{3 a b^2}{2 x^2}-\frac{b^3}{x}$$

Problem 82: Result more than twice size of optimal antiderivative.

$$\int x (a+b x)^5 \, dx$$

Optimal (type 1, 30 leaves, 2 steps):

$$-\frac{a (a+b x)^6}{6 b^2}+\frac{(a+b x)^7}{7 b^2}$$

Result (type 1, 67 leaves):

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

Problem 90: Result more than twice size of optimal antiderivative.

$$\int \frac{(a+b x)^5}{x^7} \, dx$$

Optimal (type 1, 17 leaves, 1 step):

$$-\frac{(a+b x)^6}{6 a x^6}$$

Result (type 1, 65 leaves):

$$-\frac{a^5}{6 x^6}-\frac{a^4 b}{x^5}-\frac{5 a^3 b^2}{2 x^4}-\frac{10 a^2 b^3}{3 x^3}-\frac{5 a b^4}{2 x^2}-\frac{b^5}{x}$$

Problem 105: Result more than twice size of optimal antiderivative.

$$\int x\,(a+b\,x)^7\,dx$$

Optimal (type 1, 30 leaves, 2 steps):

$$-\frac{a\,(a+b\,x)^8}{8\,b^2}+\frac{(a+b\,x)^9}{9\,b^2}$$

Result (type 1, 91 leaves):

$$\frac{a^7\,x^2}{2}+\frac{7}{3}\,a^6\,b\,x^3+\frac{21}{4}\,a^5\,b^2\,x^4+7\,a^4\,b^3\,x^5+\frac{35}{6}\,a^3\,b^4\,x^6+3\,a^2\,b^5\,x^7+\frac{7}{8}\,a\,b^6\,x^8+\frac{b^7\,x^9}{9}$$

Problem 115: Result more than twice size of optimal antiderivative.

$$\int\frac{(a+b\,x)^7}{x^9}\,dx$$

Optimal (type 1, 17 leaves, 1 step):

$$-\frac{(a+b\,x)^8}{8\,a\,x^8}$$

Result (type 1, 87 leaves):

$$-\frac{a^7}{8\,x^8}-\frac{a^6\,b}{x^7}-\frac{7\,a^5\,b^2}{2\,x^6}-\frac{7\,a^4\,b^3}{x^5}-\frac{35\,a^3\,b^4}{4\,x^4}-\frac{7\,a^2\,b^5}{x^3}-\frac{7\,a\,b^6}{2\,x^2}-\frac{b^7}{x}$$

Problem 116: Result more than twice size of optimal antiderivative.

$$\int\frac{(a+b\,x)^7}{x^{10}}\,dx$$

Optimal (type 1, 36 leaves, 2 steps):

$$-\frac{(a+b\,x)^8}{9\,a\,x^9}+\frac{b\,(a+b\,x)^8}{72\,a^2\,x^8}$$

Result (type 1, 91 leaves):

$$-\frac{a^7}{9\,x^9}-\frac{7\,a^6\,b}{8\,x^8}-\frac{3\,a^5\,b^2}{x^7}-\frac{35\,a^4\,b^3}{6\,x^6}-\frac{7\,a^3\,b^4}{x^5}-\frac{21\,a^2\,b^5}{4\,x^4}-\frac{7\,a\,b^6}{3\,x^3}-\frac{b^7}{2\,x^2}$$

Problem 132: Result more than twice size of optimal antiderivative.

$$\int x^2\,(a+b\,x)^{10}\,dx$$

Optimal (type 1, 47 leaves, 2 steps):

$$\frac{a^2 (a+b x)^{11}}{11 b^3}-\frac{a (a+b x)^{12}}{6 b^3}+\frac{(a+b x)^{13}}{13 b^3}$$

Result (type 1, 126 leaves):

$$\frac{a^{10} x^3}{3}+\frac{5}{2} a^9 b x^4+9 a^8 b^2 x^5+20 a^7 b^3 x^6+30 a^6 b^4 x^7+\frac{63}{2} a^5 b^5 x^8+\frac{70}{3} a^4 b^6 x^9+12 a^3 b^7 x^{10}+\frac{45}{11} a^2 b^8 x^{11}+\frac{5}{6} a b^9 x^{12}+\frac{b^{10} x^{13}}{13}$$

Problem 133: Result more than twice size of optimal antiderivative.

$$\int x (a+b x)^{10} \, dx$$

Optimal (type 1, 30 leaves, 2 steps):

$$-\frac{a (a+b x)^{11}}{11 b^2}+\frac{(a+b x)^{12}}{12 b^2}$$

Result (type 1, 128 leaves):

$$\frac{a^{10} x^2}{2}+\frac{10}{3} a^9 b x^3+\frac{45}{4} a^8 b^2 x^4+24 a^7 b^3 x^5+35 a^6 b^4 x^6+36 a^5 b^5 x^7+\frac{105}{4} a^4 b^6 x^8+\frac{40}{3} a^3 b^7 x^9+\frac{9}{2} a^2 b^8 x^{10}+\frac{10}{11} a b^9 x^{11}+\frac{b^{10} x^{12}}{12}$$

Problem 146: Result more than twice size of optimal antiderivative.

$$\int \frac{(a+b x)^{10}}{x^{12}} \, dx$$

Optimal (type 1, 17 leaves, 1 step):

$$-\frac{(a+b x)^{11}}{11 a x^{11}}$$

Result (type 1, 114 leaves):

$$-\frac{a^{10}}{11 x^{11}}-\frac{a^9 b}{x^{10}}-\frac{5 a^8 b^2}{x^9}-\frac{15 a^7 b^3}{x^8}-\frac{30 a^6 b^4}{x^7}-\frac{42 a^5 b^5}{x^6}-\frac{42 a^4 b^6}{x^5}-\frac{30 a^3 b^7}{x^4}-\frac{15 a^2 b^8}{x^3}-\frac{5 a b^9}{x^2}-\frac{b^{10}}{x}$$

Problem 147: Result more than twice size of optimal antiderivative.

$$\int \frac{(a+b x)^{10}}{x^{13}} \, dx$$

Optimal (type 1, 36 leaves, 2 steps):

$$-\frac{(a+b x)^{11}}{12 a x^{12}}+\frac{b (a+b x)^{11}}{132 a^2 x^{11}}$$

Result (type 1, 128 leaves):

$$-\frac{a^{10}}{12 x^{12}}-\frac{10 a^9 b}{11 x^{11}}-\frac{9 a^8 b^2}{2 x^{10}}-\frac{40 a^7 b^3}{3 x^9}-\frac{105 a^6 b^4}{4 x^8}-\frac{36 a^5 b^5}{x^7}-\frac{35 a^4 b^6}{x^6}-\frac{24 a^3 b^7}{x^5}-\frac{45 a^2 b^8}{4 x^4}-\frac{10 a b^9}{3 x^3}-\frac{b^{10}}{2 x^2}$$

Problem 148: Result more than twice size of optimal antiderivative.

$$\int \frac{(a+b x)^{10}}{x^{14}} \, dx$$

Optimal (type 1, 56 leaves, 3 steps):

$$-\frac{(a+b x)^{11}}{13 a x^{13}}+\frac{b (a+b x)^{11}}{78 a^2 x^{12}}-\frac{b^2 (a+b x)^{11}}{858 a^3 x^{11}}$$

Result (type 1, 126 leaves):

$$-\frac{a^{10}}{13 x^{13}}-\frac{5 a^9 b}{6 x^{12}}-\frac{45 a^8 b^2}{11 x^{11}}-\frac{12 a^7 b^3}{x^{10}}-\frac{70 a^6 b^4}{3 x^9}-\frac{63 a^5 b^5}{2 x^8}-\frac{30 a^4 b^6}{x^7}-\frac{20 a^3 b^7}{x^6}-\frac{9 a^2 b^8}{x^5}-\frac{5 a b^9}{2 x^4}-\frac{b^{10}}{3 x^3}$$

Problem 212: Result more than twice size of optimal antiderivative.

$$\int \frac{x^5}{(a+b x)^7} \, dx$$

Optimal (type 1, 17 leaves, 1 step):

$$\frac{x^6}{6 a (a+b x)^6}$$

Result (type 1, 64 leaves):

$$-\frac{a^5+6 a^4 b x+15 a^3 b^2 x^2+20 a^2 b^3 x^3+15 a b^4 x^4+6 b^5 x^5}{6 b^6 (a+b x)^6}$$

Problem 226: Result more than twice size of optimal antiderivative.

$$\int \frac{x^8}{(a+b x)^{10}} \, dx$$

Optimal (type 1, 17 leaves, 1 step):

$$\frac{x^9}{9 a (a+b x)^9}$$

Result (type 1, 97 leaves):

$$-\frac{1}{9\,b^9\,(a+b\,x)^9}\left(a^8+9\,a^7\,b\,x+36\,a^6\,b^2\,x^2+84\,a^5\,b^3\,x^3+126\,a^4\,b^4\,x^4+126\,a^3\,b^5\,x^5+84\,a^2\,b^6\,x^6+36\,a\,b^7\,x^7+9\,b^8\,x^8\right)$$

Problem 227: Result more than twice size of optimal antiderivative.

$$\int \frac{x^7}{(a+b\,x)^{10}}\,dx$$

Optimal (type 1, 35 leaves, 2 steps):

$$\frac{x^8}{9\,a\,(a+b\,x)^9}+\frac{x^8}{72\,a^2\,(a+b\,x)^8}$$

Result (type 1, 86 leaves):

$$-\frac{1}{72\,b^8\,(a+b\,x)^9}\left(a^7+9\,a^6\,b\,x+36\,a^5\,b^2\,x^2+84\,a^4\,b^3\,x^3+126\,a^3\,b^4\,x^4+126\,a^2\,b^5\,x^5+84\,a\,b^6\,x^6+36\,b^7\,x^7\right)$$

Problem 243: Result more than twice size of optimal antiderivative.

$$\int \frac{(a+b\,x)^8}{x^{10}}\,dx$$

Optimal (type 1, 17 leaves, 1 step):

$$-\frac{(a+b\,x)^9}{9\,a\,x^9}$$

Result (type 1, 96 leaves):

$$-\frac{a^8}{9\,x^9}-\frac{a^7\,b}{x^8}-\frac{4\,a^6\,b^2}{x^7}-\frac{28\,a^5\,b^3}{3\,x^6}-\frac{14\,a^4\,b^4}{x^5}-\frac{14\,a^3\,b^5}{x^4}-\frac{28\,a^2\,b^6}{3\,x^3}-\frac{4\,a\,b^7}{x^2}-\frac{b^8}{x}$$

Problem 244: Result more than twice size of optimal antiderivative.

$$\int \frac{(a+b\,x)^7}{x^{10}}\,dx$$

Optimal (type 1, 36 leaves, 2 steps):

$$-\frac{(a+b\,x)^8}{9\,a\,x^9}+\frac{b\,(a+b\,x)^8}{72\,a^2\,x^8}$$

Result (type 1, 91 leaves):

$$-\frac{a^7}{9\,x^9}-\frac{7\,a^6\,b}{8\,x^8}-\frac{3\,a^5\,b^2}{x^7}-\frac{35\,a^4\,b^3}{6\,x^6}-\frac{7\,a^3\,b^4}{x^5}-\frac{21\,a^2\,b^5}{4\,x^4}-\frac{7\,a\,b^6}{3\,x^3}-\frac{b^7}{2\,x^2}$$

Problem 368: Result unnecessarily involves higher level functions and more

than twice size of optimal antiderivative.

$$\int \frac{x^{-1+m} \left(2 a m + b \left(-1 + 2 m\right) x\right)}{2 \left(a + b x\right)^{3/2}} \, dx$$

Optimal (type 3, 13 leaves, 2 steps):

$$\frac{x^m}{\sqrt{a + b x}}$$

Result (type 5, 100 leaves):

$$\left(x^m \sqrt{a + b x} \left(2 a \left(1 + m\right) \text{Hypergeometric2F1}\left[-\frac{1}{2}, m, 1 + m, -\frac{b x}{a}\right] - b x \left(2 m \,\text{Hypergeometric2F1}\left[\frac{1}{2}, 1 + m, 2 + m, -\frac{b x}{a}\right] + \text{Hypergeometric2F1}\left[\frac{3}{2}, 1 + m, 2 + m, -\frac{b x}{a}\right]\right)\right)\right) \Big/ \left(2 a^2 \left(1 + m\right) \sqrt{1 + \frac{b x}{a}}\right)$$

Problem 369: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \left(-\frac{b x^m}{2 \left(a + b x\right)^{3/2}} + \frac{m x^{-1+m}}{\sqrt{a + b x}}\right) dx$$

Optimal (type 3, 13 leaves, ? steps):

$$\frac{x^m}{\sqrt{a + b x}}$$

Result (type 5, 100 leaves):

$$\left(x^m \sqrt{a + b x} \left(2 a \left(1 + m\right) \text{Hypergeometric2F1}\left[-\frac{1}{2}, m, 1 + m, -\frac{b x}{a}\right] - b x \left(2 m \,\text{Hypergeometric2F1}\left[\frac{1}{2}, 1 + m, 2 + m, -\frac{b x}{a}\right] + \text{Hypergeometric2F1}\left[\frac{3}{2}, 1 + m, 2 + m, -\frac{b x}{a}\right]\right)\right)\right) \Big/ \left(2 a^2 \left(1 + m\right) \sqrt{1 + \frac{b x}{a}}\right)$$

Problem 375: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a + b x\right)^{1/3}}{x} \, dx$$

Optimal (type 3, 91 leaves, 5 steps):

$$3\,(a+b\,x)^{1/3}-\sqrt{3}\;a^{1/3}\,\text{ArcTan}\Big[\frac{a^{1/3}+2\,(a+b\,x)^{1/3}}{\sqrt{3}\;a^{1/3}}\Big]-\frac{1}{2}\,a^{1/3}\,\text{Log}[x]+\frac{3}{2}\,a^{1/3}\,\text{Log}\Big[a^{1/3}-(a+b\,x)^{1/3}\Big]$$

Result (type 5, 57 leaves):

$$\frac{6\,(a+b\,x)-3\,a\,\left(1+\frac{a}{b\,x}\right)^{2/3}\text{Hypergeometric2F1}\Big[\frac{2}{3},\frac{2}{3},\frac{5}{3},-\frac{a}{b\,x}\Big]}{2\,(a+b\,x)^{2/3}}$$

Problem 376: Result unnecessarily involves higher level functions.

$$\int\frac{(a+b\,x)^{1/3}}{x^2}\,dx$$

Optimal (type 3, 97 leaves, 5 steps):

$$-\frac{(a+b\,x)^{1/3}}{x}-\frac{b\,\text{ArcTan}\Big[\frac{a^{1/3}+2\,(a+b\,x)^{1/3}}{\sqrt{3}\;a^{1/3}}\Big]}{\sqrt{3}\;a^{2/3}}-\frac{b\,\text{Log}[x]}{6\,a^{2/3}}+\frac{b\,\text{Log}\Big[a^{1/3}-(a+b\,x)^{1/3}\Big]}{2\,a^{2/3}}$$

Result (type 5, 61 leaves):

$$\frac{-2\,(a+b\,x)-b\,\left(1+\frac{a}{b\,x}\right)^{2/3}x\,\text{Hypergeometric2F1}\Big[\frac{2}{3},\frac{2}{3},\frac{5}{3},-\frac{a}{b\,x}\Big]}{2\,x\,(a+b\,x)^{2/3}}$$

Problem 377: Result unnecessarily involves higher level functions.

$$\int\frac{(a+b\,x)^{1/3}}{x^3}\,dx$$

Optimal (type 3, 127 leaves, 6 steps):

$$-\frac{(a+b\,x)^{1/3}}{2\,x^2}-\frac{b\,(a+b\,x)^{1/3}}{6\,a\,x}+\frac{b^2\,\text{ArcTan}\Big[\frac{a^{1/3}+2\,(a+b\,x)^{1/3}}{\sqrt{3}\;a^{1/3}}\Big]}{3\,\sqrt{3}\;a^{5/3}}+\frac{b^2\,\text{Log}[x]}{18\,a^{5/3}}-\frac{b^2\,\text{Log}\Big[a^{1/3}-(a+b\,x)^{1/3}\Big]}{6\,a^{5/3}}$$

Result (type 5, 78 leaves):

$$\frac{1}{6\,a\,x^2\,(a+b\,x)^{2/3}}\left(-3\,a^2-4\,a\,b\,x-b^2\,x^2+b^2\,\left(1+\frac{a}{b\,x}\right)^{2/3}x^2\,\text{Hypergeometric2F1}\Big[\frac{2}{3},\frac{2}{3},\frac{5}{3},-\frac{a}{b\,x}\Big]\right)$$

Problem 382: Result unnecessarily involves higher level functions.

$$\int\frac{(a+b\,x)^{2/3}}{x}\,dx$$

Optimal (type 3, 92 leaves, 5 steps):

$$\frac{3}{2}\,(a+b\,x)^{2/3}+\sqrt{3}\;a^{2/3}\,\text{ArcTan}\Big[\frac{a^{1/3}+2\,(a+b\,x)^{1/3}}{\sqrt{3}\;a^{1/3}}\Big]-\frac{1}{2}\,a^{2/3}\,\text{Log}[x]+\frac{3}{2}\,a^{2/3}\,\text{Log}\Big[a^{1/3}-(a+b\,x)^{1/3}\Big]$$

Result (type 5, 57 leaves):

$$\frac{3\,(a+b\,x)-6\,a\,\left(1+\frac{a}{b\,x}\right)^{1/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},-\frac{a}{b\,x}\right]}{2\,(a+b\,x)^{1/3}}$$

Problem 383: Result unnecessarily involves higher level functions.

$$\int\frac{(a+b\,x)^{2/3}}{x^2}\,dx$$

Optimal (type 3, 94 leaves, 5 steps):

$$-\frac{(a+b\,x)^{2/3}}{x}+\frac{2\,b\,\text{ArcTan}\left[\frac{a^{1/3}+2\,(a+b\,x)^{1/3}}{\sqrt{3}\,a^{1/3}}\right]}{\sqrt{3}\,a^{1/3}}-\frac{b\,\text{Log}[x]}{3\,a^{1/3}}+\frac{b\,\text{Log}\left[a^{1/3}-(a+b\,x)^{1/3}\right]}{a^{1/3}}$$

Result (type 5, 58 leaves):

$$\frac{-a-b\,x-2\,b\,\left(1+\frac{a}{b\,x}\right)^{1/3}x\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},-\frac{a}{b\,x}\right]}{x\,(a+b\,x)^{1/3}}$$

Problem 384: Result unnecessarily involves higher level functions.

$$\int\frac{(a+b\,x)^{2/3}}{x^3}\,dx$$

Optimal (type 3, 127 leaves, 6 steps):

$$-\frac{(a+b\,x)^{2/3}}{2\,x^2}-\frac{b\,(a+b\,x)^{2/3}}{3\,a\,x}-\frac{b^2\,\text{ArcTan}\left[\frac{a^{1/3}+2\,(a+b\,x)^{1/3}}{\sqrt{3}\,a^{1/3}}\right]}{3\,\sqrt{3}\,a^{4/3}}+\frac{b^2\,\text{Log}[x]}{18\,a^{4/3}}-\frac{b^2\,\text{Log}\left[a^{1/3}-(a+b\,x)^{1/3}\right]}{6\,a^{4/3}}$$

Result (type 5, 79 leaves):

$$\frac{1}{6\,a\,x^2\,(a+b\,x)^{1/3}}\left(-3\,a^2-5\,a\,b\,x-2\,b^2\,x^2+2\,b^2\,\left(1+\frac{a}{b\,x}\right)^{1/3}x^2\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},-\frac{a}{b\,x}\right]\right)$$

Problem 389: Result unnecessarily involves higher level functions.

$$\int\frac{(a+b\,x)^{4/3}}{x}\,dx$$

Optimal (type 3, 105 leaves, 6 steps):

$$3\,a\,(a+b\,x)^{1/3}+\frac{3}{4}\,(a+b\,x)^{4/3}-\sqrt{3}\,a^{4/3}\,\text{ArcTan}\left[\frac{a^{1/3}+2\,(a+b\,x)^{1/3}}{\sqrt{3}\,a^{1/3}}\right]-$$
$$\frac{1}{2}\,a^{4/3}\,\text{Log}[x]+\frac{3}{2}\,a^{4/3}\,\text{Log}\left[a^{1/3}-(a+b\,x)^{1/3}\right]$$

Result (type 5, 74 leaves):

$$\left(\frac{15\,a}{4}+\frac{3\,b\,x}{4}\right)\,(a+b\,x)^{1/3}-\frac{3\,a^2\,\left(\frac{a+b\,x}{b\,x}\right)^{2/3}\,\text{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},-\frac{a}{b\,x}\right]}{2\,(a+b\,x)^{2/3}}$$

Problem 390: Result unnecessarily involves higher level functions.

$$\int\frac{(a+b\,x)^{4/3}}{x^2}\,dx$$

Optimal (type 3, 107 leaves, 6 steps):

$$4\,b\,(a+b\,x)^{1/3}-\frac{(a+b\,x)^{4/3}}{x}-\frac{4\,a^{1/3}\,b\,\text{ArcTan}\left[\frac{a^{1/3}+2\,(a+b\,x)^{1/3}}{\sqrt{3}\,a^{1/3}}\right]}{\sqrt{3}}-\frac{2}{3}\,a^{1/3}\,b\,\text{Log}[x]+2\,a^{1/3}\,b\,\text{Log}\left[a^{1/3}-(a+b\,x)^{1/3}\right]$$

Result (type 5, 64 leaves):

$$\frac{1}{(a+b\,x)^{2/3}}\left(\left(3\,b-\frac{a}{x}\right)\,(a+b\,x)-2\,a\,b\,\left(1+\frac{a}{b\,x}\right)^{2/3}\,\text{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},-\frac{a}{b\,x}\right]\right)$$

Problem 391: Result unnecessarily involves higher level functions.

$$\int\frac{(a+b\,x)^{4/3}}{x^3}\,dx$$

Optimal (type 3, 124 leaves, 6 steps):

$$-\frac{2\,b\,(a+b\,x)^{1/3}}{3\,x}-\frac{(a+b\,x)^{4/3}}{2\,x^2}-\frac{2\,b^2\,\text{ArcTan}\left[\frac{a^{1/3}+2\,(a+b\,x)^{1/3}}{\sqrt{3}\,a^{1/3}}\right]}{3\,\sqrt{3}\,a^{2/3}}-\frac{b^2\,\text{Log}[x]}{9\,a^{2/3}}+\frac{b^2\,\text{Log}\left[a^{1/3}-(a+b\,x)^{1/3}\right]}{3\,a^{2/3}}$$

Result (type 5, 76 leaves):

$$\frac{1}{6\,x^2\,(a+b\,x)^{2/3}}\left(-3\,a^2-10\,a\,b\,x-7\,b^2\,x^2-2\,b^2\,\left(1+\frac{a}{b\,x}\right)^{2/3}\,x^2\,\text{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},-\frac{a}{b\,x}\right]\right)$$

Problem 396: Result unnecessarily involves higher level functions.

$$\int\frac{1}{x\,(a+b\,x)^{1/3}}\,dx$$

Optimal (type 3, 79 leaves, 4 steps):

$$\frac{\sqrt{3}\,\text{ArcTan}\left[\frac{a^{1/3}+2\,(a+b\,x)^{1/3}}{\sqrt{3}\,a^{1/3}}\right]}{a^{1/3}}-\frac{\text{Log}[x]}{2\,a^{1/3}}+\frac{3\,\text{Log}\left[a^{1/3}-(a+b\,x)^{1/3}\right]}{2\,a^{1/3}}$$

Result (type 5, 46 leaves):

$$-\frac{3\left(\frac{a+b x}{b x}\right)^{1/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},-\frac{a}{b x}\right]}{(a+b x)^{1/3}}$$

Problem 397: Result unnecessarily involves higher level functions.

$$\int\frac{1}{x^2\,(a+b x)^{1/3}}\,dx$$

Optimal (type 3, 100 leaves, 5 steps):

$$-\frac{(a+b x)^{2/3}}{a x}-\frac{b\,\text{ArcTan}\left[\frac{a^{1/3}+2\,(a+b x)^{1/3}}{\sqrt{3}\,a^{1/3}}\right]}{\sqrt{3}\,a^{4/3}}+\frac{b\,\text{Log}[x]}{6\,a^{4/3}}-\frac{b\,\text{Log}\left[a^{1/3}-(a+b x)^{1/3}\right]}{2\,a^{4/3}}$$

Result (type 5, 60 leaves):

$$\frac{-a-b x+b\left(1+\frac{a}{b x}\right)^{1/3}x\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},-\frac{a}{b x}\right]}{a x\,(a+b x)^{1/3}}$$

Problem 398: Result unnecessarily involves higher level functions.

$$\int\frac{1}{x^3\,(a+b x)^{1/3}}\,dx$$

Optimal (type 3, 130 leaves, 6 steps):

$$-\frac{(a+b x)^{2/3}}{2\,a\,x^2}+\frac{2\,b\,(a+b x)^{2/3}}{3\,a^2\,x}+\frac{2\,b^2\,\text{ArcTan}\left[\frac{a^{1/3}+2\,(a+b x)^{1/3}}{\sqrt{3}\,a^{1/3}}\right]}{3\sqrt{3}\,a^{7/3}}-\frac{b^2\,\text{Log}[x]}{9\,a^{7/3}}+\frac{b^2\,\text{Log}\left[a^{1/3}-(a+b x)^{1/3}\right]}{3\,a^{7/3}}$$

Result (type 5, 78 leaves):

$$\left(-3\,a^2+a\,b\,x+4\,b^2\,x^2-4\,b^2\left(1+\frac{a}{b x}\right)^{1/3}x^2\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},-\frac{a}{b x}\right]\right)\Big/\left(6\,a^2\,x^2\,(a+b x)^{1/3}\right)$$

Problem 404: Result unnecessarily involves higher level functions.

$$\int\frac{1}{x^2\,(-a+b x)^{1/3}}\,dx$$

Optimal (type 3, 103 leaves, 5 steps):

$$\frac{(-a+b x)^{2/3}}{a x}-\frac{b\,\text{ArcTan}\left[\frac{a^{1/3}-2\,(-a+b x)^{1/3}}{\sqrt{3}\,a^{1/3}}\right]}{\sqrt{3}\,a^{4/3}}+\frac{b\,\text{Log}[x]}{6\,a^{4/3}}-\frac{b\,\text{Log}\left[a^{1/3}+(-a+b x)^{1/3}\right]}{2\,a^{4/3}}$$

Result (type 5, 62 leaves):

$$\frac{-a+b\,x-b\left(1-\frac{a}{b\,x}\right)^{1/3}x\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},\frac{a}{b\,x}\right]}{a\,x\,(-a+b\,x)^{1/3}}$$

Problem 405: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^3\,(-a+b\,x)^{1/3}}\,dx$$

Optimal (type 3, 136 leaves, 6 steps):

$$\frac{(-a+b\,x)^{2/3}}{2\,a\,x^2}+\frac{2\,b\,(-a+b\,x)^{2/3}}{3\,a^2\,x}-\frac{2\,b^2\,\text{ArcTan}\left[\frac{a^{1/3}-2\,(-a+b\,x)^{1/3}}{\sqrt{3}\,a^{1/3}}\right]}{3\,\sqrt{3}\,a^{7/3}}+\frac{b^2\,\text{Log}[x]}{9\,a^{7/3}}-\frac{b^2\,\text{Log}\left[a^{1/3}+(-a+b\,x)^{1/3}\right]}{3\,a^{7/3}}$$

Result (type 5, 81 leaves):

$$\left(-3\,a^2-a\,b\,x+4\,b^2\,x^2-4\,b^2\left(1-\frac{a}{b\,x}\right)^{1/3}x^2\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},\frac{a}{b\,x}\right]\right)\Big/\left(6\,a^2\,x^2\,(-a+b\,x)^{1/3}\right)$$

Problem 410: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x\,(a+b\,x)^{2/3}}\,dx$$

Optimal (type 3, 80 leaves, 4 steps):

$$-\frac{\sqrt{3}\,\text{ArcTan}\left[\frac{a^{1/3}+2\,(a+b\,x)^{1/3}}{\sqrt{3}\,a^{1/3}}\right]}{a^{2/3}}-\frac{\text{Log}[x]}{2\,a^{2/3}}+\frac{3\,\text{Log}\left[a^{1/3}-(a+b\,x)^{1/3}\right]}{2\,a^{2/3}}$$

Result (type 5, 48 leaves):

$$-\frac{3\left(\frac{a+b\,x}{b\,x}\right)^{2/3}\text{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},-\frac{a}{b\,x}\right]}{2\,(a+b\,x)^{2/3}}$$

Problem 411: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^2\,(a+b\,x)^{2/3}}\,dx$$

Optimal (type 3, 98 leaves, 5 steps):

$$-\frac{(a+b\,x)^{1/3}}{a\,x}+\frac{2\,b\,\text{ArcTan}\left[\frac{a^{1/3}+2\,(a+b\,x)^{1/3}}{\sqrt{3}\,a^{1/3}}\right]}{\sqrt{3}\,a^{5/3}}+\frac{b\,\text{Log}[x]}{3\,a^{5/3}}-\frac{b\,\text{Log}\left[a^{1/3}-(a+b\,x)^{1/3}\right]}{a^{5/3}}$$

Result (type 5, 60 leaves):

$$\frac{-a-b x+b\left(1+\frac{a}{b x}\right)^{2/3} x \,\text{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},-\frac{a}{b x}\right]}{a x (a+b x)^{2/3}}$$

Problem 412: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^3 (a+b x)^{2/3}} \, dx$$

Optimal (type 3, 130 leaves, 6 steps):

$$-\frac{(a+b x)^{1/3}}{2 a x^2}+\frac{5 b (a+b x)^{1/3}}{6 a^2 x}-\frac{5 b^2 \,\text{ArcTan}\left[\frac{a^{1/3}+2 (a+b x)^{1/3}}{\sqrt{3}\, a^{1/3}}\right]}{3 \sqrt{3}\, a^{8/3}}-\frac{5 b^2 \,\text{Log}[x]}{18 a^{8/3}}+\frac{5 b^2 \,\text{Log}\left[a^{1/3}-(a+b x)^{1/3}\right]}{6 a^{8/3}}$$

Result (type 5, 79 leaves):

$$\left(-3 a^2+2 a b x+5 b^2 x^2-5 b^2 \left(1+\frac{a}{b x}\right)^{2/3} x^2 \,\text{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},-\frac{a}{b x}\right]\right) \Big/ \left(6 a^2 x^2 (a+b x)^{2/3}\right)$$

Problem 417: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x (a+b x)^{4/3}} \, dx$$

Optimal (type 3, 93 leaves, 5 steps):

$$\frac{3}{a (a+b x)^{1/3}}+\frac{\sqrt{3}\,\text{ArcTan}\left[\frac{a^{1/3}+2 (a+b x)^{1/3}}{\sqrt{3}\, a^{1/3}}\right]}{a^{4/3}}-\frac{\text{Log}[x]}{2 a^{4/3}}+\frac{3 \,\text{Log}\left[a^{1/3}-(a+b x)^{1/3}\right]}{2 a^{4/3}}$$

Result (type 5, 50 leaves):

$$\frac{3-3\left(1+\frac{a}{b x}\right)^{1/3} \text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},-\frac{a}{b x}\right]}{a (a+b x)^{1/3}}$$

Problem 418: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^2 (a+b x)^{4/3}} \, dx$$

Optimal (type 3, 113 leaves, 6 steps):

$$-\frac{4\,b}{a^2\,(a+b\,x)^{1/3}}-\frac{1}{a\,x\,(a+b\,x)^{1/3}}-\frac{4\,b\,\text{ArcTan}\left[\frac{a^{1/3}+2\,(a+b\,x)^{1/3}}{\sqrt{3}\,a^{1/3}}\right]}{\sqrt{3}\,a^{7/3}}+\frac{2\,b\,\text{Log}[x]}{3\,a^{7/3}}-\frac{2\,b\,\text{Log}\left[a^{1/3}-(a+b\,x)^{1/3}\right]}{a^{7/3}}$$

Result (type 5, 61 leaves):

$$\frac{-a-4\,b\,x+4\,b\left(1+\frac{a}{b\,x}\right)^{1/3}x\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},-\frac{a}{b\,x}\right]}{a^2\,x\,(a+b\,x)^{1/3}}$$

Problem 419: Result unnecessarily involves higher level functions.

$$\int\frac{1}{x^3\,(a+b\,x)^{4/3}}\,dx$$

Optimal (type 3, 149 leaves, 7 steps):

$$\frac{14\,b^2}{3\,a^3\,(a+b\,x)^{1/3}}-\frac{1}{2\,a\,x^2\,(a+b\,x)^{1/3}}+\frac{7\,b}{6\,a^2\,x\,(a+b\,x)^{1/3}}+\frac{14\,b^2\,\text{ArcTan}\left[\frac{a^{1/3}+2\,(a+b\,x)^{1/3}}{\sqrt{3}\,a^{1/3}}\right]}{3\,\sqrt{3}\,a^{10/3}}-\frac{7\,b^2\,\text{Log}[x]}{9\,a^{10/3}}+\frac{7\,b^2\,\text{Log}\left[a^{1/3}-(a+b\,x)^{1/3}\right]}{3\,a^{10/3}}$$

Result (type 5, 79 leaves):

$$\left(-3\,a^2+7\,a\,b\,x+28\,b^2\,x^2-28\,b^2\left(1+\frac{a}{b\,x}\right)^{1/3}x^2\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},-\frac{a}{b\,x}\right]\right)\Big/\left(6\,a^3\,x^2\,(a+b\,x)^{1/3}\right)$$

Problem 648: Result more than twice size of optimal antiderivative.

$$\int\frac{1}{\sqrt{1-x}\,\sqrt{x}}\,dx$$

Optimal (type 3, 8 leaves, 3 steps):

$$-\text{ArcSin}[1-2\,x]$$

Result (type 3, 38 leaves):

$$\frac{2\,\sqrt{-1+x}\,\sqrt{x}\,\text{Log}\left[\sqrt{-1+x}+\sqrt{x}\right]}{\sqrt{-(-1+x)\,x}}$$

Problem 707: Result more than twice size of optimal antiderivative.

$$\int x^m\,(a+b\,x)^{5/2}\,dx$$

Optimal (type 5, 48 leaves, 2 steps):

$$\frac{2\,x^m\left(-\frac{b\,x}{a}\right)^{-m}(a+b\,x)^{7/2}\,\text{Hypergeometric2F1}\left[\frac{7}{2},\,-m,\,\frac{9}{2},\,1+\frac{b\,x}{a}\right]}{7\,b}$$

Result (type 5, 125 leaves):

$$\left(x^{1+m}\sqrt{a+b\,x}\left(a^2\left(6+5\,m+m^2\right)\text{Hypergeometric2F1}\left[-\frac{1}{2},\,1+m,\,2+m,\,-\frac{b\,x}{a}\right]+b\,(1+m)\,x\left(2\,a\,(3+m)\,\text{Hypergeometric2F1}\left[-\frac{1}{2},\,2+m,\,3+m,\,-\frac{b\,x}{a}\right]+b\,(2+m)\,x\,\text{Hypergeometric2F1}\left[-\frac{1}{2},\,3+m,\,4+m,\,-\frac{b\,x}{a}\right]\right)\right)\right)\Bigg/\left((1+m)\,(2+m)\,(3+m)\sqrt{1+\frac{b\,x}{a}}\right)$$

Problem 713: Result more than twice size of optimal antiderivative.

$$\int\frac{x^{2+m}}{\sqrt{a+b\,x}}\,dx$$

Optimal (type 5, 51 leaves, 2 steps):

$$\frac{2\,a^2\,x^m\left(-\frac{b\,x}{a}\right)^{-m}\sqrt{a+b\,x}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\,-2-m,\,\frac{3}{2},\,1+\frac{b\,x}{a}\right]}{b^3}$$

Result (type 5, 109 leaves):

$$\left(x^{1+m}\sqrt{a+b\,x}\left(-a\,(2+m)\,\text{Hypergeometric2F1}\left[-\frac{1}{2},\,1+m,\,2+m,\,-\frac{b\,x}{a}\right]+b\,(1+m)\,x\,\text{Hypergeometric2F1}\left[-\frac{1}{2},\,2+m,\,3+m,\,-\frac{b\,x}{a}\right]+a\,(2+m)\,\text{Hypergeometric2F1}\left[\frac{1}{2},\,1+m,\,2+m,\,-\frac{b\,x}{a}\right]\right)\right)\Bigg/\left(b^2\,(1+m)\,(2+m)\sqrt{1+\frac{b\,x}{a}}\right)$$

Problem 717: Result more than twice size of optimal antiderivative.

$$\int\frac{x^{-2+m}}{\sqrt{a+b\,x}}\,dx$$

Optimal (type 5, 49 leaves, 2 steps):

$$\frac{2\,b\,x^m\left(-\frac{b\,x}{a}\right)^{-m}\sqrt{a+b\,x}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\,2-m,\,\frac{3}{2},\,1+\frac{b\,x}{a}\right]}{a^2}$$

Result (type 5, 114 leaves):

$$\left(x^{-1+m}\sqrt{a+b\,x}\,\left(a^2\,m\,(1+m)\,\text{Hypergeometric2F1}\left[-\frac{1}{2},\,-1+m,\,m,\,-\frac{b\,x}{a}\right]-b\,(-1+m)\,x\,\left(a\,(1+m)\,\text{Hypergeometric2F1}\left[-\frac{1}{2},\,m,\,1+m,\,-\frac{b\,x}{a}\right]-b\,m\,x\,\text{Hypergeometric2F1}\left[\frac{1}{2},\,1+m,\,2+m,\,-\frac{b\,x}{a}\right]\right)\right)\right)\Big/\left(a^3\,m\,(-1+m^2)\,\sqrt{1+\frac{b\,x}{a}}\right)$$

Problem 718: Result more than twice size of optimal antiderivative.

$$\int\frac{x^{-3+m}}{\sqrt{a+b\,x}}\,dx$$

Optimal (type 5, 51 leaves, 2 steps):

$$-\frac{2\,b^2\,x^m\,\left(-\frac{b\,x}{a}\right)^{-m}\sqrt{a+b\,x}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\,3-m,\,\frac{3}{2},\,1+\frac{b\,x}{a}\right]}{a^3}$$

Result (type 5, 156 leaves):

$$\left(x^{-2+m}\sqrt{1+\frac{b\,x}{a}}\,\left(a^3\,m\,(-1+m^2)\,\text{Hypergeometric2F1}\left[-\frac{1}{2},\,-2+m,\,-1+m,\,-\frac{b\,x}{a}\right]-b\,(-2+m)\,x\,\left(a^2\,m\,(1+m)\,\text{Hypergeometric2F1}\left[-\frac{1}{2},\,-1+m,\,m,\,-\frac{b\,x}{a}\right]+b\,(-1+m)\,x\,\left(-a\,(1+m)\,\text{Hypergeometric2F1}\left[-\frac{1}{2},\,m,\,1+m,\,-\frac{b\,x}{a}\right]+b\,m\,x\,\text{Hypergeometric2F1}\left[\frac{1}{2},\,1+m,\,2+m,\,-\frac{b\,x}{a}\right]\right)\right)\right)\right)\Big/\left(a^3\,(-2+m)\,(-1+m)\,m\,(1+m)\,\sqrt{a+b\,x}\right)$$

Problem 1162: Result more than twice size of optimal antiderivative.

$$\int\frac{1}{\sqrt{3-x}\,\sqrt{-2+x}}\,dx$$

Optimal (type 3, 8 leaves, 3 steps):

$$-\text{ArcSin}[5-2\,x]$$

Result (type 3, 36 leaves):

$$\frac{2\,\sqrt{-3+x}\,\sqrt{-2+x}\,\text{ArcSinh}\left[\sqrt{-3+x}\right]}{\sqrt{-(-3+x)\,(-2+x)}}$$

Problem 1170: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(6-3\,e\,x)^{1/4}\,(2+e\,x)^{3/4}}\,dx$$

Optimal (type 3, 241 leaves, 11 steps):

$$\frac{\sqrt{2}\,\text{ArcTan}\left[1-\frac{\sqrt{2}\,(2-e\,x)^{1/4}}{(2+e\,x)^{1/4}}\right]}{3^{1/4}\,e}-\frac{\sqrt{2}\,\text{ArcTan}\left[1+\frac{\sqrt{2}\,(2-e\,x)^{1/4}}{(2+e\,x)^{1/4}}\right]}{3^{1/4}\,e}-\frac{\text{Log}\left[\frac{\sqrt{6-3\,e\,x}-\sqrt{6}\,(2-e\,x)^{1/4}\,(2+e\,x)^{1/4}+\sqrt{3}\,\sqrt{2+e\,x}}{\sqrt{2+e\,x}}\right]}{\sqrt{2}\,3^{1/4}\,e}+\frac{\text{Log}\left[\frac{\sqrt{6-3\,e\,x}+\sqrt{6}\,(2-e\,x)^{1/4}\,(2+e\,x)^{1/4}+\sqrt{3}\,\sqrt{2+e\,x}}{\sqrt{2+e\,x}}\right]}{\sqrt{2}\,3^{1/4}\,e}$$

Result (type 5, 43 leaves):

$$\frac{2\,\sqrt{2}\,(2+e\,x)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},\frac{1}{4}\,(2+e\,x)\right]}{3^{1/4}\,e}$$

Problem 1171: Result unnecessarily involves higher level functions.

$$\int \frac{(a-i\,a\,x)^{7/4}}{(a+i\,a\,x)^{1/4}}\,dx$$

Optimal (type 4, 144 leaves, 6 steps):

$$\frac{14\,a^2\,x}{5\,(a-i\,a\,x)^{1/4}\,(a+i\,a\,x)^{1/4}}-\frac{14}{15}\,i\,(a-i\,a\,x)^{3/4}\,(a+i\,a\,x)^{3/4}-\frac{2\,i\,(a-i\,a\,x)^{7/4}\,(a+i\,a\,x)^{3/4}}{5\,a}-\frac{14\,a^2\,(1+x^2)^{1/4}\,\text{EllipticE}\left[\frac{\text{ArcTan}[x]}{2},2\right]}{5\,(a-i\,a\,x)^{1/4}\,(a+i\,a\,x)^{1/4}}$$

Result (type 5, 84 leaves):

$$\frac{1}{15\,(a+i\,a\,x)^{1/4}}2\,a\,(a-i\,a\,x)^{3/4}\left(-10\,i+7\,x-3\,i\,x^2+7\,i\,2^{3/4}\,(1+i\,x)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{1}{2}-\frac{i\,x}{2}\right]\right)$$

Problem 1172: Result unnecessarily involves higher level functions.

$$\int \frac{(a-i\,a\,x)^{3/4}}{(a+i\,a\,x)^{1/4}}\,dx$$

Optimal (type 4, 106 leaves, 5 steps):

$$\frac{2\,a\,x}{(a-i\,a\,x)^{1/4}\,(a+i\,a\,x)^{1/4}}-\frac{2\,i\,(a-i\,a\,x)^{3/4}\,(a+i\,a\,x)^{3/4}}{3\,a}-\frac{2\,a\,(1+x^2)^{1/4}\,\text{EllipticE}\left[\frac{\text{ArcTan}[x]}{2},2\right]}{(a-i\,a\,x)^{1/4}\,(a+i\,a\,x)^{1/4}}$$

Result (type 5, 74 leaves):

$$\frac{1}{3\,(a+\mathrm{i}\,a\,x)^{1/4}}2\,(a-\mathrm{i}\,a\,x)^{3/4}\left(-\mathrm{i}+x+\mathrm{i}\,2^{3/4}\,(1+\mathrm{i}\,x)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{1}{2}-\frac{\mathrm{i}\,x}{2}\right]\right)$$

Problem 1173: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(a-\mathrm{i}\,a\,x)^{1/4}\,(a+\mathrm{i}\,a\,x)^{1/4}}\,dx$$

Optimal (type 4, 71 leaves, 4 steps):

$$\frac{2\,x}{(a-\mathrm{i}\,a\,x)^{1/4}\,(a+\mathrm{i}\,a\,x)^{1/4}}-\frac{2\,(1+x^2)^{1/4}\,\text{EllipticE}\left[\frac{\text{ArcTan}[x]}{2},2\right]}{(a-\mathrm{i}\,a\,x)^{1/4}\,(a+\mathrm{i}\,a\,x)^{1/4}}$$

Result (type 5, 70 leaves):

$$\frac{2\,\mathrm{i}\,2^{3/4}\,(1+\mathrm{i}\,x)^{1/4}\,(a-\mathrm{i}\,a\,x)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{1}{2}-\frac{\mathrm{i}\,x}{2}\right]}{3\,a\,(a+\mathrm{i}\,a\,x)^{1/4}}$$

Problem 1174: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(a-\mathrm{i}\,a\,x)^{5/4}\,(a+\mathrm{i}\,a\,x)^{1/4}}\,dx$$

Optimal (type 4, 78 leaves, 4 steps):

$$-\frac{2\,\mathrm{i}}{a\,(a-\mathrm{i}\,a\,x)^{1/4}\,(a+\mathrm{i}\,a\,x)^{1/4}}+\frac{2\,(1+x^2)^{1/4}\,\text{EllipticE}\left[\frac{\text{ArcTan}[x]}{2},2\right]}{a\,(a-\mathrm{i}\,a\,x)^{1/4}\,(a+\mathrm{i}\,a\,x)^{1/4}}$$

Result (type 5, 82 leaves):

$$\left(-6\,\mathrm{i}+6\,x-2\times 2^{3/4}\,(1+\mathrm{i}\,x)^{1/4}\,(\mathrm{i}+x)\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{1}{2}-\frac{\mathrm{i}\,x}{2}\right]\right)\Big/\left(3\,a\,(a-\mathrm{i}\,a\,x)^{1/4}\,(a+\mathrm{i}\,a\,x)^{1/4}\right)$$

Problem 1175: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(a-\mathrm{i}\,a\,x)^{9/4}\,(a+\mathrm{i}\,a\,x)^{1/4}}\,dx$$

Optimal (type 4, 82 leaves, 4 steps):

$$-\frac{4\,\mathrm{i}}{5\,a\,(a-\mathrm{i}\,a\,x)^{5/4}\,(a+\mathrm{i}\,a\,x)^{1/4}}+\frac{2\,(1+x^2)^{1/4}\,\text{EllipticE}\left[\frac{\text{ArcTan}[x]}{2},2\right]}{5\,a^2\,(a-\mathrm{i}\,a\,x)^{1/4}\,(a+\mathrm{i}\,a\,x)^{1/4}}$$

Result (type 5, 97 leaves):

$$\left(6\left(2+i x+x^2\right)-2\times 2^{3/4}(1+i x)^{1/4}(i+x)^2 \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{1}{2}-\frac{i x}{2}\right]\right)\Big/\left(15 a^2 (i+x)(a-i a x)^{1/4}(a+i a x)^{1/4}\right)$$

Problem 1176: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a-i a x)^{13/4}(a+i a x)^{1/4}}\,dx$$

Optimal (type 4, 115 leaves, 5 steps):

$$-\frac{4 i}{15 a^2 (a-i a x)^{5/4}(a+i a x)^{1/4}}-\frac{2 i (a+i a x)^{3/4}}{9 a^2 (a-i a x)^{9/4}}+\frac{2\left(1+x^2\right)^{1/4} \text{EllipticE}\left[\frac{\text{ArcTan}[x]}{2},2\right]}{15 a^3 (a-i a x)^{1/4}(a+i a x)^{1/4}}$$

Result (type 5, 103 leaves):

$$\left(22 i-4 x+12 i x^2+6 x^3-2\times 2^{3/4}(1+i x)^{1/4}(i+x)^3 \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{1}{2}-\frac{i x}{2}\right]\right)\Big/\left(45 a^3 (i+x)^2 (a-i a x)^{1/4}(a+i a x)^{1/4}\right)$$

Problem 1177: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a-i a x)^{17/4}(a+i a x)^{1/4}}\,dx$$

Optimal (type 4, 148 leaves, 6 steps):

$$-\frac{4 i}{39 a^3 (a-i a x)^{5/4}(a+i a x)^{1/4}}-\frac{2 i (a+i a x)^{3/4}}{13 a^2 (a-i a x)^{13/4}}-\frac{10 i (a+i a x)^{3/4}}{117 a^3 (a-i a x)^{9/4}}+\frac{2\left(1+x^2\right)^{1/4} \text{EllipticE}\left[\frac{\text{ArcTan}[x]}{2},2\right]}{39 a^4 (a-i a x)^{1/4}(a+i a x)^{1/4}}$$

Result (type 5, 102 leaves):

$$-\left(\left(2\left(20+8 x^2-9 i x^3-3 x^4+2^{3/4}(1+i x)^{1/4}(i+x)^4 \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{1}{2}-\frac{i x}{2}\right]\right)\right)\Big/\left(117 a^4 (i+x)^3 (a-i a x)^{1/4}(a+i a x)^{1/4}\right)\right)$$

Problem 1178: Result unnecessarily involves higher level functions.

$$\int \frac{(a-i a x)^{1/4}}{(a+i a x)^{1/4}}\,dx$$

Optimal (type 3, 256 leaves, 12 steps):

$$-\frac{i (a-i a x)^{1/4} (a+i a x)^{3/4}}{a}-\frac{i \text{ArcTan}\left[1-\frac{\sqrt{2} (a-i a x)^{1/4}}{(a+i a x)^{1/4}}\right]}{\sqrt{2}}+\frac{i \text{ArcTan}\left[1+\frac{\sqrt{2} (a-i a x)^{1/4}}{(a+i a x)^{1/4}}\right]}{\sqrt{2}}-\frac{i \text{Log}\left[1+\frac{\sqrt{a-i a x}}{\sqrt{a+i a x}}-\frac{\sqrt{2} (a-i a x)^{1/4}}{(a+i a x)^{1/4}}\right]}{2 \sqrt{2}}+\frac{i \text{Log}\left[1+\frac{\sqrt{a-i a x}}{\sqrt{a+i a x}}+\frac{\sqrt{2} (a-i a x)^{1/4}}{(a+i a x)^{1/4}}\right]}{2 \sqrt{2}}$$

Result (type 5, 71 leaves) :

$$\frac{1}{(a+i a x)^{1/4}} (a-i a x)^{1/4} \left(-i+x+i\, 2^{3/4} (1+i x)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},\frac{1}{2}-\frac{i x}{2}\right]\right)$$

Problem 1179: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a-i a x)^{3/4} (a+i a x)^{1/4}} \, dx$$

Optimal (type 3, 233 leaves, 11 steps) :

$$-\frac{i \sqrt{2} \text{ArcTan}\left[1-\frac{\sqrt{2} (a-i a x)^{1/4}}{(a+i a x)^{1/4}}\right]}{a}+\frac{i \sqrt{2} \text{ArcTan}\left[1+\frac{\sqrt{2} (a-i a x)^{1/4}}{(a+i a x)^{1/4}}\right]}{a}-\frac{i \text{Log}\left[1+\frac{\sqrt{a-i a x}}{\sqrt{a+i a x}}-\frac{\sqrt{2} (a-i a x)^{1/4}}{(a+i a x)^{1/4}}\right]}{\sqrt{2} a}+\frac{i \text{Log}\left[1+\frac{\sqrt{a-i a x}}{\sqrt{a+i a x}}+\frac{\sqrt{2} (a-i a x)^{1/4}}{(a+i a x)^{1/4}}\right]}{\sqrt{2} a}$$

Result (type 5, 68 leaves) :

$$\frac{2 i\, 2^{3/4} (1+i x)^{1/4} (a-i a x)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},\frac{1}{2}-\frac{i x}{2}\right]}{a (a+i a x)^{1/4}}$$

Problem 1184: Result unnecessarily involves higher level functions.

$$\int \frac{(a-i a x)^{3/4}}{(a+i a x)^{3/4}} \, dx$$

Optimal (type 3, 256 leaves, 12 steps) :

$$-\frac{i (a-i a x)^{3/4} (a+i a x)^{1/4}}{a}-\frac{3 i \text{ArcTan}\left[1-\frac{\sqrt{2} (a-i a x)^{1/4}}{(a+i a x)^{1/4}}\right]}{\sqrt{2}}+\frac{3 i \text{ArcTan}\left[1+\frac{\sqrt{2} (a-i a x)^{1/4}}{(a+i a x)^{1/4}}\right]}{\sqrt{2}}+\frac{3 i \text{Log}\left[1+\frac{\sqrt{a-i a x}}{\sqrt{a+i a x}}-\frac{\sqrt{2} (a-i a x)^{1/4}}{(a+i a x)^{1/4}}\right]}{2 \sqrt{2}}-\frac{3 i \text{Log}\left[1+\frac{\sqrt{a-i a x}}{\sqrt{a+i a x}}+\frac{\sqrt{2} (a-i a x)^{1/4}}{(a+i a x)^{1/4}}\right]}{2 \sqrt{2}}$$

Result (type 5, 71 leaves) :

$$\frac{1}{(a+i a x)^{3/4}} (a-i a x)^{3/4} \left(-i+x+i\, 2^{1/4} (1+i x)^{3/4} \text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\frac{1}{2}-\frac{i x}{2}\right]\right)$$

Problem 1185: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a - i a x)^{1/4} (a + i a x)^{3/4}} \, dx$$

Optimal (type 3, 233 leaves, 11 steps):

$$-\frac{i \sqrt{2} \text{ArcTan}\left[1 - \frac{\sqrt{2} (a-i a x)^{1/4}}{(a+i a x)^{1/4}}\right]}{a} + \frac{i \sqrt{2} \text{ArcTan}\left[1 + \frac{\sqrt{2} (a-i a x)^{1/4}}{(a+i a x)^{1/4}}\right]}{a} + \frac{i \text{Log}\left[1 + \frac{\sqrt{a-i a x}}{\sqrt{a+i a x}} - \frac{\sqrt{2} (a-i a x)^{1/4}}{(a+i a x)^{1/4}}\right]}{\sqrt{2} a} - \frac{i \text{Log}\left[1 + \frac{\sqrt{a-i a x}}{\sqrt{a+i a x}} + \frac{\sqrt{2} (a-i a x)^{1/4}}{(a+i a x)^{1/4}}\right]}{\sqrt{2} a}$$

Result (type 5, 70 leaves):

$$\frac{2 i 2^{1/4} (1 + i x)^{3/4} (a - i a x)^{3/4} \text{Hypergeometric2F1}\left[\frac{3}{4}, \frac{3}{4}, \frac{7}{4}, \frac{1}{2} - \frac{i x}{2}\right]}{3 a (a + i a x)^{3/4}}$$

Problem 1189: Result unnecessarily involves higher level functions.

$$\int \frac{(a - i a x)^{5/4}}{(a + i a x)^{3/4}} \, dx$$

Optimal (type 4, 112 leaves, 5 steps):

$$-\frac{10}{3} i (a - i a x)^{1/4} (a + i a x)^{1/4} - \frac{2 i (a - i a x)^{5/4} (a + i a x)^{1/4}}{3 a} + \frac{10 a^2 (1 + x^2)^{3/4} \text{EllipticF}\left[\frac{\text{ArcTan}[x]}{2}, 2\right]}{3 (a - i a x)^{3/4} (a + i a x)^{3/4}}$$

Result (type 5, 80 leaves):

$$-\frac{1}{3 (a + i a x)^{3/4}} 2 i a (a - i a x)^{1/4} \left(6 + 5 i x + x^2 - 5 \times 2^{1/4} (1 + i x)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{3}{4}, \frac{5}{4}, \frac{1}{2} - \frac{i x}{2}\right]\right)$$

Problem 1190: Result unnecessarily involves higher level functions.

$$\int \frac{(a - i a x)^{1/4}}{(a + i a x)^{3/4}} \, dx$$

Optimal (type 4, 76 leaves, 4 steps):

$$-\frac{2 i (a - i a x)^{1/4} (a + i a x)^{1/4}}{a} + \frac{2 a (1 + x^2)^{3/4} \text{EllipticF}\left[\frac{\text{ArcTan}[x]}{2}, 2\right]}{(a - i a x)^{3/4} (a + i a x)^{3/4}}$$

Result (type 5, 72 leaves):

$$\frac{1}{(a+i a x)^{3/4}} 2 (a-i a x)^{1/4} \left(-i+x+i\, 2^{1/4} (1+i x)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{1}{2}-\frac{i x}{2}\right]\right)$$

Problem 1191: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a-i a x)^{3/4} (a+i a x)^{3/4}} \, dx$$

Optimal (type 4, 43 leaves, 3 steps):

$$\frac{2 \left(1+x^2\right)^{3/4} \text{EllipticF}\left[\frac{\text{ArcTan}[x]}{2},2\right]}{(a-i a x)^{3/4} (a+i a x)^{3/4}}$$

Result (type 5, 68 leaves):

$$\frac{2 i\, 2^{1/4} (1+i x)^{3/4} (a-i a x)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{1}{2}-\frac{i x}{2}\right]}{a (a+i a x)^{3/4}}$$

Problem 1192: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a-i a x)^{7/4} (a+i a x)^{3/4}} \, dx$$

Optimal (type 4, 82 leaves, 4 steps):

$$-\frac{2 i (a+i a x)^{1/4}}{3 a^2 (a-i a x)^{3/4}}+\frac{2 \left(1+x^2\right)^{3/4} \text{EllipticF}\left[\frac{\text{ArcTan}[x]}{2},2\right]}{3 a (a-i a x)^{3/4} (a+i a x)^{3/4}}$$

Result (type 5, 79 leaves):

$$\left(2 \left(-i+x+2^{1/4} (1+i x)^{3/4} (i+x) \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{1}{2}-\frac{i x}{2}\right]\right)\right) \Big/ \left(3 a (a-i a x)^{3/4} (a+i a x)^{3/4}\right)$$

Problem 1193: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a-i a x)^{11/4} (a+i a x)^{3/4}} \, dx$$

Optimal (type 4, 115 leaves, 5 steps):

$$-\frac{2 i (a+i a x)^{1/4}}{7 a^2 (a-i a x)^{7/4}}-\frac{2 i (a+i a x)^{1/4}}{7 a^3 (a-i a x)^{3/4}}+\frac{2 \left(1+x^2\right)^{3/4} \text{EllipticF}\left[\frac{\text{ArcTan}[x]}{2},2\right]}{7 a^2 (a-i a x)^{3/4} (a+i a x)^{3/4}}$$

Result (type 5, 93 leaves):

$$\left(2 \left(2 + i x + x^2 + 2^{1/4} (1 + i x)^{3/4} (i + x)^2 \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{3}{4}, \frac{5}{4}, \frac{1}{2} - \frac{i x}{2}\right]\right)\right) \Big/ \left(7 a^2 (i + x) (a - i a x)^{3/4} (a + i a x)^{3/4}\right)$$

Problem 1194: Result unnecessarily involves higher level functions.

$$\int \frac{(a - i a x)^{7/4}}{(a + i a x)^{7/4}} \, dx$$

Optimal (type 3, 291 leaves, 13 steps):

$$\frac{4 i (a - i a x)^{7/4}}{3 a (a + i a x)^{3/4}} + \frac{7 i (a - i a x)^{3/4} (a + i a x)^{1/4}}{3 a} + \frac{7 i \text{ArcTan}\left[1 - \frac{\sqrt{2} (a-i a x)^{1/4}}{(a+i a x)^{1/4}}\right]}{\sqrt{2}} - \frac{7 i \text{ArcTan}\left[1 + \frac{\sqrt{2} (a-i a x)^{1/4}}{(a+i a x)^{1/4}}\right]}{\sqrt{2}} - \frac{7 i \text{Log}\left[1 + \frac{\sqrt{a-i a x}}{\sqrt{a+i a x}} - \frac{\sqrt{2} (a-i a x)^{1/4}}{(a+i a x)^{1/4}}\right]}{2 \sqrt{2}} + \frac{7 i \text{Log}\left[1 + \frac{\sqrt{a-i a x}}{\sqrt{a+i a x}} + \frac{\sqrt{2} (a-i a x)^{1/4}}{(a+i a x)^{1/4}}\right]}{2 \sqrt{2}}$$

Result (type 5, 76 leaves):

$$\frac{1}{3 (a + i a x)^{3/4}} (a - i a x)^{3/4} \left(11 i - 3 x - 7 i 2^{1/4} (1 + i x)^{3/4} \text{Hypergeometric2F1}\left[\frac{3}{4}, \frac{3}{4}, \frac{7}{4}, \frac{1}{2} - \frac{i x}{2}\right]\right)$$

Problem 1195: Result unnecessarily involves higher level functions.

$$\int \frac{(a - i a x)^{3/4}}{(a + i a x)^{7/4}} \, dx$$

Optimal (type 3, 266 leaves, 12 steps):

$$\frac{4 i (a - i a x)^{3/4}}{3 a (a + i a x)^{3/4}} + \frac{i \sqrt{2} \text{ArcTan}\left[1 - \frac{\sqrt{2} (a-i a x)^{1/4}}{(a+i a x)^{1/4}}\right]}{a} - \frac{i \sqrt{2} \text{ArcTan}\left[1 + \frac{\sqrt{2} (a-i a x)^{1/4}}{(a+i a x)^{1/4}}\right]}{a} - \frac{i \text{Log}\left[1 + \frac{\sqrt{a-i a x}}{\sqrt{a+i a x}} - \frac{\sqrt{2} (a-i a x)^{1/4}}{(a+i a x)^{1/4}}\right]}{\sqrt{2} a} + \frac{i \text{Log}\left[1 + \frac{\sqrt{a-i a x}}{\sqrt{a+i a x}} + \frac{\sqrt{2} (a-i a x)^{1/4}}{(a+i a x)^{1/4}}\right]}{\sqrt{2} a}$$

Result (type 5, 73 leaves):

$$-\frac{1}{3 a (a + i a x)^{3/4}} 2 i (a - i a x)^{3/4} \left(-2 + 2^{1/4} (1 + i x)^{3/4} \text{Hypergeometric2F1}\left[\frac{3}{4}, \frac{3}{4}, \frac{7}{4}, \frac{1}{2} - \frac{i x}{2}\right]\right)$$

Problem 1199: Result unnecessarily involves higher level functions.

$$\int \frac{(a-i a x)^{9/4}}{(a+i a x)^{7/4}} \, dx$$

Optimal (type 4, 139 leaves, 6 steps):

$$\frac{4 i (a-i a x)^{9/4}}{3 a (a+i a x)^{3/4}}+10 i (a-i a x)^{1/4} (a+i a x)^{1/4}+\frac{2 i (a-i a x)^{5/4} (a+i a x)^{1/4}}{a}-\frac{10 a^2 \left(1+x^2\right)^{3/4} \text{EllipticF}\left[\frac{\text{ArcTan}[x]}{2},2\right]}{(a-i a x)^{3/4} (a+i a x)^{3/4}}$$

Result (type 5, 80 leaves):

$$\frac{1}{3 (a+i a x)^{3/4}} 2 i a (a-i a x)^{1/4} \left(20+11 i x+x^2-15\times 2^{1/4} (1+i x)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{1}{2}-\frac{i x}{2}\right]\right)$$

Problem 1200: Result unnecessarily involves higher level functions.

$$\int \frac{(a-i a x)^{5/4}}{(a+i a x)^{7/4}} \, dx$$

Optimal (type 4, 113 leaves, 5 steps):

$$\frac{4 i (a-i a x)^{5/4}}{3 a (a+i a x)^{3/4}}+\frac{10 i (a-i a x)^{1/4} (a+i a x)^{1/4}}{3 a}-\frac{10 a \left(1+x^2\right)^{3/4} \text{EllipticF}\left[\frac{\text{ArcTan}[x]}{2},2\right]}{3 (a-i a x)^{3/4} (a+i a x)^{3/4}}$$

Result (type 5, 76 leaves):

$$-\frac{1}{3 (a+i a x)^{3/4}} 2 (a-i a x)^{1/4} \left(-7 i+3 x+5 i 2^{1/4} (1+i x)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{1}{2}-\frac{i x}{2}\right]\right)$$

Problem 1201: Result unnecessarily involves higher level functions.

$$\int \frac{(a-i a x)^{1/4}}{(a+i a x)^{7/4}} \, dx$$

Optimal (type 4, 79 leaves, 4 steps):

$$\frac{4 i (a-i a x)^{1/4}}{3 a (a+i a x)^{3/4}}-\frac{2 \left(1+x^2\right)^{3/4} \text{EllipticF}\left[\frac{\text{ArcTan}[x]}{2},2\right]}{3 (a-i a x)^{3/4} (a+i a x)^{3/4}}$$

Result (type 5, 73 leaves):

$$-\frac{1}{3\,a\,(a+i\,a\,x)^{3/4}}2\,i\,(a-i\,a\,x)^{1/4}\left(-2+2^{1/4}\,(1+i\,x)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{1}{2}-\frac{i\,x}{2}\right]\right)$$

Problem 1202: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(a-i\,a\,x)^{3/4}\,(a+i\,a\,x)^{7/4}}\,dx$$

Optimal (type 4, 82 leaves, 4 steps):

$$\frac{2\,i\,(a-i\,a\,x)^{1/4}}{3\,a^2\,(a+i\,a\,x)^{3/4}}+\frac{2\,(1+x^2)^{3/4}\,\text{EllipticF}\left[\frac{\text{ArcTan}[x]}{2},2\right]}{3\,a\,(a-i\,a\,x)^{3/4}\,(a+i\,a\,x)^{3/4}}$$

Result (type 5, 73 leaves):

$$\frac{1}{3\,a^2\,(a+i\,a\,x)^{3/4}}2\,i\,(a-i\,a\,x)^{1/4}\left(1+2^{1/4}\,(1+i\,x)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{1}{2}-\frac{i\,x}{2}\right]\right)$$

Problem 1203: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(a-i\,a\,x)^{7/4}\,(a+i\,a\,x)^{7/4}}\,dx$$

Optimal (type 4, 81 leaves, 4 steps):

$$\frac{2\,x}{3\,a^2\,(a-i\,a\,x)^{3/4}\,(a+i\,a\,x)^{3/4}}+\frac{2\,(1+x^2)^{3/4}\,\text{EllipticF}\left[\frac{\text{ArcTan}[x]}{2},2\right]}{3\,a^2\,(a-i\,a\,x)^{3/4}\,(a+i\,a\,x)^{3/4}}$$

Result (type 5, 76 leaves):

$$\frac{2\left(x+2^{1/4}\,(1+i\,x)^{3/4}\,(i+x)\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{1}{2}-\frac{i\,x}{2}\right]\right)}{3\,a^2\,(a-i\,a\,x)^{3/4}\,(a+i\,a\,x)^{3/4}}$$

Problem 1204: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(a-i\,a\,x)^{11/4}\,(a+i\,a\,x)^{7/4}}\,dx$$

Optimal (type 4, 114 leaves, 5 steps):

$$-\frac{2\,i}{7\,a^2\,(a-i\,a\,x)^{7/4}\,(a+i\,a\,x)^{3/4}}+\frac{10\,x}{21\,a^3\,(a-i\,a\,x)^{3/4}\,(a+i\,a\,x)^{3/4}}+\frac{10\,(1+x^2)^{3/4}\,\text{EllipticF}\left[\frac{\text{ArcTan}[x]}{2},2\right]}{21\,a^3\,(a-i\,a\,x)^{3/4}\,(a+i\,a\,x)^{3/4}}$$

Result (type 5, 96 leaves):

$$\left(2\left(3+5\,i\,x+5\,x^2+5\times 2^{1/4}\,(1+i\,x)^{3/4}\,(i+x)^2\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{1}{2}-\frac{i\,x}{2}\right]\right)\right)\Big/\left(21\,a^3\,(i+x)\,(a-i\,a\,x)^{3/4}\,(a+i\,a\,x)^{3/4}\right)$$

Problem 1205: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a-i\,a\,x)^{15/4}\,(a+i\,a\,x)^{7/4}}\,dx$$

Optimal (type 4, 147 leaves, 6 steps):

$$-\frac{2\,i}{11\,a^2\,(a-i\,a\,x)^{11/4}\,(a+i\,a\,x)^{3/4}}-\frac{2\,i}{11\,a^3\,(a-i\,a\,x)^{7/4}\,(a+i\,a\,x)^{3/4}}+\frac{10\,x}{33\,a^4\,(a-i\,a\,x)^{3/4}\,(a+i\,a\,x)^{3/4}}+\frac{10\,(1+x^2)^{3/4}\,\text{EllipticF}\left[\frac{\text{ArcTan}[x]}{2},2\right]}{33\,a^4\,(a-i\,a\,x)^{3/4}\,(a+i\,a\,x)^{3/4}}$$

Result (type 5, 103 leaves):

$$\left(2\left(6\,i-2\,x+10\,i\,x^2+5\,x^3+5\times 2^{1/4}\,(1+i\,x)^{3/4}\,(i+x)^3\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{1}{2}-\frac{i\,x}{2}\right]\right)\right)\Big/\left(33\,a^4\,(i+x)^2\,(a-i\,a\,x)^{3/4}\,(a+i\,a\,x)^{3/4}\right)$$

Problem 1206: Result unnecessarily involves higher level functions.

$$\int \frac{(a-i\,a\,x)^{7/4}}{(a+i\,a\,x)^{5/4}}\,dx$$

Optimal (type 4, 137 leaves, 6 steps):

$$-\frac{14\,a\,x}{(a-i\,a\,x)^{1/4}\,(a+i\,a\,x)^{1/4}}+\frac{4\,i\,(a-i\,a\,x)^{7/4}}{a\,(a+i\,a\,x)^{1/4}}+\frac{14\,i\,(a-i\,a\,x)^{3/4}\,(a+i\,a\,x)^{3/4}}{3\,a}+\frac{14\,a\,(1+x^2)^{1/4}\,\text{EllipticE}\left[\frac{\text{ArcTan}[x]}{2},2\right]}{(a-i\,a\,x)^{1/4}\,(a+i\,a\,x)^{1/4}}$$

Result (type 5, 74 leaves):

$$-\frac{1}{3\,(a+i\,a\,x)^{1/4}}\,2\,(a-i\,a\,x)^{3/4}\left(-13\,i+x+7\,i\,2^{3/4}\,(1+i\,x)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{1}{2}-\frac{i\,x}{2}\right]\right)$$

Problem 1207: Result unnecessarily involves higher level functions.

$$\int \frac{(a-i\,a\,x)^{3/4}}{(a+i\,a\,x)^{5/4}}\,dx$$

Optimal (type 4, 102 leaves, 5 steps):

$$-\frac{6\,x}{(a-i\,a\,x)^{1/4}\,(a+i\,a\,x)^{1/4}}+\frac{4\,i\,(a-i\,a\,x)^{3/4}}{a\,(a+i\,a\,x)^{1/4}}+\frac{6\,(1+x^2)^{1/4}\,\text{EllipticE}\left[\frac{\text{ArcTan}[x]}{2},2\right]}{(a-i\,a\,x)^{1/4}\,(a+i\,a\,x)^{1/4}}$$

Result (type 5, 71 leaves):

$$-\frac{1}{a\,(a+i\,a\,x)^{1/4}}2\,i\,(a-i\,a\,x)^{3/4}\left(-2+2^{3/4}\,(1+i\,x)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{1}{2}-\frac{i\,x}{2}\right]\right)$$

Problem 1208: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(a-i\,a\,x)^{1/4}\,(a+i\,a\,x)^{5/4}}\,dx$$

Optimal (type 4, 78 leaves, 4 steps):

$$\frac{2\,i}{a\,(a-i\,a\,x)^{1/4}\,(a+i\,a\,x)^{1/4}}+\frac{2\,(1+x^2)^{1/4}\,\text{EllipticE}\left[\frac{\text{ArcTan}[x]}{2},2\right]}{a\,(a-i\,a\,x)^{1/4}\,(a+i\,a\,x)^{1/4}}$$

Result (type 5, 73 leaves):

$$-\frac{1}{3\,a^2\,(a+i\,a\,x)^{1/4}}2\,i\,(a-i\,a\,x)^{3/4}\left(-3+2^{3/4}\,(1+i\,x)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{1}{2}-\frac{i\,x}{2}\right]\right)$$

Problem 1209: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(a-i\,a\,x)^{5/4}\,(a+i\,a\,x)^{5/4}}\,dx$$

Optimal (type 4, 46 leaves, 3 steps):

$$\frac{2\,(1+x^2)^{1/4}\,\text{EllipticE}\left[\frac{\text{ArcTan}[x]}{2},2\right]}{a^2\,(a-i\,a\,x)^{1/4}\,(a+i\,a\,x)^{1/4}}$$

Result (type 5, 79 leaves):

$$\frac{6\,x-2\times2^{3/4}\,(1+i\,x)^{1/4}\,(i+x)\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{1}{2}-\frac{i\,x}{2}\right]}{3\,a^2\,(a-i\,a\,x)^{1/4}\,(a+i\,a\,x)^{1/4}}$$

Problem 1210: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(a-i\,a\,x)^{9/4}\,(a+i\,a\,x)^{5/4}}\,dx$$

Optimal (type 4, 82 leaves, 4 steps):

$$-\frac{2\,i}{5\,a^2\,(a-i\,a\,x)^{5/4}\,(a+i\,a\,x)^{1/4}}+\frac{6\,(1+x^2)^{1/4}\,\text{EllipticE}\left[\frac{\text{ArcTan}[x]}{2},2\right]}{5\,a^3\,(a-i\,a\,x)^{1/4}\,(a+i\,a\,x)^{1/4}}$$

Result (type 5, 96 leaves):

$$\left(2+6\,\mathrm{i}\,x+6\,x^2-2\times 2^{3/4}\,(1+\mathrm{i}\,x)^{1/4}\,(\mathrm{i}+x)^2\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{1}{2}-\frac{\mathrm{i}\,x}{2}\right]\right)\Big/\left(5\,a^3\,(\mathrm{i}+x)\,(a-\mathrm{i}\,a\,x)^{1/4}\,(a+\mathrm{i}\,a\,x)^{1/4}\right)$$

Problem 1211: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(a-\mathrm{i}\,a\,x)^{13/4}\,(a+\mathrm{i}\,a\,x)^{5/4}}\,dx$$

Optimal (type 4, 115 leaves, 5 steps):

$$-\frac{2\,\mathrm{i}}{9\,a^2\,(a-\mathrm{i}\,a\,x)^{9/4}\,(a+\mathrm{i}\,a\,x)^{1/4}}-\frac{2\,\mathrm{i}}{9\,a^3\,(a-\mathrm{i}\,a\,x)^{5/4}\,(a+\mathrm{i}\,a\,x)^{1/4}}+\frac{2\,(1+x^2)^{1/4}\,\text{EllipticE}\left[\frac{\text{ArcTan}[x]}{2},2\right]}{3\,a^4\,(a-\mathrm{i}\,a\,x)^{1/4}\,(a+\mathrm{i}\,a\,x)^{1/4}}$$

Result (type 5, 103 leaves):

$$\left(4\,\mathrm{i}-4\,x+12\,\mathrm{i}\,x^2+6\,x^3-2\times 2^{3/4}\,(1+\mathrm{i}\,x)^{1/4}\,(\mathrm{i}+x)^3\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{1}{2}-\frac{\mathrm{i}\,x}{2}\right]\right)\Big/\left(9\,a^4\,(\mathrm{i}+x)^2\,(a-\mathrm{i}\,a\,x)^{1/4}\,(a+\mathrm{i}\,a\,x)^{1/4}\right)$$

Problem 1212: Result unnecessarily involves higher level functions.

$$\int\frac{(a-\mathrm{i}\,a\,x)^{5/4}}{(a+\mathrm{i}\,a\,x)^{5/4}}\,dx$$

Optimal (type 3, 287 leaves, 13 steps):

$$\frac{4\,\mathrm{i}\,(a-\mathrm{i}\,a\,x)^{5/4}}{a\,(a+\mathrm{i}\,a\,x)^{1/4}}+\frac{5\,\mathrm{i}\,(a-\mathrm{i}\,a\,x)^{1/4}\,(a+\mathrm{i}\,a\,x)^{3/4}}{a}+\frac{5\,\mathrm{i}\,\text{ArcTan}\left[1-\frac{\sqrt{2}\,(a-\mathrm{i}\,a\,x)^{1/4}}{(a+\mathrm{i}\,a\,x)^{1/4}}\right]}{\sqrt{2}}-\frac{5\,\mathrm{i}\,\text{ArcTan}\left[1+\frac{\sqrt{2}\,(a-\mathrm{i}\,a\,x)^{1/4}}{(a+\mathrm{i}\,a\,x)^{1/4}}\right]}{\sqrt{2}}+\frac{5\,\mathrm{i}\,\text{Log}\left[1+\frac{\sqrt{a-\mathrm{i}\,a\,x}}{\sqrt{a+\mathrm{i}\,a\,x}}-\frac{\sqrt{2}\,(a-\mathrm{i}\,a\,x)^{1/4}}{(a+\mathrm{i}\,a\,x)^{1/4}}\right]}{2\,\sqrt{2}}-\frac{5\,\mathrm{i}\,\text{Log}\left[1+\frac{\sqrt{a-\mathrm{i}\,a\,x}}{\sqrt{a+\mathrm{i}\,a\,x}}+\frac{\sqrt{2}\,(a-\mathrm{i}\,a\,x)^{1/4}}{(a+\mathrm{i}\,a\,x)^{1/4}}\right]}{2\,\sqrt{2}}$$

Result (type 5, 72 leaves):

$$-\frac{1}{(a+\mathrm{i}\,a\,x)^{1/4}}(a-\mathrm{i}\,a\,x)^{1/4}\left(-9\,\mathrm{i}+x+5\,\mathrm{i}\,2^{3/4}\,(1+\mathrm{i}\,x)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},\frac{1}{2}-\frac{\mathrm{i}\,x}{2}\right]\right)$$

Problem 1213: Result unnecessarily involves higher level functions.

$$\int\frac{(a-\mathrm{i}\,a\,x)^{1/4}}{(a+\mathrm{i}\,a\,x)^{5/4}}\,dx$$

Optimal (type 3, 264 leaves, 12 steps):

$$\frac{4\,i\,(a-i\,a\,x)^{1/4}}{a\,(a+i\,a\,x)^{1/4}}+\frac{i\,\sqrt{2}\,\text{ArcTan}\left[1-\frac{\sqrt{2}\,(a-i\,a\,x)^{1/4}}{(a+i\,a\,x)^{1/4}}\right]}{a}-\frac{i\,\sqrt{2}\,\text{ArcTan}\left[1+\frac{\sqrt{2}\,(a-i\,a\,x)^{1/4}}{(a+i\,a\,x)^{1/4}}\right]}{a}+\frac{i\,\text{Log}\left[1+\frac{\sqrt{a-i\,a\,x}}{\sqrt{a+i\,a\,x}}-\frac{\sqrt{2}\,(a-i\,a\,x)^{1/4}}{(a+i\,a\,x)^{1/4}}\right]}{\sqrt{2}\,a}-\frac{i\,\text{Log}\left[1+\frac{\sqrt{a-i\,a\,x}}{\sqrt{a+i\,a\,x}}+\frac{\sqrt{2}\,(a-i\,a\,x)^{1/4}}{(a+i\,a\,x)^{1/4}}\right]}{\sqrt{2}\,a}$$

Result (type 5, 71 leaves):

$$-\frac{1}{a\,(a+i\,a\,x)^{1/4}}2\,i\,(a-i\,a\,x)^{1/4}\left(-2+2^{3/4}\,(1+i\,x)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},\frac{1}{2}-\frac{i\,x}{2}\right]\right)$$

Problem 1217: Result unnecessarily involves higher level functions.

$$\int\frac{(a-i\,a\,x)^{7/4}}{(a+i\,a\,x)^{9/4}}\,dx$$

Optimal (type 4, 141 leaves, 6 steps):

$$\frac{4\,i\,(a-i\,a\,x)^{7/4}}{5\,a\,(a+i\,a\,x)^{5/4}}+\frac{42\,x}{5\,(a-i\,a\,x)^{1/4}\,(a+i\,a\,x)^{1/4}}-\frac{28\,i\,(a-i\,a\,x)^{3/4}}{5\,a\,(a+i\,a\,x)^{1/4}}-\frac{42\,(1+x^2)^{1/4}\,\text{EllipticE}\left[\frac{\text{ArcTan}[x]}{2},2\right]}{5\,(a-i\,a\,x)^{1/4}\,(a+i\,a\,x)^{1/4}}$$

Result (type 5, 84 leaves):

$$\left(2\,(a-i\,a\,x)^{3/4}\left(-12-16\,i\,x+7\times 2^{3/4}\,(1+i\,x)^{5/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{1}{2}-\frac{i\,x}{2}\right]\right)\right)\Big/\left(5\,a\,(-i+x)\,(a+i\,a\,x)^{1/4}\right)$$

Problem 1218: Result unnecessarily involves higher level functions.

$$\int\frac{(a-i\,a\,x)^{3/4}}{(a+i\,a\,x)^{9/4}}\,dx$$

Optimal (type 4, 115 leaves, 5 steps):

$$\frac{4\,i\,(a-i\,a\,x)^{3/4}}{5\,a\,(a+i\,a\,x)^{5/4}}-\frac{6\,i}{5\,a\,(a-i\,a\,x)^{1/4}\,(a+i\,a\,x)^{1/4}}-\frac{6\,(1+x^2)^{1/4}\,\text{EllipticE}\left[\frac{\text{ArcTan}[x]}{2},2\right]}{5\,a\,(a-i\,a\,x)^{1/4}\,(a+i\,a\,x)^{1/4}}$$

Result (type 5, 83 leaves):

$$\left(2\,(a-i\,a\,x)^{3/4}\left(-1-3\,i\,x+2^{3/4}\,(1+i\,x)^{5/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{1}{2}-\frac{i\,x}{2}\right]\right)\right)\Big/\left(5\,a^2\,(-i+x)\,(a+i\,a\,x)^{1/4}\right)$$

Problem 1219: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a - i a x)^{1/4} (a + i a x)^{9/4}} \, dx$$

Optimal (type 4, 82 leaves, 4 steps):

$$\frac{4 i}{5 a (a - i a x)^{1/4} (a + i a x)^{5/4}} + \frac{2 (1 + x^2)^{1/4} \text{EllipticE}\left[\frac{\text{ArcTan}[x]}{2}, 2\right]}{5 a^2 (a - i a x)^{1/4} (a + i a x)^{1/4}}$$

Result (type 5, 84 leaves):

$$\left(2 (a - i a x)^{3/4} \left(6 + 3 i x - 2^{3/4} (1 + i x)^{5/4} \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{3}{4}, \frac{7}{4}, \frac{1}{2} - \frac{i x}{2}\right]\right)\right) \Big/ \left(15 a^3 (-i + x) (a + i a x)^{1/4}\right)$$

Problem 1220: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a - i a x)^{5/4} (a + i a x)^{9/4}} \, dx$$

Optimal (type 4, 82 leaves, 5 steps):

$$\frac{2 i}{5 a^2 (a - i a x)^{1/4} (a + i a x)^{5/4}} + \frac{6 (1 + x^2)^{1/4} \text{EllipticE}\left[\frac{\text{ArcTan}[x]}{2}, 2\right]}{5 a^3 (a - i a x)^{1/4} (a + i a x)^{1/4}}$$

Result (type 5, 94 leaves):

$$\left(2 - 6 i x + 6 x^2 - 2 \times 2^{3/4} (1 + i x)^{1/4} (1 + x^2) \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{3}{4}, \frac{7}{4}, \frac{1}{2} - \frac{i x}{2}\right]\right) \Big/ \left(5 a^3 (-i + x) (a - i a x)^{1/4} (a + i a x)^{1/4}\right)$$

Problem 1221: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a - i a x)^{9/4} (a + i a x)^{9/4}} \, dx$$

Optimal (type 4, 88 leaves, 4 steps):

$$\frac{2 x}{5 a^4 (a - i a x)^{1/4} (a + i a x)^{1/4} (1 + x^2)} + \frac{6 (1 + x^2)^{1/4} \text{EllipticE}\left[\frac{\text{ArcTan}[x]}{2}, 2\right]}{5 a^4 (a - i a x)^{1/4} (a + i a x)^{1/4}}$$

Result (type 5, 98 leaves):

$$\left(8 x + 6 x^3 - 2 \times 2^{3/4} (1 + i x)^{1/4} (-i + x) (i + x)^2 \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{3}{4}, \frac{7}{4}, \frac{1}{2} - \frac{i x}{2}\right]\right) \Big/ \left(5 a^4 (a - i a x)^{1/4} (a + i a x)^{1/4} (1 + x^2)\right)$$

Problem 1222: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a - i a x)^{13/4} (a + i a x)^{9/4}} \, dx$$

Optimal (type 4, 121 leaves, 5 steps):

$$-\frac{2 i}{9 a^2 (a - i a x)^{9/4} (a + i a x)^{5/4}} + \frac{14 x}{45 a^5 (a - i a x)^{1/4} (a + i a x)^{1/4} (1 + x^2)} + \frac{14 (1 + x^2)^{1/4} \text{EllipticE}\left[\frac{\text{ArcTan}[x]}{2}, 2\right]}{15 a^5 (a - i a x)^{1/4} (a + i a x)^{1/4}}$$

Result (type 5, 120 leaves):

$$\left(2 \left(5 + 28 i x + 28 x^2 + 21 i x^3 + 21 x^4 - 7 \times 2^{3/4} (1 + i x)^{1/4} (-i + x) (i + x)^3 \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{3}{4}, \frac{7}{4}, \frac{1}{2} - \frac{i x}{2}\right]\right)\right) \Big/ \left(45 a^5 (-i + x) (i + x)^2 (a - i a x)^{1/4} (a + i a x)^{1/4}\right)$$

Problem 1223: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a - i a x)^{17/4} (a + i a x)^{9/4}} \, dx$$

Optimal (type 4, 154 leaves, 6 steps):

$$-\frac{2 i}{13 a^2 (a - i a x)^{13/4} (a + i a x)^{5/4}} - \frac{2 i}{13 a^3 (a - i a x)^{9/4} (a + i a x)^{5/4}} + \frac{14 x}{65 a^6 (a - i a x)^{1/4} (a + i a x)^{1/4} (1 + x^2)} + \frac{42 (1 + x^2)^{1/4} \text{EllipticE}\left[\frac{\text{ArcTan}[x]}{2}, 2\right]}{65 a^6 (a - i a x)^{1/4} (a + i a x)^{1/4}}$$

Result (type 5, 127 leaves):

$$\left(2 \left(10 i - 23 x + 56 i x^2 + 7 x^3 + 42 i x^4 + 21 x^5 - 7 \times 2^{3/4} (1 + i x)^{1/4} (-i + x) (i + x)^4 \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{3}{4}, \frac{7}{4}, \frac{1}{2} - \frac{i x}{2}\right]\right)\right) \Big/ \left(65 a^6 (-i + x) (i + x)^3 (a - i a x)^{1/4} (a + i a x)^{1/4}\right)$$

Problem 1224: Result unnecessarily involves higher level functions.

$$\int \frac{(a - i a x)^{5/4}}{(a + i a x)^{9/4}} \, dx$$

Optimal (type 3, 297 leaves, 13 steps):

$$\frac{4\,i\,(a-i\,a\,x)^{5/4}}{5\,a\,(a+i\,a\,x)^{5/4}}-\frac{4\,i\,(a-i\,a\,x)^{1/4}}{a\,(a+i\,a\,x)^{1/4}}-\frac{i\,\sqrt{2}\,\text{ArcTan}\left[1-\frac{\sqrt{2}\,(a-i\,a\,x)^{1/4}}{(a+i\,a\,x)^{1/4}}\right]}{a}+\frac{i\,\sqrt{2}\,\text{ArcTan}\left[1+\frac{\sqrt{2}\,(a-i\,a\,x)^{1/4}}{(a+i\,a\,x)^{1/4}}\right]}{a}-\frac{i\,\text{Log}\left[1+\frac{\sqrt{a-i\,a\,x}}{\sqrt{a+i\,a\,x}}-\frac{\sqrt{2}\,(a-i\,a\,x)^{1/4}}{(a+i\,a\,x)^{1/4}}\right]}{\sqrt{2}\,a}+\frac{i\,\text{Log}\left[1+\frac{\sqrt{a-i\,a\,x}}{\sqrt{a+i\,a\,x}}+\frac{\sqrt{2}\,(a-i\,a\,x)^{1/4}}{(a+i\,a\,x)^{1/4}}\right]}{\sqrt{2}\,a}$$

Result (type 5, 84 leaves):

$$\left(2\,(a-i\,a\,x)^{1/4}\left(-8-12\,i\,x+5\times 2^{3/4}\,(1+i\,x)^{5/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},\frac{1}{2}-\frac{i\,x}{2}\right]\right)\right)\Big/\left(5\,a\,(-i+x)\,(a+i\,a\,x)^{1/4}\right)$$

Problem 1235: Result more than twice size of optimal antiderivative.

$$\int (3-6\,x)^m\,(2+4\,x)^m\,dx$$

Optimal (type 5, 20 leaves, 2 steps):

$$6^m\,x\,\text{Hypergeometric2F1}\left[\frac{1}{2},-m,\frac{3}{2},4\,x^2\right]$$

Result (type 5, 42 leaves):

$$(3-6\,x)^m\,x\,(2+4\,x)^m\,\left(1-4\,x^2\right)^{-m}\,\text{Hypergeometric2F1}\left[\frac{1}{2},-m,\frac{3}{2},4\,x^2\right]$$

Problem 1236: Result more than twice size of optimal antiderivative.

$$\int (a+b\,x)^4\,(c+d\,x)\,dx$$

Optimal (type 1, 38 leaves, 2 steps):

$$\frac{(b\,c-a\,d)\,(a+b\,x)^5}{5\,b^2}+\frac{d\,(a+b\,x)^6}{6\,b^2}$$

Result (type 1, 84 leaves):

$$\frac{1}{30}\,x\,\left(15\,a^4\,(2\,c+d\,x)+20\,a^3\,b\,x\,(3\,c+2\,d\,x)+15\,a^2\,b^2\,x^2\,(4\,c+3\,d\,x)+6\,a\,b^3\,x^3\,(5\,c+4\,d\,x)+b^4\,x^4\,(6\,c+5\,d\,x)\right)$$

Problem 1246: Result more than twice size of optimal antiderivative.

$$\int (a+b\,x)^4\,(c+d\,x)^2\,dx$$

Optimal (type 1, 65 leaves, 2 steps):

$$\frac{(b c-a d)^2 (a+b x)^5}{5 b^3}+\frac{d (b c-a d) (a+b x)^6}{3 b^3}+\frac{d^2 (a+b x)^7}{7 b^3}$$

Result (type 1, 148 leaves):

$$a^4 c^2 x+a^3 c (2 b c+a d) x^2+\frac{1}{3} a^2 \left(6 b^2 c^2+8 a b c d+a^2 d^2\right) x^3+a b \left(b^2 c^2+3 a b c d+a^2 d^2\right) x^4+\frac{1}{5} b^2 \left(b^2 c^2+8 a b c d+6 a^2 d^2\right) x^5+\frac{1}{3} b^3 d (b c+2 a d) x^6+\frac{1}{7} b^4 d^2 x^7$$

Problem 1258: Result more than twice size of optimal antiderivative.

$$\int (a+b x)^5 (c+d x)^3 \, dx$$

Optimal (type 1, 92 leaves, 2 steps):

$$\frac{(b c-a d)^3 (a+b x)^6}{6 b^4}+\frac{3 d (b c-a d)^2 (a+b x)^7}{7 b^4}+\frac{3 d^2 (b c-a d) (a+b x)^8}{8 b^4}+\frac{d^3 (a+b x)^9}{9 b^4}$$

Result (type 1, 235 leaves):

$$\frac{1}{504} x \left(126 a^5 \left(4 c^3+6 c^2 d x+4 c d^2 x^2+d^3 x^3\right)+126 a^4 b x \left(10 c^3+20 c^2 d x+15 c d^2 x^2+4 d^3 x^3\right)+84 a^3 b^2 x^2 \left(20 c^3+45 c^2 d x+36 c d^2 x^2+10 d^3 x^3\right)+36 a^2 b^3 x^3 \left(35 c^3+84 c^2 d x+70 c d^2 x^2+20 d^3 x^3\right)+9 a b^4 x^4 \left(56 c^3+140 c^2 d x+120 c d^2 x^2+35 d^3 x^3\right)+b^5 x^5 \left(84 c^3+216 c^2 d x+189 c d^2 x^2+56 d^3 x^3\right)\right)$$

Problem 1259: Result more than twice size of optimal antiderivative.

$$\int (a+b x)^4 (c+d x)^3 \, dx$$

Optimal (type 1, 92 leaves, 2 steps):

$$\frac{(b c-a d)^3 (a+b x)^5}{5 b^4}+\frac{d (b c-a d)^2 (a+b x)^6}{2 b^4}+\frac{3 d^2 (b c-a d) (a+b x)^7}{7 b^4}+\frac{d^3 (a+b x)^8}{8 b^4}$$

Result (type 1, 217 leaves):

$$a^4 c^3 x+\frac{1}{2} a^3 c^2 (4 b c+3 a d) x^2+a^2 c \left(2 b^2 c^2+4 a b c d+a^2 d^2\right) x^3+\frac{1}{4} a \left(4 b^3 c^3+18 a b^2 c^2 d+12 a^2 b c d^2+a^3 d^3\right) x^4+\frac{1}{5} b \left(b^3 c^3+12 a b^2 c^2 d+18 a^2 b c d^2+4 a^3 d^3\right) x^5+\frac{1}{2} b^2 d \left(b^2 c^2+4 a b c d+2 a^2 d^2\right) x^6+\frac{1}{7} b^3 d^2 (3 b c+4 a d) x^7+\frac{1}{8} b^4 d^3 x^8$$

Problem 1268: Result more than twice size of optimal antiderivative.

$$\int \frac{(c+d x)^3}{(a+b x)^5} \, dx$$

Optimal (type 1, 28 leaves, 1 step):

$$-\frac{(c+d\,x)^4}{4\,(b\,c-a\,d)\,(a+b\,x)^4}$$

Result (type 1, 91 leaves):

$$-\frac{1}{4\,b^4\,(a+b\,x)^4}\left(a^3\,d^3+a^2\,b\,d^2\,(c+4\,d\,x)+a\,b^2\,d\,\left(c^2+4\,c\,d\,x+6\,d^2\,x^2\right)+b^3\,\left(c^3+4\,c^2\,d\,x+6\,c\,d^2\,x^2+4\,d^3\,x^3\right)\right)$$

Problem 1273: Result more than twice size of optimal antiderivative.

$$\int (a+b\,x)^9\,(c+d\,x)^7\,dx$$

Optimal (type 1, 200 leaves, 2 steps):

$$\frac{(b\,c-a\,d)^7\,(a+b\,x)^{10}}{10\,b^8}+\frac{7\,d\,(b\,c-a\,d)^6\,(a+b\,x)^{11}}{11\,b^8}+\frac{7\,d^2\,(b\,c-a\,d)^5\,(a+b\,x)^{12}}{4\,b^8}+\frac{35\,d^3\,(b\,c-a\,d)^4\,(a+b\,x)^{13}}{13\,b^8}+\frac{5\,d^4\,(b\,c-a\,d)^3\,(a+b\,x)^{14}}{2\,b^8}+\frac{7\,d^5\,(b\,c-a\,d)^2\,(a+b\,x)^{15}}{5\,b^8}+\frac{7\,d^6\,(b\,c-a\,d)\,(a+b\,x)^{16}}{16\,b^8}+\frac{d^7\,(a+b\,x)^{17}}{17\,b^8}$$

Result (type 1, 993 leaves):

$$a^9 c^7 x + \frac{1}{2} a^8 c^6 (9 b c + 7 a d) x^2 + a^7 c^5 (12 b^2 c^2 + 21 a b c d + 7 a^2 d^2) x^3 +$$
$$\frac{7}{4} a^6 c^4 (12 b^3 c^3 + 36 a b^2 c^2 d + 27 a^2 b c d^2 + 5 a^3 d^3) x^4 +$$
$$\frac{7}{5} a^5 c^3 (18 b^4 c^4 + 84 a b^3 c^3 d + 108 a^2 b^2 c^2 d^2 + 45 a^3 b c d^3 + 5 a^4 d^4) x^5 +$$
$$\frac{7}{2} a^4 c^2 (6 b^5 c^5 + 42 a b^4 c^4 d + 84 a^2 b^3 c^3 d^2 + 60 a^3 b^2 c^2 d^3 + 15 a^4 b c d^4 + a^5 d^5) x^6 +$$
$$a^3 c (12 b^6 c^6 + 126 a b^5 c^5 d + 378 a^2 b^4 c^4 d^2 + 420 a^3 b^3 c^3 d^3 + 180 a^4 b^2 c^2 d^4 + 27 a^5 b c d^5 + a^6 d^6) x^7 +$$
$$\frac{1}{8} a^2 (36 b^7 c^7 + 588 a b^6 c^6 d + 2646 a^2 b^5 c^5 d^2 +$$
$$4410 a^3 b^4 c^4 d^3 + 2940 a^4 b^3 c^3 d^4 + 756 a^5 b^2 c^2 d^5 + 63 a^6 b c d^6 + a^7 d^7) x^8 +$$
$$a b (b^7 c^7 + 28 a b^6 c^6 d + 196 a^2 b^5 c^5 d^2 + 490 a^3 b^4 c^4 d^3 + 490 a^4 b^3 c^3 d^4 + 196 a^5 b^2 c^2 d^5 +$$
$$28 a^6 b c d^6 + a^7 d^7) x^9 + \frac{1}{10} b^2 (b^7 c^7 + 63 a b^6 c^6 d + 756 a^2 b^5 c^5 d^2 + 2940 a^3 b^4 c^4 d^3 +$$
$$4410 a^4 b^3 c^3 d^4 + 2646 a^5 b^2 c^2 d^5 + 588 a^6 b c d^6 + 36 a^7 d^7) x^{10} + \frac{7}{11} b^3 d$$
$$(b^6 c^6 + 27 a b^5 c^5 d + 180 a^2 b^4 c^4 d^2 + 420 a^3 b^3 c^3 d^3 + 378 a^4 b^2 c^2 d^4 + 126 a^5 b c d^5 + 12 a^6 d^6) x^{11} +$$
$$\frac{7}{4} b^4 d^2 (b^5 c^5 + 15 a b^4 c^4 d + 60 a^2 b^3 c^3 d^2 + 84 a^3 b^2 c^2 d^3 + 42 a^4 b c d^4 + 6 a^5 d^5) x^{12} +$$
$$\frac{7}{13} b^5 d^3 (5 b^4 c^4 + 45 a b^3 c^3 d + 108 a^2 b^2 c^2 d^2 + 84 a^3 b c d^3 + 18 a^4 d^4) x^{13} +$$
$$\frac{1}{2} b^6 d^4 (5 b^3 c^3 + 27 a b^2 c^2 d + 36 a^2 b c d^2 + 12 a^3 d^3) x^{14} +$$
$$\frac{1}{5} b^7 d^5 (7 b^2 c^2 + 21 a b c d + 12 a^2 d^2) x^{15} + \frac{1}{16} b^8 d^6 (7 b c + 9 a d) x^{16} + \frac{1}{17} b^9 d^7 x^{17}$$

Problem 1274: Result more than twice size of optimal antiderivative.

$$\int (a + b x)^8 (c + d x)^7 \, dx$$

Optimal (type 1, 200 leaves, 2 steps):

$$\frac{(b c - a d)^7 (a + b x)^9}{9 b^8} + \frac{7 d (b c - a d)^6 (a + b x)^{10}}{10 b^8} +$$
$$\frac{21 d^2 (b c - a d)^5 (a + b x)^{11}}{11 b^8} + \frac{35 d^3 (b c - a d)^4 (a + b x)^{12}}{12 b^8} + \frac{35 d^4 (b c - a d)^3 (a + b x)^{13}}{13 b^8} +$$
$$\frac{3 d^5 (b c - a d)^2 (a + b x)^{14}}{2 b^8} + \frac{7 d^6 (b c - a d) (a + b x)^{15}}{15 b^8} + \frac{d^7 (a + b x)^{16}}{16 b^8}$$

Result (type 1, 897 leaves):

$$a^8 c^7 x + \frac{1}{2} a^7 c^6 (8 b c + 7 a d) x^2 + \frac{7}{3} a^6 c^5 (4 b^2 c^2 + 8 a b c d + 3 a^2 d^2) x^3 +$$
$$\frac{7}{4} a^5 c^4 (8 b^3 c^3 + 28 a b^2 c^2 d + 24 a^2 b c d^2 + 5 a^3 d^3) x^4 +$$
$$\frac{7}{5} a^4 c^3 (10 b^4 c^4 + 56 a b^3 c^3 d + 84 a^2 b^2 c^2 d^2 + 40 a^3 b c d^3 + 5 a^4 d^4) x^5 +$$
$$\frac{7}{6} a^3 c^2 (8 b^5 c^5 + 70 a b^4 c^4 d + 168 a^2 b^3 c^3 d^2 + 140 a^3 b^2 c^2 d^3 + 40 a^4 b c d^4 + 3 a^5 d^5) x^6 +$$
$$a^2 c (4 b^6 c^6 + 56 a b^5 c^5 d + 210 a^2 b^4 c^4 d^2 + 280 a^3 b^3 c^3 d^3 + 140 a^4 b^2 c^2 d^4 + 24 a^5 b c d^5 + a^6 d^6) x^7 +$$
$$\frac{1}{8} a (8 b^7 c^7 + 196 a b^6 c^6 d + 1176 a^2 b^5 c^5 d^2 + 2450 a^3 b^4 c^4 d^3 + 1960 a^4 b^3 c^3 d^4 +$$
$$588 a^5 b^2 c^2 d^5 + 56 a^6 b c d^6 + a^7 d^7) x^8 + \frac{1}{9} b (b^7 c^7 + 56 a b^6 c^6 d + 588 a^2 b^5 c^5 d^2 +$$
$$1960 a^3 b^4 c^4 d^3 + 2450 a^4 b^3 c^3 d^4 + 1176 a^5 b^2 c^2 d^5 + 196 a^6 b c d^6 + 8 a^7 d^7) x^9 +$$
$$\frac{7}{10} b^2 d (b^6 c^6 + 24 a b^5 c^5 d + 140 a^2 b^4 c^4 d^2 + 280 a^3 b^3 c^3 d^3 + 210 a^4 b^2 c^2 d^4 + 56 a^5 b c d^5 + 4 a^6 d^6) x^{10} +$$
$$\frac{7}{11} b^3 d^2 (3 b^5 c^5 + 40 a b^4 c^4 d + 140 a^2 b^3 c^3 d^2 + 168 a^3 b^2 c^2 d^3 + 70 a^4 b c d^4 + 8 a^5 d^5) x^{11} +$$
$$\frac{7}{12} b^4 d^3 (5 b^4 c^4 + 40 a b^3 c^3 d + 84 a^2 b^2 c^2 d^2 + 56 a^3 b c d^3 + 10 a^4 d^4) x^{12} +$$
$$\frac{7}{13} b^5 d^4 (5 b^3 c^3 + 24 a b^2 c^2 d + 28 a^2 b c d^2 + 8 a^3 d^3) x^{13} +$$
$$\frac{1}{2} b^6 d^5 (3 b^2 c^2 + 8 a b c d + 4 a^2 d^2) x^{14} + \frac{1}{15} b^7 d^6 (7 b c + 8 a d) x^{15} + \frac{1}{16} b^8 d^7 x^{16}$$

Problem 1275: Result more than twice size of optimal antiderivative.

$$\int (a + b x)^7 (c + d x)^7 \, dx$$

Optimal (type 1, 200 leaves, 2 steps):

$$\frac{(b c - a d)^7 (a + b x)^8}{8 b^8} + \frac{7 d (b c - a d)^6 (a + b x)^9}{9 b^8} + \frac{21 d^2 (b c - a d)^5 (a + b x)^{10}}{10 b^8} +$$
$$\frac{35 d^3 (b c - a d)^4 (a + b x)^{11}}{11 b^8} + \frac{35 d^4 (b c - a d)^3 (a + b x)^{12}}{12 b^8} +$$
$$\frac{21 d^5 (b c - a d)^2 (a + b x)^{13}}{13 b^8} + \frac{d^6 (b c - a d) (a + b x)^{14}}{2 b^8} + \frac{d^7 (a + b x)^{15}}{15 b^8}$$

Result (type 1, 785 leaves):

$$a^7 c^7 x + \frac{7}{2} a^6 c^6 (b c + a d) x^2 + \frac{7}{3} a^5 c^5 (3 b^2 c^2 + 7 a b c d + 3 a^2 d^2) x^3 +$$
$$\frac{7}{4} a^4 c^4 (5 b^3 c^3 + 21 a b^2 c^2 d + 21 a^2 b c d^2 + 5 a^3 d^3) x^4 +$$
$$\frac{7}{5} a^3 c^3 (5 b^4 c^4 + 35 a b^3 c^3 d + 63 a^2 b^2 c^2 d^2 + 35 a^3 b c d^3 + 5 a^4 d^4) x^5 +$$
$$\frac{7}{6} a^2 c^2 (3 b^5 c^5 + 35 a b^4 c^4 d + 105 a^2 b^3 c^3 d^2 + 105 a^3 b^2 c^2 d^3 + 35 a^4 b c d^4 + 3 a^5 d^5) x^6 +$$
$$a c (b^6 c^6 + 21 a b^5 c^5 d + 105 a^2 b^4 c^4 d^2 + 175 a^3 b^3 c^3 d^3 + 105 a^4 b^2 c^2 d^4 + 21 a^5 b c d^5 + a^6 d^6) x^7 +$$
$$\frac{1}{8} (b^7 c^7 + 49 a b^6 c^6 d + 441 a^2 b^5 c^5 d^2 + 1225 a^3 b^4 c^4 d^3 +$$
$$1225 a^4 b^3 c^3 d^4 + 441 a^5 b^2 c^2 d^5 + 49 a^6 b c d^6 + a^7 d^7) x^8 +$$
$$\frac{7}{9} b d (b^6 c^6 + 21 a b^5 c^5 d + 105 a^2 b^4 c^4 d^2 + 175 a^3 b^3 c^3 d^3 + 105 a^4 b^2 c^2 d^4 + 21 a^5 b c d^5 + a^6 d^6) x^9 +$$
$$\frac{7}{10} b^2 d^2 (3 b^5 c^5 + 35 a b^4 c^4 d + 105 a^2 b^3 c^3 d^2 + 105 a^3 b^2 c^2 d^3 + 35 a^4 b c d^4 + 3 a^5 d^5) x^{10} +$$
$$\frac{7}{11} b^3 d^3 (5 b^4 c^4 + 35 a b^3 c^3 d + 63 a^2 b^2 c^2 d^2 + 35 a^3 b c d^3 + 5 a^4 d^4) x^{11} +$$
$$\frac{7}{12} b^4 d^4 (5 b^3 c^3 + 21 a b^2 c^2 d + 21 a^2 b c d^2 + 5 a^3 d^3) x^{12} +$$
$$\frac{7}{13} b^5 d^5 (3 b^2 c^2 + 7 a b c d + 3 a^2 d^2) x^{13} + \frac{1}{2} b^6 d^6 (b c + a d) x^{14} + \frac{1}{15} b^7 d^7 x^{15}$$

Problem 1276: Result more than twice size of optimal antiderivative.

$$\int (a + b x)^6 (c + d x)^7 \, dx$$

Optimal (type 1, 173 leaves, 2 steps):

$$\frac{(b c - a d)^6 (c + d x)^8}{8 d^7} - \frac{2 b (b c - a d)^5 (c + d x)^9}{3 d^7} + \frac{3 b^2 (b c - a d)^4 (c + d x)^{10}}{2 d^7} -$$
$$\frac{20 b^3 (b c - a d)^3 (c + d x)^{11}}{11 d^7} + \frac{5 b^4 (b c - a d)^2 (c + d x)^{12}}{4 d^7} - \frac{6 b^5 (b c - a d) (c + d x)^{13}}{13 d^7} + \frac{b^6 (c + d x)^{14}}{14 d^7}$$

Result (type 1, 684 leaves):

$$a^6 c^7 x + \frac{1}{2} a^5 c^6 (6 b c + 7 a d) x^2 + a^4 c^5 (5 b^2 c^2 + 14 a b c d + 7 a^2 d^2) x^3 +$$
$$\frac{1}{4} a^3 c^4 (20 b^3 c^3 + 105 a b^2 c^2 d + 126 a^2 b c d^2 + 35 a^3 d^3) x^4 +$$
$$a^2 c^3 (3 b^4 c^4 + 28 a b^3 c^3 d + 63 a^2 b^2 c^2 d^2 + 42 a^3 b c d^3 + 7 a^4 d^4) x^5 +$$
$$\frac{1}{2} a c^2 (2 b^5 c^5 + 35 a b^4 c^4 d + 140 a^2 b^3 c^3 d^2 + 175 a^3 b^2 c^2 d^3 + 70 a^4 b c d^4 + 7 a^5 d^5) x^6 +$$
$$\frac{1}{7} c (b^6 c^6 + 42 a b^5 c^5 d + 315 a^2 b^4 c^4 d^2 + 700 a^3 b^3 c^3 d^3 + 525 a^4 b^2 c^2 d^4 + 126 a^5 b c d^5 + 7 a^6 d^6) x^7 +$$
$$\frac{1}{8} d (7 b^6 c^6 + 126 a b^5 c^5 d + 525 a^2 b^4 c^4 d^2 + 700 a^3 b^3 c^3 d^3 + 315 a^4 b^2 c^2 d^4 + 42 a^5 b c d^5 + a^6 d^6) x^8 +$$
$$\frac{1}{3} b d^2 (7 b^5 c^5 + 70 a b^4 c^4 d + 175 a^2 b^3 c^3 d^2 + 140 a^3 b^2 c^2 d^3 + 35 a^4 b c d^4 + 2 a^5 d^5) x^9 +$$
$$\frac{1}{2} b^2 d^3 (7 b^4 c^4 + 42 a b^3 c^3 d + 63 a^2 b^2 c^2 d^2 + 28 a^3 b c d^3 + 3 a^4 d^4) x^{10} +$$
$$\frac{1}{11} b^3 d^4 (35 b^3 c^3 + 126 a b^2 c^2 d + 105 a^2 b c d^2 + 20 a^3 d^3) x^{11} +$$
$$\frac{1}{4} b^4 d^5 (7 b^2 c^2 + 14 a b c d + 5 a^2 d^2) x^{12} + \frac{1}{13} b^5 d^6 (7 b c + 6 a d) x^{13} + \frac{1}{14} b^6 d^7 x^{14}$$

Problem 1277: Result more than twice size of optimal antiderivative.

$$\int (a + b x)^5 (c + d x)^7 \, dx$$

Optimal (type 1, 144 leaves, 2 steps):

$$-\frac{(b c - a d)^5 (c + d x)^8}{8 d^6} + \frac{5 b (b c - a d)^4 (c + d x)^9}{9 d^6} - \frac{b^2 (b c - a d)^3 (c + d x)^{10}}{d^6} +$$
$$\frac{10 b^3 (b c - a d)^2 (c + d x)^{11}}{11 d^6} - \frac{5 b^4 (b c - a d) (c + d x)^{12}}{12 d^6} + \frac{b^5 (c + d x)^{13}}{13 d^6}$$

Result (type 1, 574 leaves):

$$a^5 c^7 x + \frac{1}{2} a^4 c^6 (5 b c + 7 a d) x^2 + \frac{1}{3} a^3 c^5 (10 b^2 c^2 + 35 a b c d + 21 a^2 d^2) x^3 +$$
$$\frac{5}{4} a^2 c^4 (2 b^3 c^3 + 14 a b^2 c^2 d + 21 a^2 b c d^2 + 7 a^3 d^3) x^4 +$$
$$a c^3 (b^4 c^4 + 14 a b^3 c^3 d + 42 a^2 b^2 c^2 d^2 + 35 a^3 b c d^3 + 7 a^4 d^4) x^5 +$$
$$\frac{1}{6} c^2 (b^5 c^5 + 35 a b^4 c^4 d + 210 a^2 b^3 c^3 d^2 + 350 a^3 b^2 c^2 d^3 + 175 a^4 b c d^4 + 21 a^5 d^5) x^6 +$$
$$c d (b^5 c^5 + 15 a b^4 c^4 d + 50 a^2 b^3 c^3 d^2 + 50 a^3 b^2 c^2 d^3 + 15 a^4 b c d^4 + a^5 d^5) x^7 +$$
$$\frac{1}{8} d^2 (21 b^5 c^5 + 175 a b^4 c^4 d + 350 a^2 b^3 c^3 d^2 + 210 a^3 b^2 c^2 d^3 + 35 a^4 b c d^4 + a^5 d^5) x^8 +$$
$$\frac{5}{9} b d^3 (7 b^4 c^4 + 35 a b^3 c^3 d + 42 a^2 b^2 c^2 d^2 + 14 a^3 b c d^3 + a^4 d^4) x^9 +$$
$$\frac{1}{2} b^2 d^4 (7 b^3 c^3 + 21 a b^2 c^2 d + 14 a^2 b c d^2 + 2 a^3 d^3) x^{10} +$$
$$\frac{1}{11} b^3 d^5 (21 b^2 c^2 + 35 a b c d + 10 a^2 d^2) x^{11} + \frac{1}{12} b^4 d^6 (7 b c + 5 a d) x^{12} + \frac{1}{13} b^5 d^7 x^{13}$$

Problem 1278: Result more than twice size of optimal antiderivative.

$$\int (a + b x)^4 (c + d x)^7 \, dx$$

Optimal (type 1, 119 leaves, 2 steps):

$$\frac{(b c - a d)^4 (c + d x)^8}{8 d^5} - \frac{4 b (b c - a d)^3 (c + d x)^9}{9 d^5} +$$
$$\frac{3 b^2 (b c - a d)^2 (c + d x)^{10}}{5 d^5} - \frac{4 b^3 (b c - a d) (c + d x)^{11}}{11 d^5} + \frac{b^4 (c + d x)^{12}}{12 d^5}$$

Result (type 1, 473 leaves):

$$a^4 c^7 x + \frac{1}{2} a^3 c^6 (4 b c + 7 a d) x^2 + \frac{1}{3} a^2 c^5 (6 b^2 c^2 + 28 a b c d + 21 a^2 d^2) x^3 +$$
$$\frac{1}{4} a c^4 (4 b^3 c^3 + 42 a b^2 c^2 d + 84 a^2 b c d^2 + 35 a^3 d^3) x^4 +$$
$$\frac{1}{5} c^3 (b^4 c^4 + 28 a b^3 c^3 d + 126 a^2 b^2 c^2 d^2 + 140 a^3 b c d^3 + 35 a^4 d^4) x^5 +$$
$$\frac{7}{6} c^2 d (b^4 c^4 + 12 a b^3 c^3 d + 30 a^2 b^2 c^2 d^2 + 20 a^3 b c d^3 + 3 a^4 d^4) x^6 +$$
$$c d^2 (3 b^4 c^4 + 20 a b^3 c^3 d + 30 a^2 b^2 c^2 d^2 + 12 a^3 b c d^3 + a^4 d^4) x^7 +$$
$$\frac{1}{8} d^3 (35 b^4 c^4 + 140 a b^3 c^3 d + 126 a^2 b^2 c^2 d^2 + 28 a^3 b c d^3 + a^4 d^4) x^8 +$$
$$\frac{1}{9} b d^4 (35 b^3 c^3 + 84 a b^2 c^2 d + 42 a^2 b c d^2 + 4 a^3 d^3) x^9 +$$
$$\frac{1}{10} b^2 d^5 (21 b^2 c^2 + 28 a b c d + 6 a^2 d^2) x^{10} + \frac{1}{11} b^3 d^6 (7 b c + 4 a d) x^{11} + \frac{1}{12} b^4 d^7 x^{12}$$

Problem 1279: Result more than twice size of optimal antiderivative.

$$\int (a+b x)^3 (c+d x)^7 \, dx$$

Optimal (type 1, 92 leaves, 2 steps):

$$-\frac{(b c-a d)^3 (c+d x)^8}{8 d^4}+\frac{b (b c-a d)^2 (c+d x)^9}{3 d^4}-\frac{3 b^2 (b c-a d) (c+d x)^{10}}{10 d^4}+\frac{b^3 (c+d x)^{11}}{11 d^4}$$

Result (type 1, 360 leaves):

$$a^3 c^7 x+\frac{1}{2} a^2 c^6 (3 b c+7 a d) x^2+a c^5 \left(b^2 c^2+7 a b c d+7 a^2 d^2\right) x^3+\frac{1}{4} c^4 \left(b^3 c^3+21 a b^2 c^2 d+63 a^2 b c d^2+35 a^3 d^3\right) x^4+\frac{7}{5} c^3 d \left(b^3 c^3+9 a b^2 c^2 d+15 a^2 b c d^2+5 a^3 d^3\right) x^5+\frac{7}{2} c^2 d^2 \left(b^3 c^3+5 a b^2 c^2 d+5 a^2 b c d^2+a^3 d^3\right) x^6+c d^3 \left(5 b^3 c^3+15 a b^2 c^2 d+9 a^2 b c d^2+a^3 d^3\right) x^7+\frac{1}{8} d^4 \left(35 b^3 c^3+63 a b^2 c^2 d+21 a^2 b c d^2+a^3 d^3\right) x^8+\frac{1}{3} b d^5 \left(7 b^2 c^2+7 a b c d+a^2 d^2\right) x^9+\frac{1}{10} b^2 d^6 (7 b c+3 a d) x^{10}+\frac{1}{11} b^3 d^7 x^{11}$$

Problem 1280: Result more than twice size of optimal antiderivative.

$$\int (a+b x)^2 (c+d x)^7 \, dx$$

Optimal (type 1, 65 leaves, 2 steps):

$$\frac{(b c-a d)^2 (c+d x)^8}{8 d^3}-\frac{2 b (b c-a d) (c+d x)^9}{9 d^3}+\frac{b^2 (c+d x)^{10}}{10 d^3}$$

Result (type 1, 261 leaves):

$$a^2 c^7 x+\frac{1}{2} a c^6 (2 b c+7 a d) x^2+\frac{1}{3} c^5 \left(b^2 c^2+14 a b c d+21 a^2 d^2\right) x^3+\frac{7}{4} c^4 d \left(b^2 c^2+6 a b c d+5 a^2 d^2\right) x^4+\frac{7}{5} c^3 d^2 \left(3 b^2 c^2+10 a b c d+5 a^2 d^2\right) x^5+\frac{7}{6} c^2 d^3 \left(5 b^2 c^2+10 a b c d+3 a^2 d^2\right) x^6+c d^4 \left(5 b^2 c^2+6 a b c d+a^2 d^2\right) x^7+\frac{1}{8} d^5 \left(21 b^2 c^2+14 a b c d+a^2 d^2\right) x^8+\frac{1}{9} b d^6 (7 b c+2 a d) x^9+\frac{1}{10} b^2 d^7 x^{10}$$

Problem 1281: Result more than twice size of optimal antiderivative.

$$\int (a+b x) (c+d x)^7 \, dx$$

Optimal (type 1, 38 leaves, 2 steps):

$$-\frac{(b c-a d)(c+d x)^8}{8 d^2}+\frac{b (c+d x)^9}{9 d^2}$$

Result (type 1, 151 leaves):

$$a c^7 x+\frac{1}{2} c^6 (b c+7 a d) x^2+\frac{7}{3} c^5 d (b c+3 a d) x^3+\frac{7}{4} c^4 d^2 (3 b c+5 a d) x^4+7 c^3 d^3 (b c+a d) x^5+\frac{7}{6} c^2 d^4 (5 b c+3 a d) x^6+c d^5 (3 b c+a d) x^7+\frac{1}{8} d^6 (7 b c+a d) x^8+\frac{1}{9} b d^7 x^9$$

Problem 1284: Result more than twice size of optimal antiderivative.

$$\int \frac{(c+d x)^7}{(a+b x)^2} \, dx$$

Optimal (type 3, 187 leaves, 2 steps):

$$\frac{21 d^2 (b c-a d)^5 x}{b^7}-\frac{(b c-a d)^7}{b^8 (a+b x)}+\frac{35 d^3 (b c-a d)^4 (a+b x)^2}{2 b^8}+\frac{35 d^4 (b c-a d)^3 (a+b x)^3}{3 b^8}+\frac{21 d^5 (b c-a d)^2 (a+b x)^4}{4 b^8}+\frac{7 d^6 (b c-a d) (a+b x)^5}{5 b^8}+\frac{d^7 (a+b x)^6}{6 b^8}+\frac{7 d (b c-a d)^6 \text{Log}[a+b x]}{b^8}$$

Result (type 3, 388 leaves):

$$\frac{1}{60 b^8 (a+b x)}\Big(60 a^7 d^7-60 a^6 b d^6 (7 c+6 d x)+210 a^5 b^2 d^5 (6 c^2+10 c d x-d^2 x^2)+70 a^4 b^3 d^4 (-30 c^3-72 c^2 d x+18 c d^2 x^2+d^3 x^3)-35 a^3 b^4 d^3 (-60 c^4-180 c^3 d x+90 c^2 d^2 x^2+12 c d^3 x^3+d^4 x^4)+21 a^2 b^5 d^2 (-60 c^5-200 c^4 d x+200 c^3 d^2 x^2+50 c^2 d^3 x^3+10 c d^4 x^4+d^5 x^5)-7 a b^6 d (-60 c^6-180 c^5 d x+450 c^4 d^2 x^2+200 c^3 d^3 x^3+75 c^2 d^4 x^4+18 c d^5 x^5+2 d^6 x^6)+b^7 (-60 c^7+1260 c^5 d^2 x^2+1050 c^4 d^3 x^3+700 c^3 d^4 x^4+315 c^2 d^5 x^5+84 c d^6 x^6+10 d^7 x^7)+420 d (b c-a d)^6 (a+b x) \text{Log}[a+b x]\Big)$$

Problem 1285: Result more than twice size of optimal antiderivative.

$$\int \frac{(c+d x)^7}{(a+b x)^3} \, dx$$

Optimal (type 3, 185 leaves, 2 steps):

$$\frac{35 d^3 (b c-a d)^4 x}{b^7}-\frac{(b c-a d)^7}{2 b^8 (a+b x)^2}-\frac{7 d (b c-a d)^6}{b^8 (a+b x)}+\frac{35 d^4 (b c-a d)^3 (a+b x)^2}{2 b^8}+\frac{7 d^5 (b c-a d)^2 (a+b x)^3}{b^8}+\frac{7 d^6 (b c-a d) (a+b x)^4}{4 b^8}+\frac{d^7 (a+b x)^5}{5 b^8}+\frac{21 d^2 (b c-a d)^5 \text{Log}[a+b x]}{b^8}$$

Result (type 3, 389 leaves):

$$\frac{1}{20\,b^8\,(a+b\,x)^2}\Big(-130\,a^7\,d^7+10\,a^6\,b\,d^6\,(77\,c+16\,d\,x)+10\,a^5\,b^2\,d^5\,(-189\,c^2-56\,c\,d\,x+50\,d^2\,x^2)+70\,a^4\,b^3\,d^4\,(35\,c^3+6\,c^2\,d\,x-34\,c\,d^2\,x^2+2\,d^3\,x^3)-35\,a^3\,b^4\,d^3\,(50\,c^4-20\,c^3\,d\,x-126\,c^2\,d^2\,x^2+20\,c\,d^3\,x^3+d^4\,x^4)+7\,a^2\,b^5\,d^2\,(90\,c^5-200\,c^4\,d\,x-550\,c^3\,d^2\,x^2+200\,c^2\,d^3\,x^3+25\,c\,d^4\,x^4+2\,d^5\,x^5)-7\,a\,b^6\,d\,(10\,c^6-120\,c^5\,d\,x-200\,c^4\,d^2\,x^2+200\,c^3\,d^3\,x^3+50\,c^2\,d^4\,x^4+10\,c\,d^5\,x^5+d^6\,x^6)+b^7\,(-10\,c^7-140\,c^6\,d\,x+700\,c^4\,d^3\,x^3+350\,c^3\,d^4\,x^4+140\,c^2\,d^5\,x^5+35\,c\,d^6\,x^6+4\,d^7\,x^7)-420\,d^2\,(-b\,c+a\,d)^5\,(a+b\,x)^2\,\mathrm{Log}[a+b\,x]\Big)$$

Problem 1288: Result more than twice size of optimal antiderivative.

$$\int\frac{(c+d\,x)^7}{(a+b\,x)^6}\,dx$$

Optimal (type 3, 181 leaves, 2 steps):

$$\frac{d^6\,(7\,b\,c-6\,a\,d)\,x}{b^7}+\frac{d^7\,x^2}{2\,b^6}-\frac{(b\,c-a\,d)^7}{5\,b^8\,(a+b\,x)^5}-\frac{7\,d\,(b\,c-a\,d)^6}{4\,b^8\,(a+b\,x)^4}-\frac{7\,d^2\,(b\,c-a\,d)^5}{b^8\,(a+b\,x)^3}-\frac{35\,d^3\,(b\,c-a\,d)^4}{2\,b^8\,(a+b\,x)^2}-\frac{35\,d^4\,(b\,c-a\,d)^3}{b^8\,(a+b\,x)}+\frac{21\,d^5\,(b\,c-a\,d)^2\,\mathrm{Log}[a+b\,x]}{b^8}$$

Result (type 3, 389 leaves):

$$\frac{1}{20\,b^8\,(a+b\,x)^5}\Big(459\,a^7\,d^7+3\,a^6\,b\,d^6\,(-406\,c+625\,d\,x)+a^5\,b^2\,d^5\,(959\,c^2-5250\,c\,d\,x+2700\,d^2\,x^2)+5\,a^4\,b^3\,d^4\,(-28\,c^3+875\,c^2\,d\,x-1680\,c\,d^2\,x^2+260\,d^3\,x^3)-5\,a^3\,b^4\,d^3\,(7\,c^4+140\,c^3\,d\,x-1540\,c^2\,d^2\,x^2+1120\,c\,d^3\,x^3+80\,d^4\,x^4)-a^2\,b^5\,d^2\,(14\,c^5+175\,c^4\,d\,x+1400\,c^3\,d^2\,x^2-6300\,c^2\,d^3\,x^3+700\,c\,d^4\,x^4+500\,d^5\,x^5)-7\,a\,b^6\,d\,(c^6+10\,c^5\,d\,x+50\,c^4\,d^2\,x^2+200\,c^3\,d^3\,x^3-300\,c^2\,d^4\,x^4-100\,c\,d^5\,x^5+10\,d^6\,x^6)-b^7\,(4\,c^7+35\,c^6\,d\,x+140\,c^5\,d^2\,x^2+350\,c^4\,d^3\,x^3+700\,c^3\,d^4\,x^4-140\,c\,d^6\,x^6-10\,d^7\,x^7)+420\,d^5\,(b\,c-a\,d)^2\,(a+b\,x)^5\,\mathrm{Log}[a+b\,x]\Big)$$

Problem 1289: Result more than twice size of optimal antiderivative.

$$\int\frac{(c+d\,x)^7}{(a+b\,x)^7}\,dx$$

Optimal (type 3, 186 leaves, 2 steps):

$$\frac{d^7\,x}{b^7}-\frac{(b\,c-a\,d)^7}{6\,b^8\,(a+b\,x)^6}-\frac{7\,d\,(b\,c-a\,d)^6}{5\,b^8\,(a+b\,x)^5}-\frac{21\,d^2\,(b\,c-a\,d)^5}{4\,b^8\,(a+b\,x)^4}-\frac{35\,d^3\,(b\,c-a\,d)^4}{3\,b^8\,(a+b\,x)^3}-\frac{35\,d^4\,(b\,c-a\,d)^3}{2\,b^8\,(a+b\,x)^2}-\frac{21\,d^5\,(b\,c-a\,d)^2}{b^8\,(a+b\,x)}+\frac{7\,d^6\,(b\,c-a\,d)\,\mathrm{Log}[a+b\,x]}{b^8}$$

Result (type 3, 390 leaves):

$$-\frac{1}{60\,b^8\,(a+b\,x)^6}\Big(669\,a^7\,d^7+3\,a^6\,b\,d^6\,(-343\,c+1198\,d\,x)+3\,a^5\,b^2\,d^5\,(70\,c^2-1918\,c\,d\,x+2575\,d^2\,x^2)+5\,a^4\,b^3\,d^4\,(14\,c^3+252\,c^2\,d\,x-2625\,c\,d^2\,x^2+1640\,d^3\,x^3)+5\,a^3\,b^4\,d^3\,(7\,c^4+84\,c^3\,d\,x+630\,c^2\,d^2\,x^2-3080\,c\,d^3\,x^3+810\,d^4\,x^4)+3\,a^2\,b^5\,d^2\,(7\,c^5+70\,c^4\,d\,x+350\,c^3\,d^2\,x^2+1400\,c^2\,d^3\,x^3-3150\,c\,d^4\,x^4+120\,d^5\,x^5)+a\,b^6\,d\,(14\,c^6+126\,c^5\,d\,x+525\,c^4\,d^2\,x^2+1400\,c^3\,d^3\,x^3+3150\,c^2\,d^4\,x^4-2520\,c\,d^5\,x^5-360\,d^6\,x^6)+b^7\,(10\,c^7+84\,c^6\,d\,x+315\,c^5\,d^2\,x^2+700\,c^4\,d^3\,x^3+1050\,c^3\,d^4\,x^4+1260\,c^2\,d^5\,x^5-60\,d^7\,x^7)+420\,d^6\,(-b\,c+a\,d)\,(a+b\,x)^6\,\mathrm{Log}[a+b\,x]\Big)$$

Problem 1291: Result more than twice size of optimal antiderivative.

$$\int\frac{(c+d\,x)^7}{(a+b\,x)^9}\,dx$$

Optimal (type 1, 28 leaves, 1 step):

$$-\frac{(c+d\,x)^8}{8\,(b\,c-a\,d)\,(a+b\,x)^8}$$

Result (type 1, 353 leaves):

$$-\frac{1}{8\,b^8\,(a+b\,x)^8}\Big(a^7\,d^7+a^6\,b\,d^6\,(c+8\,d\,x)+a^5\,b^2\,d^5\,(c^2+8\,c\,d\,x+28\,d^2\,x^2)+a^4\,b^3\,d^4\,(c^3+8\,c^2\,d\,x+28\,c\,d^2\,x^2+56\,d^3\,x^3)+a^3\,b^4\,d^3\,(c^4+8\,c^3\,d\,x+28\,c^2\,d^2\,x^2+56\,c\,d^3\,x^3+70\,d^4\,x^4)+a^2\,b^5\,d^2\,(c^5+8\,c^4\,d\,x+28\,c^3\,d^2\,x^2+56\,c^2\,d^3\,x^3+70\,c\,d^4\,x^4+56\,d^5\,x^5)+a\,b^6\,d\,(c^6+8\,c^5\,d\,x+28\,c^4\,d^2\,x^2+56\,c^3\,d^3\,x^3+70\,c^2\,d^4\,x^4+56\,c\,d^5\,x^5+28\,d^6\,x^6)+b^7\,(c^7+8\,c^6\,d\,x+28\,c^5\,d^2\,x^2+56\,c^4\,d^3\,x^3+70\,c^3\,d^4\,x^4+56\,c^2\,d^5\,x^5+28\,c\,d^6\,x^6+8\,d^7\,x^7)\Big)$$

Problem 1292: Result more than twice size of optimal antiderivative.

$$\int\frac{(c+d\,x)^7}{(a+b\,x)^{10}}\,dx$$

Optimal (type 1, 58 leaves, 2 steps):

$$-\frac{(c+d\,x)^8}{9\,(b\,c-a\,d)\,(a+b\,x)^9}+\frac{d\,(c+d\,x)^8}{72\,(b\,c-a\,d)^2\,(a+b\,x)^8}$$

Result (type 1, 367 leaves):

$$-\frac{1}{72\,b^8\,(a+b\,x)^9}\Big(a^7\,d^7+a^6\,b\,d^6\,(2\,c+9\,d\,x)+3\,a^5\,b^2\,d^5\,(c^2+6\,c\,d\,x+12\,d^2\,x^2)+a^4\,b^3\,d^4\,(4\,c^3+27\,c^2\,d\,x+72\,c\,d^2\,x^2+84\,d^3\,x^3)+a^3\,b^4\,d^3\,(5\,c^4+36\,c^3\,d\,x+108\,c^2\,d^2\,x^2+168\,c\,d^3\,x^3+126\,d^4\,x^4)+3\,a^2\,b^5\,d^2\,(2\,c^5+15\,c^4\,d\,x+48\,c^3\,d^2\,x^2+84\,c^2\,d^3\,x^3+84\,c\,d^4\,x^4+42\,d^5\,x^5)+a\,b^6\,d\,(7\,c^6+54\,c^5\,d\,x+180\,c^4\,d^2\,x^2+336\,c^3\,d^3\,x^3+378\,c^2\,d^4\,x^4+252\,c\,d^5\,x^5+84\,d^6\,x^6)+b^7\,(8\,c^7+63\,c^6\,d\,x+216\,c^5\,d^2\,x^2+420\,c^4\,d^3\,x^3+504\,c^3\,d^4\,x^4+378\,c^2\,d^5\,x^5+168\,c\,d^6\,x^6+36\,d^7\,x^7)\Big)$$

Problem 1293: Result more than twice size of optimal antiderivative.

$$\int \frac{(c+d x)^7}{(a+b x)^{11}} \, dx$$

Optimal (type 1, 89 leaves, 3 steps):

$$-\frac{(c+d x)^8}{10 (b c-a d) (a+b x)^{10}}+\frac{d (c+d x)^8}{45 (b c-a d)^2 (a+b x)^9}-\frac{d^2 (c+d x)^8}{360 (b c-a d)^3 (a+b x)^8}$$

Result (type 1, 371 leaves):

$$-\frac{1}{360 b^8 (a+b x)^{10}}\left(a^7 d^7+a^6 b d^6 (3 c+10 d x)+3 a^5 b^2 d^5 \left(2 c^2+10 c d x+15 d^2 x^2\right)+5 a^4 b^3 d^4 \left(2 c^3+12 c^2 d x+27 c d^2 x^2+24 d^3 x^3\right)+5 a^3 b^4 d^3 \left(3 c^4+20 c^3 d x+54 c^2 d^2 x^2+72 c d^3 x^3+42 d^4 x^4\right)+3 a^2 b^5 d^2 \left(7 c^5+50 c^4 d x+150 c^3 d^2 x^2+240 c^2 d^3 x^3+210 c d^4 x^4+84 d^5 x^5\right)+a b^6 d \left(28 c^6+210 c^5 d x+675 c^4 d^2 x^2+1200 c^3 d^3 x^3+1260 c^2 d^4 x^4+756 c d^5 x^5+210 d^6 x^6\right)+b^7 \left(36 c^7+280 c^6 d x+945 c^5 d^2 x^2+1800 c^4 d^3 x^3+2100 c^3 d^4 x^4+1512 c^2 d^5 x^5+630 c d^6 x^6+120 d^7 x^7\right)\right)$$

Problem 1294: Result more than twice size of optimal antiderivative.

$$\int \frac{(c+d x)^7}{(a+b x)^{12}} \, dx$$

Optimal (type 1, 120 leaves, 4 steps):

$$-\frac{(c+d x)^8}{11 (b c-a d) (a+b x)^{11}}+\frac{3 d (c+d x)^8}{110 (b c-a d)^2 (a+b x)^{10}}-\frac{d^2 (c+d x)^8}{165 (b c-a d)^3 (a+b x)^9}+\frac{d^3 (c+d x)^8}{1320 (b c-a d)^4 (a+b x)^8}$$

Result (type 1, 369 leaves):

$$-\frac{1}{1320 b^8 (a+b x)^{11}}\left(a^7 d^7+a^6 b d^6 (4 c+11 d x)+a^5 b^2 d^5 \left(10 c^2+44 c d x+55 d^2 x^2\right)+5 a^4 b^3 d^4 \left(4 c^3+22 c^2 d x+44 c d^2 x^2+33 d^3 x^3\right)+5 a^3 b^4 d^3 \left(7 c^4+44 c^3 d x+110 c^2 d^2 x^2+132 c d^3 x^3+66 d^4 x^4\right)+a^2 b^5 d^2 \left(56 c^5+385 c^4 d x+1100 c^3 d^2 x^2+1650 c^2 d^3 x^3+1320 c d^4 x^4+462 d^5 x^5\right)+a b^6 d \left(84 c^6+616 c^5 d x+1925 c^4 d^2 x^2+3300 c^3 d^3 x^3+3300 c^2 d^4 x^4+1848 c d^5 x^5+462 d^6 x^6\right)+b^7 \left(120 c^7+924 c^6 d x+3080 c^5 d^2 x^2+5775 c^4 d^3 x^3+6600 c^3 d^4 x^4+4620 c^2 d^5 x^5+1848 c d^6 x^6+330 d^7 x^7\right)\right)$$

Problem 1295: Result more than twice size of optimal antiderivative.

$$\int \frac{(c+d x)^7}{(a+b x)^{13}} \, dx$$

Optimal (type 1, 151 leaves, 5 steps):

$$-\frac{(c+d x)^8}{12 (b c-a d) (a+b x)^{12}}+\frac{d (c+d x)^8}{33 (b c-a d)^2 (a+b x)^{11}}-\frac{d^2 (c+d x)^8}{110 (b c-a d)^3 (a+b x)^{10}}+\frac{d^3 (c+d x)^8}{495 (b c-a d)^4 (a+b x)^9}-\frac{d^4 (c+d x)^8}{3960 (b c-a d)^5 (a+b x)^8}$$

Result (type 1, 371 leaves):

$$-\frac{1}{3960 b^8 (a+b x)^{12}} \left(a^7 d^7+a^6 b d^6 (5 c+12 d x)+3 a^5 b^2 d^5 \left(5 c^2+20 c d x+22 d^2 x^2\right)+5 a^4 b^3 d^4 \left(7 c^3+36 c^2 d x+66 c d^2 x^2+44 d^3 x^3\right)+5 a^3 b^4 d^3 \left(14 c^4+84 c^3 d x+198 c^2 d^2 x^2+220 c d^3 x^3+99 d^4 x^4\right)+3 a^2 b^5 d^2 \left(42 c^5+280 c^4 d x+770 c^3 d^2 x^2+1100 c^2 d^3 x^3+825 c d^4 x^4+264 d^5 x^5\right)+a b^6 d \left(210 c^6+1512 c^5 d x+4620 c^4 d^2 x^2+7700 c^3 d^3 x^3+7425 c^2 d^4 x^4+3960 c d^5 x^5+924 d^6 x^6\right)+b^7 \left(330 c^7+2520 c^6 d x+8316 c^5 d^2 x^2+15400 c^4 d^3 x^3+17325 c^3 d^4 x^4+11880 c^2 d^5 x^5+4620 c d^6 x^6+792 d^7 x^7\right)\right)$$

Problem 1299: Result more than twice size of optimal antiderivative.

$$\int (a+b x)^{12} (c+d x)^{10} \, dx$$

Optimal (type 1, 275 leaves, 2 steps):

$$\frac{(b c-a d)^{10} (a+b x)^{13}}{13 b^{11}}+\frac{5 d (b c-a d)^9 (a+b x)^{14}}{7 b^{11}}+\frac{3 d^2 (b c-a d)^8 (a+b x)^{15}}{b^{11}}+\frac{15 d^3 (b c-a d)^7 (a+b x)^{16}}{2 b^{11}}+\frac{210 d^4 (b c-a d)^6 (a+b x)^{17}}{17 b^{11}}+\frac{14 d^5 (b c-a d)^5 (a+b x)^{18}}{b^{11}}+\frac{210 d^6 (b c-a d)^4 (a+b x)^{19}}{19 b^{11}}+\frac{6 d^7 (b c-a d)^3 (a+b x)^{20}}{b^{11}}+\frac{15 d^8 (b c-a d)^2 (a+b x)^{21}}{7 b^{11}}+\frac{5 d^9 (b c-a d) (a+b x)^{22}}{11 b^{11}}+\frac{d^{10} (a+b x)^{23}}{23 b^{11}}$$

Result (type 1, 1817 leaves):

$$a^{12} c^{10} x + a^{11} c^9 (6 b c + 5 a d) x^2 + a^{10} c^8 (22 b^2 c^2 + 40 a b c d + 15 a^2 d^2) x^3 +$$
$$5 a^9 c^7 (11 b^3 c^3 + 33 a b^2 c^2 d + 27 a^2 b c d^2 + 6 a^3 d^3) x^4 +$$
$$a^8 c^6 (99 b^4 c^4 + 440 a b^3 c^3 d + 594 a^2 b^2 c^2 d^2 + 288 a^3 b c d^3 + 42 a^4 d^4) x^5 +$$
$$3 a^7 c^5 (44 b^5 c^5 + 275 a b^4 c^4 d + 550 a^2 b^3 c^3 d^2 + 440 a^3 b^2 c^2 d^3 + 140 a^4 b c d^4 + 14 a^5 d^5) x^6 +$$
$$\frac{3}{7} a^6 c^4 (308 b^6 c^6 + 2640 a b^5 c^5 d + 7425 a^2 b^4 c^4 d^2 + 8800 a^3 b^3 c^3 d^3 + 4620 a^4 b^2 c^2 d^4 +$$
$$1008 a^5 b c d^5 + 70 a^6 d^6) x^7 + 3 a^5 c^3 (33 b^7 c^7 + 385 a b^6 c^6 d + 1485 a^2 b^5 c^5 d^2 +$$
$$2475 a^3 b^4 c^4 d^3 + 1925 a^4 b^3 c^3 d^4 + 693 a^5 b^2 c^2 d^5 + 105 a^6 b c d^6 + 5 a^7 d^7) x^8 +$$
$$5 a^4 c^2 (11 b^8 c^8 + 176 a b^7 c^7 d + 924 a^2 b^6 c^6 d^2 + 2112 a^3 b^5 c^5 d^3 + 2310 a^4 b^4 c^4 d^4 +$$
$$1232 a^5 b^3 c^3 d^5 + 308 a^6 b^2 c^2 d^6 + 32 a^7 b c d^7 + a^8 d^8) x^9 +$$
$$a^3 c (22 b^9 c^9 + 495 a b^8 c^8 d + 3564 a^2 b^7 c^7 d^2 + 11088 a^3 b^6 c^6 d^3 + 16632 a^4 b^5 c^5 d^4 +$$
$$12474 a^5 b^4 c^4 d^5 + 4620 a^6 b^3 c^3 d^6 + 792 a^7 b^2 c^2 d^7 + 54 a^8 b c d^8 + a^9 d^9) x^{10} +$$
$$\frac{1}{11} a^2 (66 b^{10} c^{10} + 2200 a b^9 c^9 d + 22275 a^2 b^8 c^8 d^2 + 95040 a^3 b^7 c^7 d^3 + 194040 a^4 b^6 c^6 d^4 +$$
$$199584 a^5 b^5 c^5 d^5 + 103950 a^6 b^4 c^4 d^6 + 26400 a^7 b^3 c^3 d^7 + 2970 a^8 b^2 c^2 d^8 + 120 a^9 b c d^9 + a^{10} d^{10})$$
$$x^{11} + a b (b^{10} c^{10} + 55 a b^9 c^9 d + 825 a^2 b^8 c^8 d^2 + 4950 a^3 b^7 c^7 d^3 + 13860 a^4 b^6 c^6 d^4 + 19404 a^5 b^5 c^5 d^5 +$$
$$13860 a^6 b^4 c^4 d^6 + 4950 a^7 b^3 c^3 d^7 + 825 a^8 b^2 c^2 d^8 + 55 a^9 b c d^9 + a^{10} d^{10}) x^{12} + \frac{1}{13} b^2$$
$$(b^{10} c^{10} + 120 a b^9 c^9 d + 2970 a^2 b^8 c^8 d^2 + 26400 a^3 b^7 c^7 d^3 + 103950 a^4 b^6 c^6 d^4 + 199584 a^5 b^5 c^5 d^5 +$$
$$194040 a^6 b^4 c^4 d^6 + 95040 a^7 b^3 c^3 d^7 + 22275 a^8 b^2 c^2 d^8 + 2200 a^9 b c d^9 + 66 a^{10} d^{10}) x^{13} +$$
$$\frac{5}{7} b^3 d (b^9 c^9 + 54 a b^8 c^8 d + 792 a^2 b^7 c^7 d^2 + 4620 a^3 b^6 c^6 d^3 + 12474 a^4 b^5 c^5 d^4 +$$
$$16632 a^5 b^4 c^4 d^5 + 11088 a^6 b^3 c^3 d^6 + 3564 a^7 b^2 c^2 d^7 + 495 a^8 b c d^8 + 22 a^9 d^9) x^{14} +$$
$$3 b^4 d^2 (b^8 c^8 + 32 a b^7 c^7 d + 308 a^2 b^6 c^6 d^2 + 1232 a^3 b^5 c^5 d^3 + 2310 a^4 b^4 c^4 d^4 +$$
$$2112 a^5 b^3 c^3 d^5 + 924 a^6 b^2 c^2 d^6 + 176 a^7 b c d^7 + 11 a^8 d^8) x^{15} +$$
$$\frac{3}{2} b^5 d^3 (5 b^7 c^7 + 105 a b^6 c^6 d + 693 a^2 b^5 c^5 d^2 + 1925 a^3 b^4 c^4 d^3 + 2475 a^4 b^3 c^3 d^4 +$$
$$1485 a^5 b^2 c^2 d^5 + 385 a^6 b c d^6 + 33 a^7 d^7) x^{16} + \frac{3}{17} b^6 d^4 (70 b^6 c^6 + 1008 a b^5 c^5 d +$$
$$4620 a^2 b^4 c^4 d^2 + 8800 a^3 b^3 c^3 d^3 + 7425 a^4 b^2 c^2 d^4 + 2640 a^5 b c d^5 + 308 a^6 d^6) x^{17} +$$
$$b^7 d^5 (14 b^5 c^5 + 140 a b^4 c^4 d + 440 a^2 b^3 c^3 d^2 + 550 a^3 b^2 c^2 d^3 + 275 a^4 b c d^4 + 44 a^5 d^5) x^{18} +$$
$$\frac{5}{19} b^8 d^6 (42 b^4 c^4 + 288 a b^3 c^3 d + 594 a^2 b^2 c^2 d^2 + 440 a^3 b c d^3 + 99 a^4 d^4) x^{19} +$$
$$b^9 d^7 (6 b^3 c^3 + 27 a b^2 c^2 d + 33 a^2 b c d^2 + 11 a^3 d^3) x^{20} +$$
$$\frac{1}{7} b^{10} d^8 (15 b^2 c^2 + 40 a b c d + 22 a^2 d^2) x^{21} +$$
$$\frac{1}{11} b^{11} d^9 (5 b c + 6 a d) x^{22} + \frac{1}{23} b^{12} d^{10} x^{23}$$

Problem 1300: Result more than twice size of optimal antiderivative.

$$\int (a + b x)^{11} (c + d x)^{10} \, dx$$

Optimal (type 1, 279 leaves, 2 steps):

$$\frac{(b\,c-a\,d)^{10}\,(a+b\,x)^{12}}{12\,b^{11}}+\frac{10\,d\,(b\,c-a\,d)^{9}\,(a+b\,x)^{13}}{13\,b^{11}}+\frac{45\,d^{2}\,(b\,c-a\,d)^{8}\,(a+b\,x)^{14}}{14\,b^{11}}+\frac{8\,d^{3}\,(b\,c-a\,d)^{7}\,(a+b\,x)^{15}}{b^{11}}+\frac{105\,d^{4}\,(b\,c-a\,d)^{6}\,(a+b\,x)^{16}}{8\,b^{11}}+\frac{252\,d^{5}\,(b\,c-a\,d)^{5}\,(a+b\,x)^{17}}{17\,b^{11}}+\frac{35\,d^{6}\,(b\,c-a\,d)^{4}\,(a+b\,x)^{18}}{3\,b^{11}}+\frac{120\,d^{7}\,(b\,c-a\,d)^{3}\,(a+b\,x)^{19}}{19\,b^{11}}+\frac{9\,d^{8}\,(b\,c-a\,d)^{2}\,(a+b\,x)^{20}}{4\,b^{11}}+\frac{10\,d^{9}\,(b\,c-a\,d)\,(a+b\,x)^{21}}{21\,b^{11}}+\frac{d^{10}\,(a+b\,x)^{22}}{22\,b^{11}}$$

Result (type 1, 1702 leaves) :

$$a^{11} c^{10} x + \frac{1}{2} a^{10} c^9 \left(11 b c + 10 a d\right) x^2 + \frac{5}{3} a^9 c^8 \left(11 b^2 c^2 + 22 a b c d + 9 a^2 d^2\right) x^3 + \frac{5}{4} a^8 c^7 \left(33 b^3 c^3 + 110 a b^2 c^2 d + 99 a^2 b c d^2 + 24 a^3 d^3\right) x^4 + 3 a^7 c^6 \left(22 b^4 c^4 + 110 a b^3 c^3 d + 165 a^2 b^2 c^2 d^2 + 88 a^3 b c d^3 + 14 a^4 d^4\right) x^5 + \frac{1}{2} a^6 c^5 \left(154 b^5 c^5 + 1100 a b^4 c^4 d + 2475 a^2 b^3 c^3 d^2 + 2200 a^3 b^2 c^2 d^3 + 770 a^4 b c d^4 + 84 a^5 d^5\right) x^6 + \frac{6}{7} a^5 c^4 \left(77 b^6 c^6 + 770 a b^5 c^5 d + 2475 a^2 b^4 c^4 d^2 + 3300 a^3 b^3 c^3 d^3 + 1925 a^4 b^2 c^2 d^4 + 462 a^5 b c d^5 + 35 a^6 d^6\right) x^7 + \frac{15}{4} a^4 c^3 \left(11 b^7 c^7 + 154 a b^6 c^6 d + 693 a^2 b^5 c^5 d^2 + 1320 a^3 b^4 c^4 d^3 + 1155 a^4 b^3 c^3 d^4 + 462 a^5 b^2 c^2 d^5 + 77 a^6 b c d^6 + 4 a^7 d^7\right) x^8 + \frac{5}{3} a^3 c^2 \left(11 b^8 c^8 + 220 a b^7 c^7 d + 1386 a^2 b^6 c^6 d^2 + 3696 a^3 b^5 c^5 d^3 + 4620 a^4 b^4 c^4 d^4 + 2772 a^5 b^3 c^3 d^5 + 770 a^6 b^2 c^2 d^6 + 88 a^7 b c d^7 + 3 a^8 d^8\right) x^9 + \frac{1}{2} a^2 c \left(11 b^9 c^9 + 330 a b^8 c^8 d + 2970 a^2 b^7 c^7 d^2 + 11088 a^3 b^6 c^6 d^3 + 19404 a^4 b^5 c^5 d^4 + 16632 a^5 b^4 c^4 d^5 + 6930 a^6 b^3 c^3 d^6 + 1320 a^7 b^2 c^2 d^7 + 99 a^8 b c d^8 + 2 a^9 d^9\right) x^{10} + \frac{1}{11} a \left(11 b^{10} c^{10} + 550 a b^9 c^9 d + 7425 a^2 b^8 c^8 d^2 + 39600 a^3 b^7 c^7 d^3 + 97020 a^4 b^6 c^6 d^4 + 116424 a^5 b^5 c^5 d^5 + 69300 a^6 b^4 c^4 d^6 + 19800 a^7 b^3 c^3 d^7 + 2475 a^8 b^2 c^2 d^8 + 110 a^9 b c d^9 + a^{10} d^{10}\right) x^{11} + \frac{1}{12} b \left(b^{10} c^{10} + 110 a b^9 c^9 d + 2475 a^2 b^8 c^8 d^2 + 19800 a^3 b^7 c^7 d^3 + 69300 a^4 b^6 c^6 d^4 + 116424 a^5 b^5 c^5 d^5 + 97020 a^6 b^4 c^4 d^6 + 39600 a^7 b^3 c^3 d^7 + 7425 a^8 b^2 c^2 d^8 + 550 a^9 b c d^9 + 11 a^{10} d^{10}\right) x^{12} + \frac{5}{13} b^2 d \left(2 b^9 c^9 + 99 a b^8 c^8 d + 1320 a^2 b^7 c^7 d^2 + 6930 a^3 b^6 c^6 d^3 + 16632 a^4 b^5 c^5 d^4 + 19404 a^5 b^4 c^4 d^5 + 11088 a^6 b^3 c^3 d^6 + 2970 a^7 b^2 c^2 d^7 + 330 a^8 b c d^8 + 11 a^9 d^9\right) x^{13} + \frac{15}{14} b^3 d^2 \left(3 b^8 c^8 + 88 a b^7 c^7 d + 770 a^2 b^6 c^6 d^2 + 2772 a^3 b^5 c^5 d^3 + 4620 a^4 b^4 c^4 d^4 + 3696 a^5 b^3 c^3 d^5 + 1386 a^6 b^2 c^2 d^6 + 220 a^7 b c d^7 + 11 a^8 d^8\right) x^{14} + 2 b^4 d^3 \left(4 b^7 c^7 + 77 a b^6 c^6 d + 462 a^2 b^5 c^5 d^2 + 1155 a^3 b^4 c^4 d^3 + 1320 a^4 b^3 c^3 d^4 + 693 a^5 b^2 c^2 d^5 + 154 a^6 b c d^6 + 11 a^7 d^7\right) x^{15} + \frac{3}{8} b^5 d^4 \left(35 b^6 c^6 + 462 a b^5 c^5 d + 1925 a^2 b^4 c^4 d^2 + 3300 a^3 b^3 c^3 d^3 + 2475 a^4 b^2 c^2 d^4 + 770 a^5 b c d^5 + 77 a^6 d^6\right) x^{16} + \frac{3}{17} b^6 d^5 \left(84 b^5 c^5 + 770 a b^4 c^4 d + 2200 a^2 b^3 c^3 d^2 + 2475 a^3 b^2 c^2 d^3 + 1100 a^4 b c d^4 + 154 a^5 d^5\right) x^{17} + \frac{5}{6} b^7 d^6 \left(14 b^4 c^4 + 88 a b^3 c^3 d + 165 a^2 b^2 c^2 d^2 + 110 a^3 b c d^3 + 22 a^4 d^4\right) x^{18} + \frac{5}{19} b^8 d^7 \left(24 b^3 c^3 + 99 a b^2 c^2 d + 110 a^2 b c d^2 + 33 a^3 d^3\right) x^{19} + \frac{1}{4} b^9 d^8 \left(9 b^2 c^2 + 22 a b c d + 11 a^2 d^2\right) x^{20} + \frac{1}{21} b^{10} d^9 \left(10 b c + 11 a d\right) x^{21} + \frac{1}{22} b^{11} d^{10} x^{22}$$

Problem 1301: Result more than twice size of optimal antiderivative.

$$\int (a+b x)^{10} (c+d x)^{10} \, dx$$

Optimal (type 1, 279 leaves, 2 steps):

$$\frac{(b c-a d)^{10} (a+b x)^{11}}{11 b^{11}}+\frac{5 d (b c-a d)^9 (a+b x)^{12}}{6 b^{11}}+\frac{45 d^2 (b c-a d)^8 (a+b x)^{13}}{13 b^{11}}+\frac{60 d^3 (b c-a d)^7 (a+b x)^{14}}{7 b^{11}}+\frac{14 d^4 (b c-a d)^6 (a+b x)^{15}}{b^{11}}+\frac{63 d^5 (b c-a d)^5 (a+b x)^{16}}{4 b^{11}}+\frac{210 d^6 (b c-a d)^4 (a+b x)^{17}}{17 b^{11}}+\frac{20 d^7 (b c-a d)^3 (a+b x)^{18}}{3 b^{11}}+\frac{45 d^8 (b c-a d)^2 (a+b x)^{19}}{19 b^{11}}+\frac{d^9 (b c-a d) (a+b x)^{20}}{2 b^{11}}+\frac{d^{10} (a+b x)^{21}}{21 b^{11}}$$

Result (type 1, 1539 leaves):

$$a^{10} c^{10} x + 5 a^9 c^9 (b c + a d) x^2 + \frac{5}{3} a^8 c^8 (9 b^2 c^2 + 20 a b c d + 9 a^2 d^2) x^3 + \frac{15}{2} a^7 c^7 (4 b^3 c^3 + 15 a b^2 c^2 d + 15 a^2 b c d^2 + 4 a^3 d^3) x^4 + 3 a^6 c^6 (14 b^4 c^4 + 80 a b^3 c^3 d + 135 a^2 b^2 c^2 d^2 + 80 a^3 b c d^3 + 14 a^4 d^4) x^5 + 2 a^5 c^5 (21 b^5 c^5 + 175 a b^4 c^4 d + 450 a^2 b^3 c^3 d^2 + 450 a^3 b^2 c^2 d^3 + 175 a^4 b c d^4 + 21 a^5 d^5) x^6 + \frac{30}{7} a^4 c^4 (7 b^6 c^6 + 84 a b^5 c^5 d + 315 a^2 b^4 c^4 d^2 + 480 a^3 b^3 c^3 d^3 + 315 a^4 b^2 c^2 d^4 + 84 a^5 b c d^5 + 7 a^6 d^6) x^7 + \frac{15}{2} a^3 c^3 (2 b^7 c^7 + 35 a b^6 c^6 d + 189 a^2 b^5 c^5 d^2 + 420 a^3 b^4 c^4 d^3 + 420 a^4 b^3 c^3 d^4 + 189 a^5 b^2 c^2 d^5 + 35 a^6 b c d^6 + 2 a^7 d^7) x^8 + \frac{5}{3} a^2 c^2 (3 b^8 c^8 + 80 a b^7 c^7 d + 630 a^2 b^6 c^6 d^2 + 2016 a^3 b^5 c^5 d^3 + 2940 a^4 b^4 c^4 d^4 + 2016 a^5 b^3 c^3 d^5 + 630 a^6 b^2 c^2 d^6 + 80 a^7 b c d^7 + 3 a^8 d^8) x^9 + a c (b^9 c^9 + 45 a b^8 c^8 d + 540 a^2 b^7 c^7 d^2 + 2520 a^3 b^6 c^6 d^3 + 5292 a^4 b^5 c^5 d^4 + 5292 a^5 b^4 c^4 d^5 + 2520 a^6 b^3 c^3 d^6 + 540 a^7 b^2 c^2 d^7 + 45 a^8 b c d^8 + a^9 d^9) x^{10} + \frac{1}{11} (b^{10} c^{10} + 100 a b^9 c^9 d + 2025 a^2 b^8 c^8 d^2 + 14400 a^3 b^7 c^7 d^3 + 44100 a^4 b^6 c^6 d^4 + 63504 a^5 b^5 c^5 d^5 + 44100 a^6 b^4 c^4 d^6 + 14400 a^7 b^3 c^3 d^7 + 2025 a^8 b^2 c^2 d^8 + 100 a^9 b c d^9 + a^{10} d^{10}) x^{11} + \frac{5}{6} b d (b^9 c^9 + 45 a b^8 c^8 d + 540 a^2 b^7 c^7 d^2 + 2520 a^3 b^6 c^6 d^3 + 5292 a^4 b^5 c^5 d^4 + 5292 a^5 b^4 c^4 d^5 + 2520 a^6 b^3 c^3 d^6 + 540 a^7 b^2 c^2 d^7 + 45 a^8 b c d^8 + a^9 d^9) x^{12} + \frac{15}{13} b^2 d^2 (3 b^8 c^8 + 80 a b^7 c^7 d + 630 a^2 b^6 c^6 d^2 + 2016 a^3 b^5 c^5 d^3 + 2940 a^4 b^4 c^4 d^4 + 2016 a^5 b^3 c^3 d^5 + 630 a^6 b^2 c^2 d^6 + 80 a^7 b c d^7 + 3 a^8 d^8) x^{13} + \frac{30}{7} b^3 d^3 (2 b^7 c^7 + 35 a b^6 c^6 d + 189 a^2 b^5 c^5 d^2 + 420 a^3 b^4 c^4 d^3 + 420 a^4 b^3 c^3 d^4 + 189 a^5 b^2 c^2 d^5 + 35 a^6 b c d^6 + 2 a^7 d^7) x^{14} + 2 b^4 d^4 (7 b^6 c^6 + 84 a b^5 c^5 d + 315 a^2 b^4 c^4 d^2 + 480 a^3 b^3 c^3 d^3 + 315 a^4 b^2 c^2 d^4 + 84 a^5 b c d^5 + 7 a^6 d^6) x^{15} + \frac{3}{4} b^5 d^5 (21 b^5 c^5 + 175 a b^4 c^4 d + 450 a^2 b^3 c^3 d^2 + 450 a^3 b^2 c^2 d^3 + 175 a^4 b c d^4 + 21 a^5 d^5) x^{16} + \frac{15}{17} b^6 d^6 (14 b^4 c^4 + 80 a b^3 c^3 d + 135 a^2 b^2 c^2 d^2 + 80 a^3 b c d^3 + 14 a^4 d^4) x^{17} + \frac{5}{3} b^7 d^7 (4 b^3 c^3 + 15 a b^2 c^2 d + 15 a^2 b c d^2 + 4 a^3 d^3) x^{18} + \frac{5}{19} b^8 d^8 (9 b^2 c^2 + 20 a b c d + 9 a^2 d^2) x^{19} + \frac{1}{2} b^9 d^9 (b c + a d) x^{20} + \frac{1}{21} b^{10} d^{10} x^{21}$$

Problem 1302: Result more than twice size of optimal antiderivative.

$$\int (a + b x)^9 (c + d x)^{10} \, dx$$

Optimal (type 1, 250 leaves, 2 steps):

$$-\frac{(b c-a d)^9 (c+d x)^{11}}{11 d^{10}}+\frac{3 b (b c-a d)^8 (c+d x)^{12}}{4 d^{10}}-\frac{36 b^2 (b c-a d)^7 (c+d x)^{13}}{13 d^{10}}+\frac{6 b^3 (b c-a d)^6 (c+d x)^{14}}{d^{10}}-\frac{42 b^4 (b c-a d)^5 (c+d x)^{15}}{5 d^{10}}+\frac{63 b^5 (b c-a d)^4 (c+d x)^{16}}{8 d^{10}}-\frac{84 b^6 (b c-a d)^3 (c+d x)^{17}}{17 d^{10}}+\frac{2 b^7 (b c-a d)^2 (c+d x)^{18}}{d^{10}}-\frac{9 b^8 (b c-a d) (c+d x)^{19}}{19 d^{10}}+\frac{b^9 (c+d x)^{20}}{20 d^{10}}$$

Result (type 1, 1397 leaves):

$$a^9 c^{10} x+\frac{1}{2} a^8 c^9 (9 b c+10 a d) x^2+3 a^7 c^8 \left(4 b^2 c^2+10 a b c d+5 a^2 d^2\right) x^3+\frac{3}{4} a^6 c^7 \left(28 b^3 c^3+120 a b^2 c^2 d+135 a^2 b c d^2+40 a^3 d^3\right) x^4+\frac{6}{5} a^5 c^6 \left(21 b^4 c^4+140 a b^3 c^3 d+270 a^2 b^2 c^2 d^2+180 a^3 b c d^3+35 a^4 d^4\right) x^5+3 a^4 c^5 \left(7 b^5 c^5+70 a b^4 c^4 d+210 a^2 b^3 c^3 d^2+240 a^3 b^2 c^2 d^3+105 a^4 b c d^4+14 a^5 d^5\right) x^6+6 a^3 c^4 \left(2 b^6 c^6+30 a b^5 c^5 d+135 a^2 b^4 c^4 d^2+240 a^3 b^3 c^3 d^3+180 a^4 b^2 c^2 d^4+54 a^5 b c d^5+5 a^6 d^6\right) x^7+\frac{3}{4} a^2 c^3 \left(6 b^7 c^7+140 a b^6 c^6 d+945 a^2 b^5 c^5 d^2+2520 a^3 b^4 c^4 d^3+2940 a^4 b^3 c^3 d^4+1512 a^5 b^2 c^2 d^5+315 a^6 b c d^6+20 a^7 d^7\right) x^8+a c^2 \left(b^8 c^8+40 a b^7 c^7 d+420 a^2 b^6 c^6 d^2+1680 a^3 b^5 c^5 d^3+2940 a^4 b^4 c^4 d^4+2352 a^5 b^3 c^3 d^5+840 a^6 b^2 c^2 d^6+120 a^7 b c d^7+5 a^8 d^8\right) x^9+\frac{1}{10} c \left(b^9 c^9+90 a b^8 c^8 d+1620 a^2 b^7 c^7 d^2+10080 a^3 b^6 c^6 d^3+26460 a^4 b^5 c^5 d^4+31752 a^5 b^4 c^4 d^5+17640 a^6 b^3 c^3 d^6+4320 a^7 b^2 c^2 d^7+405 a^8 b c d^8+10 a^9 d^9\right) x^{10}+\frac{1}{11} d \left(10 b^9 c^9+405 a b^8 c^8 d+4320 a^2 b^7 c^7 d^2+17640 a^3 b^6 c^6 d^3+31752 a^4 b^5 c^5 d^4+26460 a^5 b^4 c^4 d^5+10080 a^6 b^3 c^3 d^6+1620 a^7 b^2 c^2 d^7+90 a^8 b c d^8+a^9 d^9\right) x^{11}+\frac{3}{4} b d^2 \left(5 b^8 c^8+120 a b^7 c^7 d+840 a^2 b^6 c^6 d^2+2352 a^3 b^5 c^5 d^3+2940 a^4 b^4 c^4 d^4+1680 a^5 b^3 c^3 d^5+420 a^6 b^2 c^2 d^6+40 a^7 b c d^7+a^8 d^8\right) x^{12}+\frac{6}{13} b^2 d^3 \left(20 b^7 c^7+315 a b^6 c^6 d+1512 a^2 b^5 c^5 d^2+2940 a^3 b^4 c^4 d^3+2520 a^4 b^3 c^3 d^4+945 a^5 b^2 c^2 d^5+140 a^6 b c d^6+6 a^7 d^7\right) x^{13}+3 b^3 d^4 \left(5 b^6 c^6+54 a b^5 c^5 d+180 a^2 b^4 c^4 d^2+240 a^3 b^3 c^3 d^3+135 a^4 b^2 c^2 d^4+30 a^5 b c d^5+2 a^6 d^6\right) x^{14}+\frac{6}{5} b^4 d^5 \left(14 b^5 c^5+105 a b^4 c^4 d+240 a^2 b^3 c^3 d^2+210 a^3 b^2 c^2 d^3+70 a^4 b c d^4+7 a^5 d^5\right) x^{15}+\frac{3}{8} b^5 d^6 \left(35 b^4 c^4+180 a b^3 c^3 d+270 a^2 b^2 c^2 d^2+140 a^3 b c d^3+21 a^4 d^4\right) x^{16}+\frac{3}{17} b^6 d^7 \left(40 b^3 c^3+135 a b^2 c^2 d+120 a^2 b c d^2+28 a^3 d^3\right) x^{17}+\frac{1}{2} b^7 d^8 \left(5 b^2 c^2+10 a b c d+4 a^2 d^2\right) x^{18}+\frac{1}{19} b^8 d^9 (10 b c+9 a d) x^{19}+\frac{1}{20} b^9 d^{10} x^{20}$$

Problem 1303: Result more than twice size of optimal antiderivative.

$$\int (a+b x)^8 (c+d x)^{10} \, dx$$

Optimal (type 1, 225 leaves, 2 steps):

$$\frac{(b c-a d)^8 (c+d x)^{11}}{11 d^9}-\frac{2 b (b c-a d)^7 (c+d x)^{12}}{3 d^9}+\frac{28 b^2 (b c-a d)^6 (c+d x)^{13}}{13 d^9}-\frac{4 b^3 (b c-a d)^5 (c+d x)^{14}}{d^9}+\frac{14 b^4 (b c-a d)^4 (c+d x)^{15}}{3 d^9}-\frac{7 b^5 (b c-a d)^3 (c+d x)^{16}}{2 d^9}+\frac{28 b^6 (b c-a d)^2 (c+d x)^{17}}{17 d^9}-\frac{4 b^7 (b c-a d) (c+d x)^{18}}{9 d^9}+\frac{b^8 (c+d x)^{19}}{19 d^9}$$

Result (type 1, 1241 leaves):

$$a^8 c^{10} x+a^7 c^9 (4 b c+5 a d) x^2+\frac{1}{3} a^6 c^8 \left(28 b^2 c^2+80 a b c d+45 a^2 d^2\right) x^3+2 a^5 c^7 \left(7 b^3 c^3+35 a b^2 c^2 d+45 a^2 b c d^2+15 a^3 d^3\right) x^4+2 a^4 c^6 \left(7 b^4 c^4+56 a b^3 c^3 d+126 a^2 b^2 c^2 d^2+96 a^3 b c d^3+21 a^4 d^4\right) x^5+\frac{14}{3} a^3 c^5 \left(2 b^5 c^5+25 a b^4 c^4 d+90 a^2 b^3 c^3 d^2+120 a^3 b^2 c^2 d^3+60 a^4 b c d^4+9 a^5 d^5\right) x^6+2 a^2 c^4 \left(2 b^6 c^6+40 a b^5 c^5 d+225 a^2 b^4 c^4 d^2+480 a^3 b^3 c^3 d^3+420 a^4 b^2 c^2 d^4+144 a^5 b c d^5+15 a^6 d^6\right) x^7+a c^3 \left(b^7 c^7+35 a b^6 c^6 d+315 a^2 b^5 c^5 d^2+1050 a^3 b^4 c^4 d^3+1470 a^4 b^3 c^3 d^4+882 a^5 b^2 c^2 d^5+210 a^6 b c d^6+15 a^7 d^7\right) x^8+\frac{1}{9} c^2 \left(b^8 c^8+80 a b^7 c^7 d+1260 a^2 b^6 c^6 d^2+6720 a^3 b^5 c^5 d^3+14700 a^4 b^4 c^4 d^4+14112 a^5 b^3 c^3 d^5+5880 a^6 b^2 c^2 d^6+960 a^7 b c d^7+45 a^8 d^8\right) x^9+c d \left(b^8 c^8+36 a b^7 c^7 d+336 a^2 b^6 c^6 d^2+1176 a^3 b^5 c^5 d^3+1764 a^4 b^4 c^4 d^4+1176 a^5 b^3 c^3 d^5+336 a^6 b^2 c^2 d^6+36 a^7 b c d^7+a^8 d^8\right) x^{10}+\frac{1}{11} d^2 \left(45 b^8 c^8+960 a b^7 c^7 d+5880 a^2 b^6 c^6 d^2+14112 a^3 b^5 c^5 d^3+14700 a^4 b^4 c^4 d^4+6720 a^5 b^3 c^3 d^5+1260 a^6 b^2 c^2 d^6+80 a^7 b c d^7+a^8 d^8\right) x^{11}+\frac{2}{3} b d^3 \left(15 b^7 c^7+210 a b^6 c^6 d+882 a^2 b^5 c^5 d^2+1470 a^3 b^4 c^4 d^3+1050 a^4 b^3 c^3 d^4+315 a^5 b^2 c^2 d^5+35 a^6 b c d^6+a^7 d^7\right) x^{12}+\frac{14}{13} b^2 d^4 \left(15 b^6 c^6+144 a b^5 c^5 d+420 a^2 b^4 c^4 d^2+480 a^3 b^3 c^3 d^3+225 a^4 b^2 c^2 d^4+40 a^5 b c d^5+2 a^6 d^6\right) x^{13}+2 b^3 d^5 \left(9 b^5 c^5+60 a b^4 c^4 d+120 a^2 b^3 c^3 d^2+90 a^3 b^2 c^2 d^3+25 a^4 b c d^4+2 a^5 d^5\right) x^{14}+\frac{2}{3} b^4 d^6 \left(21 b^4 c^4+96 a b^3 c^3 d+126 a^2 b^2 c^2 d^2+56 a^3 b c d^3+7 a^4 d^4\right) x^{15}+\frac{1}{2} b^5 d^7 \left(15 b^3 c^3+45 a b^2 c^2 d+35 a^2 b c d^2+7 a^3 d^3\right) x^{16}+\frac{1}{17} b^6 d^8 \left(45 b^2 c^2+80 a b c d+28 a^2 d^2\right) x^{17}+\frac{1}{9} b^7 d^9 (5 b c+4 a d) x^{18}+\frac{1}{19} b^8 d^{10} x^{19}$$

Problem 1304: Result more than twice size of optimal antiderivative.

$$\int (a+b x)^7 (c+d x)^{10}\, dx$$

Optimal (type 1, 200 leaves, 2 steps):

$$-\frac{(b c-a d)^7 (c+d x)^{11}}{11 d^8}+\frac{7 b (b c-a d)^6 (c+d x)^{12}}{12 d^8}-\frac{21 b^2 (b c-a d)^5 (c+d x)^{13}}{13 d^8}+\frac{5 b^3 (b c-a d)^4 (c+d x)^{14}}{2 d^8}-\frac{7 b^4 (b c-a d)^3 (c+d x)^{15}}{3 d^8}+\frac{21 b^5 (b c-a d)^2 (c+d x)^{16}}{16 d^8}-\frac{7 b^6 (b c-a d) (c+d x)^{17}}{17 d^8}+\frac{b^7 (c+d x)^{18}}{18 d^8}$$

Result (type 1, 1105 leaves):

$$a^7 c^{10} x+\frac{1}{2} a^6 c^9 (7 b c+10 a d) x^2+\frac{1}{3} a^5 c^8 \left(21 b^2 c^2+70 a b c d+45 a^2 d^2\right) x^3+\frac{5}{4} a^4 c^7 \left(7 b^3 c^3+42 a b^2 c^2 d+63 a^2 b c d^2+24 a^3 d^3\right) x^4+7 a^3 c^6 \left(b^4 c^4+10 a b^3 c^3 d+27 a^2 b^2 c^2 d^2+24 a^3 b c d^3+6 a^4 d^4\right) x^5+\frac{7}{6} a^2 c^5 \left(3 b^5 c^5+50 a b^4 c^4 d+225 a^2 b^3 c^3 d^2+360 a^3 b^2 c^2 d^3+210 a^4 b c d^4+36 a^5 d^5\right) x^6+a c^4 \left(b^6 c^6+30 a b^5 c^5 d+225 a^2 b^4 c^4 d^2+600 a^3 b^3 c^3 d^3+630 a^4 b^2 c^2 d^4+252 a^5 b c d^5+30 a^6 d^6\right) x^7+\frac{1}{8} c^3 \left(b^7 c^7+70 a b^6 c^6 d+945 a^2 b^5 c^5 d^2+4200 a^3 b^4 c^4 d^3+7350 a^4 b^3 c^3 d^4+5292 a^5 b^2 c^2 d^5+1470 a^6 b c d^6+120 a^7 d^7\right) x^8+\frac{5}{9} c^2 d \left(2 b^7 c^7+63 a b^6 c^6 d+504 a^2 b^5 c^5 d^2+1470 a^3 b^4 c^4 d^3+1764 a^4 b^3 c^3 d^4+882 a^5 b^2 c^2 d^5+168 a^6 b c d^6+9 a^7 d^7\right) x^9+\frac{1}{2} c d^2 \left(9 b^7 c^7+168 a b^6 c^6 d+882 a^2 b^5 c^5 d^2+1764 a^3 b^4 c^4 d^3+1470 a^4 b^3 c^3 d^4+504 a^5 b^2 c^2 d^5+63 a^6 b c d^6+2 a^7 d^7\right) x^{10}+\frac{1}{11} d^3 \left(120 b^7 c^7+1470 a b^6 c^6 d+5292 a^2 b^5 c^5 d^2+7350 a^3 b^4 c^4 d^3+4200 a^4 b^3 c^3 d^4+945 a^5 b^2 c^2 d^5+70 a^6 b c d^6+a^7 d^7\right) x^{11}+\frac{7}{12} b d^4 \left(30 b^6 c^6+252 a b^5 c^5 d+630 a^2 b^4 c^4 d^2+600 a^3 b^3 c^3 d^3+225 a^4 b^2 c^2 d^4+30 a^5 b c d^5+a^6 d^6\right) x^{12}+\frac{7}{13} b^2 d^5 \left(36 b^5 c^5+210 a b^4 c^4 d+360 a^2 b^3 c^3 d^2+225 a^3 b^2 c^2 d^3+50 a^4 b c d^4+3 a^5 d^5\right) x^{13}+\frac{5}{2} b^3 d^6 \left(6 b^4 c^4+24 a b^3 c^3 d+27 a^2 b^2 c^2 d^2+10 a^3 b c d^3+a^4 d^4\right) x^{14}+\frac{1}{3} b^4 d^7 \left(24 b^3 c^3+63 a b^2 c^2 d+42 a^2 b c d^2+7 a^3 d^3\right) x^{15}+\frac{1}{16} b^5 d^8 \left(45 b^2 c^2+70 a b c d+21 a^2 d^2\right) x^{16}+\frac{1}{17} b^6 d^9 (10 b c+7 a d) x^{17}+\frac{1}{18} b^7 d^{10} x^{18}$$

Problem 1305: Result more than twice size of optimal antiderivative.

$$\int (a+b x)^6 (c+d x)^{10} \, dx$$

Optimal (type 1, 170 leaves, 2 steps):

$$\frac{(b c-a d)^6 (c+d x)^{11}}{11 d^7}-\frac{b (b c-a d)^5 (c+d x)^{12}}{2 d^7}+\frac{15 b^2 (b c-a d)^4 (c+d x)^{13}}{13 d^7}-\frac{10 b^3 (b c-a d)^3 (c+d x)^{14}}{7 d^7}+\frac{b^4 (b c-a d)^2 (c+d x)^{15}}{d^7}-\frac{3 b^5 (b c-a d) (c+d x)^{16}}{8 d^7}+\frac{b^6 (c+d x)^{17}}{17 d^7}$$

Result (type 1, 939 leaves):

$$a^6 c^{10} x+a^5 c^9 (3 b c+5 a d) x^2+5 a^4 c^8 \left(b^2 c^2+4 a b c d+3 a^2 d^2\right) x^3+\frac{5}{2} a^3 c^7 \left(2 b^3 c^3+15 a b^2 c^2 d+27 a^2 b c d^2+12 a^3 d^3\right) x^4+a^2 c^6 \left(3 b^4 c^4+40 a b^3 c^3 d+135 a^2 b^2 c^2 d^2+144 a^3 b c d^3+42 a^4 d^4\right) x^5+a c^5 \left(b^5 c^5+25 a b^4 c^4 d+150 a^2 b^3 c^3 d^2+300 a^3 b^2 c^2 d^3+210 a^4 b c d^4+42 a^5 d^5\right) x^6+\frac{1}{7} c^4 \left(b^6 c^6+60 a b^5 c^5 d+675 a^2 b^4 c^4 d^2+2400 a^3 b^3 c^3 d^3+3150 a^4 b^2 c^2 d^4+1512 a^5 b c d^5+210 a^6 d^6\right) x^7+\frac{5}{4} c^3 d \left(b^6 c^6+27 a b^5 c^5 d+180 a^2 b^4 c^4 d^2+420 a^3 b^3 c^3 d^3+378 a^4 b^2 c^2 d^4+126 a^5 b c d^5+12 a^6 d^6\right) x^8+5 c^2 d^2 \left(b^6 c^6+16 a b^5 c^5 d+70 a^2 b^4 c^4 d^2+112 a^3 b^3 c^3 d^3+70 a^4 b^2 c^2 d^4+16 a^5 b c d^5+a^6 d^6\right) x^9+c d^3 \left(12 b^6 c^6+126 a b^5 c^5 d+378 a^2 b^4 c^4 d^2+420 a^3 b^3 c^3 d^3+180 a^4 b^2 c^2 d^4+27 a^5 b c d^5+a^6 d^6\right) x^{10}+\frac{1}{11} d^4 \left(210 b^6 c^6+1512 a b^5 c^5 d+3150 a^2 b^4 c^4 d^2+2400 a^3 b^3 c^3 d^3+675 a^4 b^2 c^2 d^4+60 a^5 b c d^5+a^6 d^6\right) x^{11}+\frac{1}{2} b d^5 \left(42 b^5 c^5+210 a b^4 c^4 d+300 a^2 b^3 c^3 d^2+150 a^3 b^2 c^2 d^3+25 a^4 b c d^4+a^5 d^5\right) x^{12}+\frac{5}{13} b^2 d^6 \left(42 b^4 c^4+144 a b^3 c^3 d+135 a^2 b^2 c^2 d^2+40 a^3 b c d^3+3 a^4 d^4\right) x^{13}+\frac{5}{7} b^3 d^7 \left(12 b^3 c^3+27 a b^2 c^2 d+15 a^2 b c d^2+2 a^3 d^3\right) x^{14}+b^4 d^8 \left(3 b^2 c^2+4 a b c d+a^2 d^2\right) x^{15}+\frac{1}{8} b^5 d^9 (5 b c+3 a d) x^{16}+\frac{1}{17} b^6 d^{10} x^{17}$$

Problem 1306: Result more than twice size of optimal antiderivative.

$$\int (a+b x)^5 (c+d x)^{10} \, dx$$

Optimal (type 1, 146 leaves, 2 steps):

$$-\frac{(b c-a d)^5 (c+d x)^{11}}{11 d^6}+\frac{5 b (b c-a d)^4 (c+d x)^{12}}{12 d^6}-\frac{10 b^2 (b c-a d)^3 (c+d x)^{13}}{13 d^6}+\frac{5 b^3 (b c-a d)^2 (c+d x)^{14}}{7 d^6}-\frac{b^4 (b c-a d) (c+d x)^{15}}{3 d^6}+\frac{b^5 (c+d x)^{16}}{16 d^6}$$

Result (type 1, 811 leaves):

$$a^5 c^{10} x + \frac{5}{2} a^4 c^9 (b c + 2 a d) x^2 + \frac{5}{3} a^3 c^8 (2 b^2 c^2 + 10 a b c d + 9 a^2 d^2) x^3 +$$
$$\frac{5}{4} a^2 c^7 (2 b^3 c^3 + 20 a b^2 c^2 d + 45 a^2 b c d^2 + 24 a^3 d^3) x^4 +$$
$$a c^6 (b^4 c^4 + 20 a b^3 c^3 d + 90 a^2 b^2 c^2 d^2 + 120 a^3 b c d^3 + 42 a^4 d^4) x^5 +$$
$$\frac{1}{6} c^5 (b^5 c^5 + 50 a b^4 c^4 d + 450 a^2 b^3 c^3 d^2 + 1200 a^3 b^2 c^2 d^3 + 1050 a^4 b c d^4 + 252 a^5 d^5) x^6 +$$
$$\frac{5}{7} c^4 d (2 b^5 c^5 + 45 a b^4 c^4 d + 240 a^2 b^3 c^3 d^2 + 420 a^3 b^2 c^2 d^3 + 252 a^4 b c d^4 + 42 a^5 d^5) x^7 +$$
$$\frac{15}{8} c^3 d^2 (3 b^5 c^5 + 40 a b^4 c^4 d + 140 a^2 b^3 c^3 d^2 + 168 a^3 b^2 c^2 d^3 + 70 a^4 b c d^4 + 8 a^5 d^5) x^8 +$$
$$\frac{5}{3} c^2 d^3 (8 b^5 c^5 + 70 a b^4 c^4 d + 168 a^2 b^3 c^3 d^2 + 140 a^3 b^2 c^2 d^3 + 40 a^4 b c d^4 + 3 a^5 d^5) x^9 +$$
$$\frac{1}{2} c d^4 (42 b^5 c^5 + 252 a b^4 c^4 d + 420 a^2 b^3 c^3 d^2 + 240 a^3 b^2 c^2 d^3 + 45 a^4 b c d^4 + 2 a^5 d^5) x^{10} +$$
$$\frac{1}{11} d^5 (252 b^5 c^5 + 1050 a b^4 c^4 d + 1200 a^2 b^3 c^3 d^2 + 450 a^3 b^2 c^2 d^3 + 50 a^4 b c d^4 + a^5 d^5) x^{11} +$$
$$\frac{5}{12} b d^6 (42 b^4 c^4 + 120 a b^3 c^3 d + 90 a^2 b^2 c^2 d^2 + 20 a^3 b c d^3 + a^4 d^4) x^{12} +$$
$$\frac{5}{13} b^2 d^7 (24 b^3 c^3 + 45 a b^2 c^2 d + 20 a^2 b c d^2 + 2 a^3 d^3) x^{13} +$$
$$\frac{5}{14} b^3 d^8 (9 b^2 c^2 + 10 a b c d + 2 a^2 d^2) x^{14} + \frac{1}{3} b^4 d^9 (2 b c + a d) x^{15} + \frac{1}{16} b^5 d^{10} x^{16}$$

Problem 1307: Result more than twice size of optimal antiderivative.

$$\int (a + b x)^4 (c + d x)^{10} \, dx$$

Optimal (type 1, 119 leaves, 2 steps):

$$\frac{(b c - a d)^4 (c + d x)^{11}}{11 d^5} - \frac{b (b c - a d)^3 (c + d x)^{12}}{3 d^5} +$$
$$\frac{6 b^2 (b c - a d)^2 (c + d x)^{13}}{13 d^5} - \frac{2 b^3 (b c - a d) (c + d x)^{14}}{7 d^5} + \frac{b^4 (c + d x)^{15}}{15 d^5}$$

Result (type 1, 660 leaves):

$$a^4 c^{10} x + a^3 c^9 (2 b c + 5 a d) x^2 + \frac{1}{3} a^2 c^8 (6 b^2 c^2 + 40 a b c d + 45 a^2 d^2) x^3 +$$
$$a c^7 (b^3 c^3 + 15 a b^2 c^2 d + 45 a^2 b c d^2 + 30 a^3 d^3) x^4 +$$
$$\frac{1}{5} c^6 (b^4 c^4 + 40 a b^3 c^3 d + 270 a^2 b^2 c^2 d^2 + 480 a^3 b c d^3 + 210 a^4 d^4) x^5 +$$
$$\frac{1}{3} c^5 d (5 b^4 c^4 + 90 a b^3 c^3 d + 360 a^2 b^2 c^2 d^2 + 420 a^3 b c d^3 + 126 a^4 d^4) x^6 +$$
$$\frac{3}{7} c^4 d^2 (15 b^4 c^4 + 160 a b^3 c^3 d + 420 a^2 b^2 c^2 d^2 + 336 a^3 b c d^3 + 70 a^4 d^4) x^7 +$$
$$3 c^3 d^3 (5 b^4 c^4 + 35 a b^3 c^3 d + 63 a^2 b^2 c^2 d^2 + 35 a^3 b c d^3 + 5 a^4 d^4) x^8 +$$
$$\frac{1}{3} c^2 d^4 (70 b^4 c^4 + 336 a b^3 c^3 d + 420 a^2 b^2 c^2 d^2 + 160 a^3 b c d^3 + 15 a^4 d^4) x^9 +$$
$$\frac{1}{5} c d^5 (126 b^4 c^4 + 420 a b^3 c^3 d + 360 a^2 b^2 c^2 d^2 + 90 a^3 b c d^3 + 5 a^4 d^4) x^{10} +$$
$$\frac{1}{11} d^6 (210 b^4 c^4 + 480 a b^3 c^3 d + 270 a^2 b^2 c^2 d^2 + 40 a^3 b c d^3 + a^4 d^4) x^{11} +$$
$$\frac{1}{3} b d^7 (30 b^3 c^3 + 45 a b^2 c^2 d + 15 a^2 b c d^2 + a^3 d^3) x^{12} +$$
$$\frac{1}{13} b^2 d^8 (45 b^2 c^2 + 40 a b c d + 6 a^2 d^2) x^{13} + \frac{1}{7} b^3 d^9 (5 b c + 2 a d) x^{14} + \frac{1}{15} b^4 d^{10} x^{15}$$

Problem 1308: Result more than twice size of optimal antiderivative.

$$\int (a + b x)^3 (c + d x)^{10} \, dx$$

Optimal (type 1, 92 leaves, 2 steps):

$$-\frac{(b c - a d)^3 (c + d x)^{11}}{11 d^4} + \frac{b (b c - a d)^2 (c + d x)^{12}}{4 d^4} - \frac{3 b^2 (b c - a d) (c + d x)^{13}}{13 d^4} + \frac{b^3 (c + d x)^{14}}{14 d^4}$$

Result (type 1, 511 leaves):

$$a^3 c^{10} x+\frac{1}{2} a^2 c^9 (3 b c+10 a d) x^2+a c^8 \left(b^2 c^2+10 a b c d+15 a^2 d^2\right) x^3+\frac{1}{4} c^7 \left(b^3 c^3+30 a b^2 c^2 d+135 a^2 b c d^2+120 a^3 d^3\right) x^4+c^6 d \left(2 b^3 c^3+27 a b^2 c^2 d+72 a^2 b c d^2+42 a^3 d^3\right) x^5+\frac{3}{2} c^5 d^2 \left(5 b^3 c^3+40 a b^2 c^2 d+70 a^2 b c d^2+28 a^3 d^3\right) x^6+\frac{6}{7} c^4 d^3 \left(20 b^3 c^3+105 a b^2 c^2 d+126 a^2 b c d^2+35 a^3 d^3\right) x^7+\frac{3}{4} c^3 d^4 \left(35 b^3 c^3+126 a b^2 c^2 d+105 a^2 b c d^2+20 a^3 d^3\right) x^8+c^2 d^5 \left(28 b^3 c^3+70 a b^2 c^2 d+40 a^2 b c d^2+5 a^3 d^3\right) x^9+\frac{1}{2} c d^6 \left(42 b^3 c^3+72 a b^2 c^2 d+27 a^2 b c d^2+2 a^3 d^3\right) x^{10}+\frac{1}{11} d^7 \left(120 b^3 c^3+135 a b^2 c^2 d+30 a^2 b c d^2+a^3 d^3\right) x^{11}+\frac{1}{4} b d^8 \left(15 b^2 c^2+10 a b c d+a^2 d^2\right) x^{12}+\frac{1}{13} b^2 d^9 (10 b c+3 a d) x^{13}+\frac{1}{14} b^3 d^{10} x^{14}$$

Problem 1309: Result more than twice size of optimal antiderivative.

$$\int (a+b x)^2 (c+d x)^{10} \, dx$$

Optimal (type 1, 65 leaves, 2 steps):

$$\frac{(b c-a d)^2 (c+d x)^{11}}{11 d^3}-\frac{b (b c-a d) (c+d x)^{12}}{6 d^3}+\frac{b^2 (c+d x)^{13}}{13 d^3}$$

Result (type 1, 358 leaves):

$$a^2 c^{10} x+a c^9 (b c+5 a d) x^2+\frac{1}{3} c^8 \left(b^2 c^2+20 a b c d+45 a^2 d^2\right) x^3+\frac{5}{2} c^7 d \left(b^2 c^2+9 a b c d+12 a^2 d^2\right) x^4+3 c^6 d^2 \left(3 b^2 c^2+16 a b c d+14 a^2 d^2\right) x^5+2 c^5 d^3 \left(10 b^2 c^2+35 a b c d+21 a^2 d^2\right) x^6+6 c^4 d^4 \left(5 b^2 c^2+12 a b c d+5 a^2 d^2\right) x^7+\frac{3}{2} c^3 d^5 \left(21 b^2 c^2+35 a b c d+10 a^2 d^2\right) x^8+\frac{5}{3} c^2 d^6 \left(14 b^2 c^2+16 a b c d+3 a^2 d^2\right) x^9+c d^7 \left(12 b^2 c^2+9 a b c d+a^2 d^2\right) x^{10}+\frac{1}{11} d^8 \left(45 b^2 c^2+20 a b c d+a^2 d^2\right) x^{11}+\frac{1}{6} b d^9 (5 b c+a d) x^{12}+\frac{1}{13} b^2 d^{10} x^{13}$$

Problem 1310: Result more than twice size of optimal antiderivative.

$$\int (a+b x) (c+d x)^{10} \, dx$$

Optimal (type 1, 38 leaves, 2 steps):

$$-\frac{(b c-a d)(c+d x)^{11}}{11 d^2}+\frac{b(c+d x)^{12}}{12 d^2}$$

Result (type 1, 220 leaves):

$$a c^{10} x+\frac{1}{2} c^9 (b c+10 a d) x^2+\frac{5}{3} c^8 d (2 b c+9 a d) x^3+\frac{15}{4} c^7 d^2 (3 b c+8 a d) x^4+6 c^6 d^3 (4 b c+7 a d) x^5+7 c^5 d^4 (5 b c+6 a d) x^6+6 c^4 d^5 (6 b c+5 a d) x^7+\frac{15}{4} c^3 d^6 (7 b c+4 a d) x^8+\frac{5}{3} c^2 d^7 (8 b c+3 a d) x^9+\frac{1}{2} c d^8 (9 b c+2 a d) x^{10}+\frac{1}{11} d^9 (10 b c+a d) x^{11}+\frac{1}{12} b d^{10} x^{12}$$

Problem 1312: Result more than twice size of optimal antiderivative.

$$\int \frac{(c+d x)^{10}}{a+b x} \, dx$$

Optimal (type 3, 241 leaves, 2 steps):

$$\frac{d (b c-a d)^9 x}{b^{10}}+\frac{(b c-a d)^8 (c+d x)^2}{2 b^9}+\frac{(b c-a d)^7 (c+d x)^3}{3 b^8}+\frac{(b c-a d)^6 (c+d x)^4}{4 b^7}+\frac{(b c-a d)^5 (c+d x)^5}{5 b^6}+\frac{(b c-a d)^4 (c+d x)^6}{6 b^5}+\frac{(b c-a d)^3 (c+d x)^7}{7 b^4}+\frac{(b c-a d)^2 (c+d x)^8}{8 b^3}+\frac{(b c-a d) (c+d x)^9}{9 b^2}+\frac{(c+d x)^{10}}{10 b}+\frac{(b c-a d)^{10} \text{Log}[a+b x]}{b^{11}}$$

Result (type 3, 591 leaves):

$$\frac{1}{2520 b^{10}} d x \Big(-2520 a^9 d^9+1260 a^8 b d^8 (20 c+d x)-840 a^7 b^2 d^7 (135 c^2+15 c d x+d^2 x^2)+210 a^6 b^3 d^6 (1440 c^3+270 c^2 d x+40 c d^2 x^2+3 d^3 x^3)-252 a^5 b^4 d^5 (2100 c^4+600 c^3 d x+150 c^2 d^2 x^2+25 c d^3 x^3+2 d^4 x^4)+210 a^4 b^5 d^4 (3024 c^5+1260 c^4 d x+480 c^3 d^2 x^2+135 c^2 d^3 x^3+24 c d^4 x^4+2 d^5 x^5)-120 a^3 b^6 d^3 (4410 c^6+2646 c^5 d x+1470 c^4 d^2 x^2+630 c^3 d^3 x^3+189 c^2 d^4 x^4+35 c d^5 x^5+3 d^6 x^6)+45 a^2 b^7 d^2 (6720 c^7+5880 c^6 d x+4704 c^5 d^2 x^2+2940 c^4 d^3 x^3+1344 c^3 d^4 x^4+420 c^2 d^5 x^5+80 c d^6 x^6+7 d^7 x^7)-10 a b^8 d (11340 c^8+15120 c^7 d x+17640 c^6 d^2 x^2+15876 c^5 d^3 x^3+10584 c^4 d^4 x^4+5040 c^3 d^5 x^5+1620 c^2 d^6 x^6+315 c d^7 x^7+28 d^8 x^8)+b^9 (25200 c^9+56700 c^8 d x+100800 c^7 d^2 x^2+132300 c^6 d^3 x^3+127008 c^5 d^4 x^4+88200 c^4 d^5 x^5+43200 c^3 d^6 x^6+14175 c^2 d^7 x^7+2800 c d^8 x^8+252 d^9 x^9)\Big)+\frac{(b c-a d)^{10} \text{Log}[a+b x]}{b^{11}}$$

Problem 1313: Result more than twice size of optimal antiderivative.

$$\int \frac{(c+d x)^{10}}{(a+b x)^2} \, dx$$

Optimal (type 3, 258 leaves, 2 steps):

$$\frac{45\,d^2\,(b\,c-a\,d)^8\,x}{b^{10}}-\frac{(b\,c-a\,d)^{10}}{b^{11}\,(a+b\,x)}+\frac{60\,d^3\,(b\,c-a\,d)^7\,(a+b\,x)^2}{b^{11}}+\frac{70\,d^4\,(b\,c-a\,d)^6\,(a+b\,x)^3}{b^{11}}+\frac{63\,d^5\,(b\,c-a\,d)^5\,(a+b\,x)^4}{b^{11}}+\frac{42\,d^6\,(b\,c-a\,d)^4\,(a+b\,x)^5}{b^{11}}+\frac{20\,d^7\,(b\,c-a\,d)^3\,(a+b\,x)^6}{b^{11}}+\frac{45\,d^8\,(b\,c-a\,d)^2\,(a+b\,x)^7}{7\,b^{11}}+\frac{5\,d^9\,(b\,c-a\,d)\,(a+b\,x)^8}{4\,b^{11}}+\frac{d^{10}\,(a+b\,x)^9}{9\,b^{11}}+\frac{10\,d\,(b\,c-a\,d)^9\,\text{Log}[a+b\,x]}{b^{11}}$$

Result (type 3, 708 leaves):

$$\frac{1}{252\,b^{11}\,(a+b\,x)}\Big(-252\,a^{10}\,d^{10}+252\,a^9\,b\,d^9\,(10\,c+9\,d\,x)+1260\,a^8\,b^2\,d^8\,(-9\,c^2-16\,c\,d\,x+d^2\,x^2)-420\,a^7\,b^3\,d^7\,(-72\,c^3-189\,c^2\,d\,x+27\,c\,d^2\,x^2+d^3\,x^3)+210\,a^6\,b^4\,d^6\,(-252\,c^4-864\,c^3\,d\,x+216\,c^2\,d^2\,x^2+18\,c\,d^3\,x^3+d^4\,x^4)-126\,a^5\,b^5\,d^5\,(-504\,c^5-2100\,c^4\,d\,x+840\,c^3\,d^2\,x^2+120\,c^2\,d^3\,x^3+15\,c\,d^4\,x^4+d^5\,x^5)+42\,a^4\,b^6\,d^4\,(-1260\,c^6-6048\,c^5\,d\,x+3780\,c^4\,d^2\,x^2+840\,c^3\,d^3\,x^3+180\,c^2\,d^4\,x^4+27\,c\,d^5\,x^5+2\,d^6\,x^6)-12\,a^3\,b^7\,d^3\,(-2520\,c^7-13230\,c^6\,d\,x+13230\,c^5\,d^2\,x^2+4410\,c^4\,d^3\,x^3+1470\,c^3\,d^4\,x^4+378\,c^2\,d^5\,x^5+63\,c\,d^6\,x^6+5\,d^7\,x^7)+9\,a^2\,b^8\,d^2\,(-1260\,c^8-6720\,c^7\,d\,x+11760\,c^6\,d^2\,x^2+5880\,c^5\,d^3\,x^3+2940\,c^4\,d^4\,x^4+1176\,c^3\,d^5\,x^5+336\,c^2\,d^6\,x^6+60\,c\,d^7\,x^7+5\,d^8\,x^8)-a\,b^9\,d\,(-2520\,c^9-11340\,c^8\,d\,x+45360\,c^7\,d^2\,x^2+35280\,c^6\,d^3\,x^3+26460\,c^5\,d^4\,x^4+15876\,c^4\,d^5\,x^5+7056\,c^3\,d^6\,x^6+2160\,c^2\,d^7\,x^7+405\,c\,d^8\,x^8+35\,d^9\,x^9)+b^{10}\,(-252\,c^{10}+11340\,c^8\,d^2\,x^2+15120\,c^7\,d^3\,x^3+17640\,c^6\,d^4\,x^4+15876\,c^5\,d^5\,x^5+10584\,c^4\,d^6\,x^6+5040\,c^3\,d^7\,x^7+1620\,c^2\,d^8\,x^8+315\,c\,d^9\,x^9+28\,d^{10}\,x^{10})-2520\,d\,(-b\,c+a\,d)^9\,(a+b\,x)\,\text{Log}[a+b\,x]\Big)$$

Problem 1314: Result more than twice size of optimal antiderivative.

$$\int\frac{(c+d\,x)^{10}}{(a+b\,x)^3}\,dx$$

Optimal (type 3, 262 leaves, 2 steps):

$$\frac{120\,d^3\,(b\,c-a\,d)^7\,x}{b^{10}}-\frac{(b\,c-a\,d)^{10}}{2\,b^{11}\,(a+b\,x)^2}-\frac{10\,d\,(b\,c-a\,d)^9}{b^{11}\,(a+b\,x)}+\frac{105\,d^4\,(b\,c-a\,d)^6\,(a+b\,x)^2}{b^{11}}+\frac{84\,d^5\,(b\,c-a\,d)^5\,(a+b\,x)^3}{b^{11}}+\frac{105\,d^6\,(b\,c-a\,d)^4\,(a+b\,x)^4}{2\,b^{11}}+\frac{24\,d^7\,(b\,c-a\,d)^3\,(a+b\,x)^5}{b^{11}}+\frac{15\,d^8\,(b\,c-a\,d)^2\,(a+b\,x)^6}{2\,b^{11}}+\frac{10\,d^9\,(b\,c-a\,d)\,(a+b\,x)^7}{7\,b^{11}}+\frac{d^{10}\,(a+b\,x)^8}{8\,b^{11}}+\frac{45\,d^2\,(b\,c-a\,d)^8\,\text{Log}[a+b\,x]}{b^{11}}$$

Result (type 3, 708 leaves):

$$\frac{1}{56\,b^{11}\,(a+b\,x)^2}\Big(532\,a^{10}\,d^{10}-56\,a^9\,b\,d^9\,(85\,c+26\,d\,x)+28\,a^8\,b^2\,d^8\,(675\,c^2+380\,c\,d\,x-116\,d^2\,x^2)-280\,a^7\,b^3\,d^7\,(156\,c^3+117\,c^2\,d\,x-91\,c\,d^2\,x^2+3\,d^3\,x^3)+210\,a^6\,b^4\,d^6\,(308\,c^4+256\,c^3\,d\,x-414\,c^2\,d^2\,x^2+32\,c\,d^3\,x^3+d^4\,x^4)-84\,a^5\,b^5\,d^5\,(756\,c^5+560\,c^4\,d\,x-2000\,c^3\,d^2\,x^2+280\,c^2\,d^3\,x^3+20\,c\,d^4\,x^4+d^5\,x^5)+42\,a^4\,b^6\,d^4\,(980\,c^6+336\,c^5\,d\,x-4760\,c^4\,d^2\,x^2+1120\,c^3\,d^3\,x^3+140\,c^2\,d^4\,x^4+16\,c\,d^5\,x^5+d^6\,x^6)-24\,a^3\,b^7\,d^3\,(700\,c^7-490\,c^6\,d\,x-6174\,c^5\,d^2\,x^2+2450\,c^4\,d^3\,x^3+490\,c^3\,d^4\,x^4+98\,c^2\,d^5\,x^5+14\,c\,d^6\,x^6+d^7\,x^7)+3\,a^2\,b^8\,d^2\,(1260\,c^8-4480\,c^7\,d\,x-21\,560\,c^6\,d^2\,x^2+15\,680\,c^5\,d^3\,x^3+4900\,c^4\,d^4\,x^4+1568\,c^3\,d^5\,x^5+392\,c^2\,d^6\,x^6+64\,c\,d^7\,x^7+5\,d^8\,x^8)-2\,a\,b^9\,d\,(140\,c^9-2520\,c^8\,d\,x-6720\,c^7\,d^2\,x^2+11\,760\,c^6\,d^3\,x^3+5880\,c^5\,d^4\,x^4+2940\,c^4\,d^5\,x^5+1176\,c^3\,d^6\,x^6+336\,c^2\,d^7\,x^7+60\,c\,d^8\,x^8+5\,d^9\,x^9)+b^{10}\,(-28\,c^{10}-560\,c^9\,d\,x+6720\,c^7\,d^3\,x^3+5880\,c^6\,d^4\,x^4+4704\,c^5\,d^5\,x^5+2940\,c^4\,d^6\,x^6+1344\,c^3\,d^7\,x^7+420\,c^2\,d^8\,x^8+80\,c\,d^9\,x^9+7\,d^{10}\,x^{10})+2520\,d^2\,(b\,c-a\,d)^8\,(a+b\,x)^2\,\text{Log}[a+b\,x]\Big)$$

Problem 1320: Result more than twice size of optimal antiderivative.

$$\int\frac{(c+d\,x)^{10}}{(a+b\,x)^9}\,dx$$

Optimal (type 3, 258 leaves, 2 steps):

$$\frac{d^9\,(10\,b\,c-9\,a\,d)\,x}{b^{10}}+\frac{d^{10}\,x^2}{2\,b^9}-\frac{(b\,c-a\,d)^{10}}{8\,b^{11}\,(a+b\,x)^8}-\frac{10\,d\,(b\,c-a\,d)^9}{7\,b^{11}\,(a+b\,x)^7}-\frac{15\,d^2\,(b\,c-a\,d)^8}{2\,b^{11}\,(a+b\,x)^6}-\frac{24\,d^3\,(b\,c-a\,d)^7}{b^{11}\,(a+b\,x)^5}-\frac{105\,d^4\,(b\,c-a\,d)^6}{2\,b^{11}\,(a+b\,x)^4}-\frac{84\,d^5\,(b\,c-a\,d)^5}{b^{11}\,(a+b\,x)^3}-\frac{105\,d^6\,(b\,c-a\,d)^4}{b^{11}\,(a+b\,x)^2}-\frac{120\,d^7\,(b\,c-a\,d)^3}{b^{11}\,(a+b\,x)}+\frac{45\,d^8\,(b\,c-a\,d)^2\,\text{Log}[a+b\,x]}{b^{11}}$$

Result (type 3, 712 leaves):

$$\frac{1}{56\,b^{11}\,(a+b\,x)^8}\Big(3601\,a^{10}\,d^{10}+2\,a^9\,b\,d^9\,(-4609\,c+13\,144\,d\,x)+a^8\,b^2\,d^8\,(6849\,c^2-68\,704\,c\,d\,x+81\,928\,d^2\,x^2)+8\,a^7\,b^3\,d^7\,(-105\,c^3+6534\,c^2\,d\,x-27\,538\,c\,d^2\,x^2+17\,542\,d^3\,x^3)+14\,a^6\,b^4\,d^6\,(-15\,c^4-480\,c^3\,d\,x+12\,348\,c^2\,d^2\,x^2-28\,112\,c\,d^3\,x^3+10\,010\,d^4\,x^4)-28\,a^5\,b^5\,d^5\,(3\,c^5+60\,c^4\,d\,x+840\,c^3\,d^2\,x^2-11\,508\,c^2\,d^3\,x^3+15\,050\,c\,d^4\,x^4-2744\,d^5\,x^5)-14\,a^4\,b^6\,d^4\,(3\,c^6+48\,c^5\,d\,x+420\,c^4\,d^2\,x^2+3360\,c^3\,d^3\,x^3-26\,250\,c^2\,d^4\,x^4+19\,040\,c\,d^5\,x^5-1064\,d^6\,x^6)-8\,a^3\,b^7\,d^3\,(3\,c^7+42\,c^6\,d\,x+294\,c^5\,d^2\,x^2+1470\,c^4\,d^3\,x^3+7350\,c^3\,d^4\,x^4-32\,340\,c^2\,d^5\,x^5+10\,780\,c\,d^6\,x^6+728\,d^7\,x^7)-a^2\,b^8\,d^2\,(15\,c^8+192\,c^7\,d\,x+1176\,c^6\,d^2\,x^2+4704\,c^5\,d^3\,x^3+14\,700\,c^4\,d^4\,x^4+47\,040\,c^3\,d^5\,x^5-105\,840\,c^2\,d^6\,x^6+4480\,c\,d^7\,x^7+3248\,d^8\,x^8)-2\,a\,b^9\,d\,(5\,c^9+60\,c^8\,d\,x+336\,c^7\,d^2\,x^2+1176\,c^6\,d^3\,x^3+2940\,c^5\,d^4\,x^4+5880\,c^4\,d^5\,x^5+11\,760\,c^3\,d^6\,x^6-10\,080\,c^2\,d^7\,x^7-2240\,c\,d^8\,x^8+140\,d^9\,x^9)-b^{10}\,(7\,c^{10}+80\,c^9\,d\,x+420\,c^8\,d^2\,x^2+1344\,c^7\,d^3\,x^3+2940\,c^6\,d^4\,x^4+4704\,c^5\,d^5\,x^5+5880\,c^4\,d^6\,x^6+6720\,c^3\,d^7\,x^7-560\,c\,d^9\,x^9-28\,d^{10}\,x^{10})+2520\,d^8\,(b\,c-a\,d)^2\,(a+b\,x)^8\,\text{Log}[a+b\,x]\Big)$$

Problem 1321: Result more than twice size of optimal antiderivative.

$$\int \frac{(c+d\,x)^{10}}{(a+b\,x)^{10}}\,dx$$

Optimal (type 3, 257 leaves, 2 steps):

$$\frac{d^{10}\,x}{b^{10}}-\frac{(b\,c-a\,d)^{10}}{9\,b^{11}\,(a+b\,x)^9}-\frac{5\,d\,(b\,c-a\,d)^9}{4\,b^{11}\,(a+b\,x)^8}-\frac{45\,d^2\,(b\,c-a\,d)^8}{7\,b^{11}\,(a+b\,x)^7}-\frac{20\,d^3\,(b\,c-a\,d)^7}{b^{11}\,(a+b\,x)^6}-\frac{42\,d^4\,(b\,c-a\,d)^6}{b^{11}\,(a+b\,x)^5}-\frac{63\,d^5\,(b\,c-a\,d)^5}{b^{11}\,(a+b\,x)^4}-\frac{70\,d^6\,(b\,c-a\,d)^4}{b^{11}\,(a+b\,x)^3}-\frac{60\,d^7\,(b\,c-a\,d)^3}{b^{11}\,(a+b\,x)^2}-\frac{45\,d^8\,(b\,c-a\,d)^2}{b^{11}\,(a+b\,x)}+\frac{10\,d^9\,(b\,c-a\,d)\,\mathrm{Log}[a+b\,x]}{b^{11}}$$

Result (type 3, 708 leaves):

$$-\frac{1}{252\,b^{11}\,(a+b\,x)^9}\Big(4861\,a^{10}\,d^{10}+a^9\,b\,d^9\,(-7129\,c+41\,229\,d\,x)+9\,a^8\,b^2\,d^8\,(140\,c^2-6849\,c\,d\,x+17\,064\,d^2\,x^2)+12\,a^7\,b^3\,d^7\,(35\,c^3+945\,c^2\,d\,x-19\,602\,c\,d^2\,x^2+27\,342\,d^3\,x^3)+42\,a^6\,b^4\,d^6\,(5\,c^4+90\,c^3\,d\,x+1080\,c^2\,d^2\,x^2-12\,348\,c\,d^3\,x^3+10\,458\,d^4\,x^4)+126\,a^5\,b^5\,d^5\,(c^5+15\,c^4\,d\,x+120\,c^3\,d^2\,x^2+840\,c^2\,d^3\,x^3-5754\,c\,d^4\,x^4+2982\,d^5\,x^5)+42\,a^4\,b^6\,d^4\,(2\,c^6+27\,c^5\,d\,x+180\,c^4\,d^2\,x^2+840\,c^3\,d^3\,x^3+3780\,c^2\,d^4\,x^4-15\,750\,c\,d^5\,x^5+4704\,d^6\,x^6)+12\,a^3\,b^7\,d^3\,(5\,c^7+63\,c^6\,d\,x+378\,c^5\,d^2\,x^2+1470\,c^4\,d^3\,x^3+4410\,c^3\,d^4\,x^4+13\,230\,c^2\,d^5\,x^5-32\,340\,c\,d^6\,x^6+4536\,d^7\,x^7)+9\,a^2\,b^8\,d^2\,(5\,c^8+60\,c^7\,d\,x+336\,c^6\,d^2\,x^2+1176\,c^5\,d^3\,x^3+2940\,c^4\,d^4\,x^4+5880\,c^3\,d^5\,x^5+11\,760\,c^2\,d^6\,x^6-15\,120\,c\,d^7\,x^7+252\,d^8\,x^8)+a\,b^9\,d\,(35\,c^9+405\,c^8\,d\,x+2160\,c^7\,d^2\,x^2+7056\,c^6\,d^3\,x^3+15\,876\,c^5\,d^4\,x^4+26\,460\,c^4\,d^5\,x^5+35\,280\,c^3\,d^6\,x^6+45\,360\,c^2\,d^7\,x^7-22\,680\,c\,d^8\,x^8-2268\,d^9\,x^9)+b^{10}\,(28\,c^{10}+315\,c^9\,d\,x+1620\,c^8\,d^2\,x^2+5040\,c^7\,d^3\,x^3+10\,584\,c^6\,d^4\,x^4+15\,876\,c^5\,d^5\,x^5+17\,640\,c^4\,d^6\,x^6+15\,120\,c^3\,d^7\,x^7+11\,340\,c^2\,d^8\,x^8-252\,d^{10}\,x^{10})+2520\,d^9\,(-b\,c+a\,d)\,(a+b\,x)^9\,\mathrm{Log}[a+b\,x]\Big)$$

Problem 1322: Result more than twice size of optimal antiderivative.

$$\int \frac{(c+d\,x)^{10}}{(a+b\,x)^{11}}\,dx$$

Optimal (type 3, 271 leaves, 2 steps):

$$-\frac{(b c-a d)^{10}}{10 b^{11} (a+b x)^{10}}-\frac{10 d (b c-a d)^9}{9 b^{11} (a+b x)^9}-\frac{45 d^2 (b c-a d)^8}{8 b^{11} (a+b x)^8}-\frac{120 d^3 (b c-a d)^7}{7 b^{11} (a+b x)^7}-\frac{35 d^4 (b c-a d)^6}{b^{11} (a+b x)^6}-\frac{252 d^5 (b c-a d)^5}{5 b^{11} (a+b x)^5}-\frac{105 d^6 (b c-a d)^4}{2 b^{11} (a+b x)^4}-\frac{40 d^7 (b c-a d)^3}{b^{11} (a+b x)^3}-\frac{45 d^8 (b c-a d)^2}{2 b^{11} (a+b x)^2}-\frac{10 d^9 (b c-a d)}{b^{11} (a+b x)}+\frac{d^{10} \text{Log}[a+b x]}{b^{11}}$$

Result (type 3, 591 leaves):

$$-\frac{1}{2520 b^{11} (a+b x)^{10}} (b c-a d) \Big(7381 a^9 d^9+a^8 b d^8 (4861 c+71290 d x)+a^7 b^2 d^7 (3601 c^2+46090 c d x+308205 d^2 x^2)+a^6 b^3 d^6 (2761 c^3+33490 c^2 d x+194805 c d^2 x^2+784080 d^3 x^3)+a^5 b^4 d^5 (2131 c^4+25090 c^3 d x+138105 c^2 d^2 x^2+481680 c d^3 x^3+1296540 d^4 x^4)+a^4 b^5 d^4 (1627 c^5+18790 c^4 d x+100305 c^3 d^2 x^2+330480 c^2 d^3 x^3+767340 c d^4 x^4+1450008 d^5 x^5)+a^3 b^6 d^3 (1207 c^6+13750 c^5 d x+71955 c^4 d^2 x^2+229680 c^3 d^3 x^3+502740 c^2 d^4 x^4+814968 c d^5 x^5+1102500 d^6 x^6)+a^2 b^7 d^2 (847 c^7+9550 c^6 d x+49275 c^5 d^2 x^2+154080 c^4 d^3 x^3+326340 c^3 d^4 x^4+497448 c^2 d^5 x^5+573300 c d^6 x^6+554400 d^7 x^7)+a b^8 d (532 c^8+5950 c^7 d x+30375 c^6 d^2 x^2+93600 c^5 d^3 x^3+194040 c^4 d^4 x^4+285768 c^3 d^5 x^5+308700 c^2 d^6 x^6+252000 c d^7 x^7+170100 d^8 x^8)+b^9 (252 c^9+2800 c^8 d x+14175 c^7 d^2 x^2+43200 c^6 d^3 x^3+88200 c^5 d^4 x^4+127008 c^4 d^5 x^5+132300 c^3 d^6 x^6+100800 c^2 d^7 x^7+56700 c d^8 x^8+25200 d^9 x^9)\Big)+\frac{d^{10} \text{Log}[a+b x]}{b^{11}}$$

Problem 1323: Result more than twice size of optimal antiderivative.

$$\int \frac{(c+d x)^{10}}{(a+b x)^{12}} \, dx$$

Optimal (type 1, 28 leaves, 1 step):

$$-\frac{(c+d x)^{11}}{11 (b c-a d) (a+b x)^{11}}$$

Result (type 1, 665 leaves):

$$-\frac{1}{11\,b^{11}\,(a+b\,x)^{11}}\left(a^{10}\,d^{10}+a^9\,b\,d^9\,(c+11\,d\,x)+a^8\,b^2\,d^8\,(c^2+11\,c\,d\,x+55\,d^2\,x^2)+a^7\,b^3\,d^7\,(c^3+11\,c^2\,d\,x+55\,c\,d^2\,x^2+165\,d^3\,x^3)+a^6\,b^4\,d^6\,(c^4+11\,c^3\,d\,x+55\,c^2\,d^2\,x^2+165\,c\,d^3\,x^3+330\,d^4\,x^4)+a^5\,b^5\,d^5\,(c^5+11\,c^4\,d\,x+55\,c^3\,d^2\,x^2+165\,c^2\,d^3\,x^3+330\,c\,d^4\,x^4+462\,d^5\,x^5)+a^4\,b^6\,d^4\,(c^6+11\,c^5\,d\,x+55\,c^4\,d^2\,x^2+165\,c^3\,d^3\,x^3+330\,c^2\,d^4\,x^4+462\,c\,d^5\,x^5+462\,d^6\,x^6)+a^3\,b^7\,d^3\,(c^7+11\,c^6\,d\,x+55\,c^5\,d^2\,x^2+165\,c^4\,d^3\,x^3+330\,c^3\,d^4\,x^4+462\,c^2\,d^5\,x^5+462\,c\,d^6\,x^6+330\,d^7\,x^7)+a^2\,b^8\,d^2\,(c^8+11\,c^7\,d\,x+55\,c^6\,d^2\,x^2+165\,c^5\,d^3\,x^3+330\,c^4\,d^4\,x^4+462\,c^3\,d^5\,x^5+462\,c^2\,d^6\,x^6+330\,c\,d^7\,x^7+165\,d^8\,x^8)+a\,b^9\,d\,(c^9+11\,c^8\,d\,x+55\,c^7\,d^2\,x^2+165\,c^6\,d^3\,x^3+330\,c^5\,d^4\,x^4+462\,c^4\,d^5\,x^5+462\,c^3\,d^6\,x^6+330\,c^2\,d^7\,x^7+165\,c\,d^8\,x^8+55\,d^9\,x^9)+b^{10}\,(c^{10}+11\,c^9\,d\,x+55\,c^8\,d^2\,x^2+165\,c^7\,d^3\,x^3+330\,c^6\,d^4\,x^4+462\,c^5\,d^5\,x^5+462\,c^4\,d^6\,x^6+330\,c^3\,d^7\,x^7+165\,c^2\,d^8\,x^8+55\,c\,d^9\,x^9+11\,d^{10}\,x^{10})\right)$$

Problem 1324: Result more than twice size of optimal antiderivative.

$$\int\frac{(c+d\,x)^{10}}{(a+b\,x)^{13}}\,dx$$

Optimal (type 1, 58 leaves, 2 steps):

$$-\frac{(c+d\,x)^{11}}{12\,(b\,c-a\,d)\,(a+b\,x)^{12}}+\frac{d\,(c+d\,x)^{11}}{132\,(b\,c-a\,d)^2\,(a+b\,x)^{11}}$$

Result (type 1, 684 leaves):

$$-\frac{1}{132\,b^{11}\,(a+b\,x)^{12}}\left(a^{10}\,d^{10}+2\,a^9\,b\,d^9\,(c+6\,d\,x)+3\,a^8\,b^2\,d^8\,(c^2+8\,c\,d\,x+22\,d^2\,x^2)+4\,a^7\,b^3\,d^7\,(c^3+9\,c^2\,d\,x+33\,c\,d^2\,x^2+55\,d^3\,x^3)+a^6\,b^4\,d^6\,(5\,c^4+48\,c^3\,d\,x+198\,c^2\,d^2\,x^2+440\,c\,d^3\,x^3+495\,d^4\,x^4)+6\,a^5\,b^5\,d^5\,(c^5+10\,c^4\,d\,x+44\,c^3\,d^2\,x^2+110\,c^2\,d^3\,x^3+165\,c\,d^4\,x^4+132\,d^5\,x^5)+a^4\,b^6\,d^4\,(7\,c^6+72\,c^5\,d\,x+330\,c^4\,d^2\,x^2+880\,c^3\,d^3\,x^3+1485\,c^2\,d^4\,x^4+1584\,c\,d^5\,x^5+924\,d^6\,x^6)+4\,a^3\,b^7\,d^3\,(2\,c^7+21\,c^6\,d\,x+99\,c^5\,d^2\,x^2+275\,c^4\,d^3\,x^3+495\,c^3\,d^4\,x^4+594\,c^2\,d^5\,x^5+462\,c\,d^6\,x^6+198\,d^7\,x^7)+3\,a^2\,b^8\,d^2\,(3\,c^8+32\,c^7\,d\,x+154\,c^6\,d^2\,x^2+440\,c^5\,d^3\,x^3+825\,c^4\,d^4\,x^4+1056\,c^3\,d^5\,x^5+924\,c^2\,d^6\,x^6+528\,c\,d^7\,x^7+165\,d^8\,x^8)+2\,a\,b^9\,d\,(5\,c^9+54\,c^8\,d\,x+264\,c^7\,d^2\,x^2+770\,c^6\,d^3\,x^3+1485\,c^5\,d^4\,x^4+1980\,c^4\,d^5\,x^5+1848\,c^3\,d^6\,x^6+1188\,c^2\,d^7\,x^7+495\,c\,d^8\,x^8+110\,d^9\,x^9)+b^{10}\,(11\,c^{10}+120\,c^9\,d\,x+594\,c^8\,d^2\,x^2+1760\,c^7\,d^3\,x^3+3465\,c^6\,d^4\,x^4+4752\,c^5\,d^5\,x^5+4620\,c^4\,d^6\,x^6+3168\,c^3\,d^7\,x^7+1485\,c^2\,d^8\,x^8+440\,c\,d^9\,x^9+66\,d^{10}\,x^{10})\right)$$

Problem 1325: Result more than twice size of optimal antiderivative.

$$\int\frac{(c+d\,x)^{10}}{(a+b\,x)^{14}}\,dx$$

Optimal (type 1, 89 leaves, 3 steps):

$$-\frac{(c+d\,x)^{11}}{13\,(b\,c-a\,d)\,(a+b\,x)^{13}}+\frac{d\,(c+d\,x)^{11}}{78\,(b\,c-a\,d)^2\,(a+b\,x)^{12}}-\frac{d^2\,(c+d\,x)^{11}}{858\,(b\,c-a\,d)^3\,(a+b\,x)^{11}}$$

Result (type 1, 690 leaves):

$$-\frac{1}{858\,b^{11}\,(a+b\,x)^{13}}\Big(a^{10}\,d^{10}+a^{9}\,b\,d^{9}\,(3\,c+13\,d\,x)+3\,a^{8}\,b^{2}\,d^{8}\,(2\,c^{2}+13\,c\,d\,x+26\,d^{2}\,x^{2})+2\,a^{7}\,b^{3}\,d^{7}\,(5\,c^{3}+39\,c^{2}\,d\,x+117\,c\,d^{2}\,x^{2}+143\,d^{3}\,x^{3})+a^{6}\,b^{4}\,d^{6}\,(15\,c^{4}+130\,c^{3}\,d\,x+468\,c^{2}\,d^{2}\,x^{2}+858\,c\,d^{3}\,x^{3}+715\,d^{4}\,x^{4})+3\,a^{5}\,b^{5}\,d^{5}\,(7\,c^{5}+65\,c^{4}\,d\,x+260\,c^{3}\,d^{2}\,x^{2}+572\,c^{2}\,d^{3}\,x^{3}+715\,c\,d^{4}\,x^{4}+429\,d^{5}\,x^{5})+a^{4}\,b^{6}\,d^{4}\,(28\,c^{6}+273\,c^{5}\,d\,x+1170\,c^{4}\,d^{2}\,x^{2}+2860\,c^{3}\,d^{3}\,x^{3}+4290\,c^{2}\,d^{4}\,x^{4}+3861\,c\,d^{5}\,x^{5}+1716\,d^{6}\,x^{6})+2\,a^{3}\,b^{7}\,d^{3}\,(18\,c^{7}+182\,c^{6}\,d\,x+819\,c^{5}\,d^{2}\,x^{2}+2145\,c^{4}\,d^{3}\,x^{3}+3575\,c^{3}\,d^{4}\,x^{4}+3861\,c^{2}\,d^{5}\,x^{5}+2574\,c\,d^{6}\,x^{6}+858\,d^{7}\,x^{7})+3\,a^{2}\,b^{8}\,d^{2}\,(15\,c^{8}+156\,c^{7}\,d\,x+728\,c^{6}\,d^{2}\,x^{2}+2002\,c^{5}\,d^{3}\,x^{3}+3575\,c^{4}\,d^{4}\,x^{4}+4290\,c^{3}\,d^{5}\,x^{5}+3432\,c^{2}\,d^{6}\,x^{6}+1716\,c\,d^{7}\,x^{7}+429\,d^{8}\,x^{8})+a\,b^{9}\,d\,(55\,c^{9}+585\,c^{8}\,d\,x+2808\,c^{7}\,d^{2}\,x^{2}+8008\,c^{6}\,d^{3}\,x^{3}+15015\,c^{5}\,d^{4}\,x^{4}+19305\,c^{4}\,d^{5}\,x^{5}+17160\,c^{3}\,d^{6}\,x^{6}+10296\,c^{2}\,d^{7}\,x^{7}+3861\,c\,d^{8}\,x^{8}+715\,d^{9}\,x^{9})+b^{10}\,(66\,c^{10}+715\,c^{9}\,d\,x+3510\,c^{8}\,d^{2}\,x^{2}+10296\,c^{7}\,d^{3}\,x^{3}+20020\,c^{6}\,d^{4}\,x^{4}+27027\,c^{5}\,d^{5}\,x^{5}+25740\,c^{4}\,d^{6}\,x^{6}+17160\,c^{3}\,d^{7}\,x^{7}+7722\,c^{2}\,d^{8}\,x^{8}+2145\,c\,d^{9}\,x^{9}+286\,d^{10}\,x^{10})\Big)$$

Problem 1326: Result more than twice size of optimal antiderivative.

$$\int \frac{(c+d\,x)^{10}}{(a+b\,x)^{15}}\,dx$$

Optimal (type 1, 120 leaves, 4 steps):

$$-\frac{(c+d\,x)^{11}}{14\,(b\,c-a\,d)\,(a+b\,x)^{14}}+\frac{3\,d\,(c+d\,x)^{11}}{182\,(b\,c-a\,d)^{2}\,(a+b\,x)^{13}}-\frac{d^{2}\,(c+d\,x)^{11}}{364\,(b\,c-a\,d)^{3}\,(a+b\,x)^{12}}+\frac{d^{3}\,(c+d\,x)^{11}}{4004\,(b\,c-a\,d)^{4}\,(a+b\,x)^{11}}$$

Result (type 1, 692 leaves):

$$-\frac{1}{4004\,b^{11}\,(a+b\,x)^{14}}\Big(a^{10}\,d^{10}+2\,a^{9}\,b\,d^{9}\,(2\,c+7\,d\,x)+a^{8}\,b^{2}\,d^{8}\,(10\,c^{2}+56\,c\,d\,x+91\,d^{2}\,x^{2})+4\,a^{7}\,b^{3}\,d^{7}\,(5\,c^{3}+35\,c^{2}\,d\,x+91\,c\,d^{2}\,x^{2}+91\,d^{3}\,x^{3})+7\,a^{6}\,b^{4}\,d^{6}\,(5\,c^{4}+40\,c^{3}\,d\,x+130\,c^{2}\,d^{2}\,x^{2}+208\,c\,d^{3}\,x^{3}+143\,d^{4}\,x^{4})+14\,a^{5}\,b^{5}\,d^{5}\,(4\,c^{5}+35\,c^{4}\,d\,x+130\,c^{3}\,d^{2}\,x^{2}+260\,c^{2}\,d^{3}\,x^{3}+286\,c\,d^{4}\,x^{4}+143\,d^{5}\,x^{5})+7\,a^{4}\,b^{6}\,d^{4}\,(12\,c^{6}+112\,c^{5}\,d\,x+455\,c^{4}\,d^{2}\,x^{2}+1040\,c^{3}\,d^{3}\,x^{3}+1430\,c^{2}\,d^{4}\,x^{4}+1144\,c\,d^{5}\,x^{5}+429\,d^{6}\,x^{6})+4\,a^{3}\,b^{7}\,d^{3}\,(30\,c^{7}+294\,c^{6}\,d\,x+1274\,c^{5}\,d^{2}\,x^{2}+3185\,c^{4}\,d^{3}\,x^{3}+5005\,c^{3}\,d^{4}\,x^{4}+5005\,c^{2}\,d^{5}\,x^{5}+3003\,c\,d^{6}\,x^{6}+858\,d^{7}\,x^{7})+a^{2}\,b^{8}\,d^{2}\,(165\,c^{8}+1680\,c^{7}\,d\,x+7644\,c^{6}\,d^{2}\,x^{2}+20384\,c^{5}\,d^{3}\,x^{3}+35035\,c^{4}\,d^{4}\,x^{4}+40040\,c^{3}\,d^{5}\,x^{5}+30030\,c^{2}\,d^{6}\,x^{6}+13728\,c\,d^{7}\,x^{7}+3003\,d^{8}\,x^{8})+2\,a\,b^{9}\,d\,(110\,c^{9}+1155\,c^{8}\,d\,x+5460\,c^{7}\,d^{2}\,x^{2}+15288\,c^{6}\,d^{3}\,x^{3}+28028\,c^{5}\,d^{4}\,x^{4}+35035\,c^{4}\,d^{5}\,x^{5}+30030\,c^{3}\,d^{6}\,x^{6}+17160\,c^{2}\,d^{7}\,x^{7}+6006\,c\,d^{8}\,x^{8}+1001\,d^{9}\,x^{9})+b^{10}\,(286\,c^{10}+3080\,c^{9}\,d\,x+15015\,c^{8}\,d^{2}\,x^{2}+43680\,c^{7}\,d^{3}\,x^{3}+84084\,c^{6}\,d^{4}\,x^{4}+112112\,c^{5}\,d^{5}\,x^{5}+105105\,c^{4}\,d^{6}\,x^{6}+68640\,c^{3}\,d^{7}\,x^{7}+30030\,c^{2}\,d^{8}\,x^{8}+8008\,c\,d^{9}\,x^{9}+1001\,d^{10}\,x^{10})\Big)$$

Problem 1327: Result more than twice size of optimal antiderivative.

$$\int \frac{(c+d x)^{10}}{(a+b x)^{16}} \, dx$$

Optimal (type 1, 151 leaves, 5 steps):

$$-\frac{(c+d x)^{11}}{15 (b c-a d) (a+b x)^{15}}+\frac{2 d (c+d x)^{11}}{105 (b c-a d)^2 (a+b x)^{14}}-\frac{2 d^2 (c+d x)^{11}}{455 (b c-a d)^3 (a+b x)^{13}}+\frac{d^3 (c+d x)^{11}}{1365 (b c-a d)^4 (a+b x)^{12}}-\frac{d^4 (c+d x)^{11}}{15015 (b c-a d)^5 (a+b x)^{11}}$$

Result (type 1, 690 leaves):

$$-\frac{1}{15015 b^{11} (a+b x)^{15}}\Big(a^{10} d^{10}+5 a^9 b d^9 (c+3 d x)+15 a^8 b^2 d^8 \left(c^2+5 c d x+7 d^2 x^2\right)+5 a^7 b^3 d^7 \left(7 c^3+45 c^2 d x+105 c d^2 x^2+91 d^3 x^3\right)+35 a^6 b^4 d^6 \left(2 c^4+15 c^3 d x+45 c^2 d^2 x^2+65 c d^3 x^3+39 d^4 x^4\right)+21 a^5 b^5 d^5 \left(6 c^5+50 c^4 d x+175 c^3 d^2 x^2+325 c^2 d^3 x^3+325 c d^4 x^4+143 d^5 x^5\right)+35 a^4 b^6 d^4 \left(6 c^6+54 c^5 d x+210 c^4 d^2 x^2+455 c^3 d^3 x^3+585 c^2 d^4 x^4+429 c d^5 x^5+143 d^6 x^6\right)+5 a^3 b^7 d^3 \left(66 c^7+630 c^6 d x+2646 c^5 d^2 x^2+6370 c^4 d^3 x^3+9555 c^3 d^4 x^4+9009 c^2 d^5 x^5+5005 c d^6 x^6+1287 d^7 x^7\right)+15 a^2 b^8 d^2 \left(33 c^8+330 c^7 d x+1470 c^6 d^2 x^2+3822 c^5 d^3 x^3+6370 c^4 d^4 x^4+7007 c^3 d^5 x^5+5005 c^2 d^6 x^6+2145 c d^7 x^7+429 d^8 x^8\right)+5 a b^9 d \left(143 c^9+1485 c^8 d x+6930 c^7 d^2 x^2+19110 c^6 d^3 x^3+34398 c^5 d^4 x^4+42042 c^4 d^5 x^5+35035 c^3 d^6 x^6+19305 c^2 d^7 x^7+6435 c d^8 x^8+1001 d^9 x^9\right)+b^{10} \left(1001 c^{10}+10725 c^9 d x+51975 c^8 d^2 x^2+150150 c^7 d^3 x^3+286650 c^6 d^4 x^4+378378 c^5 d^5 x^5+350350 c^4 d^6 x^6+225225 c^3 d^7 x^7+96525 c^2 d^8 x^8+25025 c d^9 x^9+3003 d^{10} x^{10}\right)\Big)$$

Problem 1328: Result more than twice size of optimal antiderivative.

$$\int \frac{(c+d x)^{10}}{(a+b x)^{17}} \, dx$$

Optimal (type 1, 182 leaves, 6 steps):

$$-\frac{(c+d x)^{11}}{16 (b c-a d) (a+b x)^{16}}+\frac{d (c+d x)^{11}}{48 (b c-a d)^2 (a+b x)^{15}}-\frac{d^2 (c+d x)^{11}}{168 (b c-a d)^3 (a+b x)^{14}}+\frac{d^3 (c+d x)^{11}}{728 (b c-a d)^4 (a+b x)^{13}}-\frac{d^4 (c+d x)^{11}}{4368 (b c-a d)^5 (a+b x)^{12}}+\frac{d^5 (c+d x)^{11}}{48048 (b c-a d)^6 (a+b x)^{11}}$$

Result (type 1, 694 leaves):

$$-\frac{1}{48048\,b^{11}\,(a+b\,x)^{16}}\Big(a^{10}\,d^{10}+2\,a^9\,b\,d^9\,(3\,c+8\,d\,x)+3\,a^8\,b^2\,d^8\,(7\,c^2+32\,c\,d\,x+40\,d^2\,x^2)+8\,a^7\,b^3\,d^7\,(7\,c^3+42\,c^2\,d\,x+90\,c\,d^2\,x^2+70\,d^3\,x^3)+14\,a^6\,b^4\,d^6\,(9\,c^4+64\,c^3\,d\,x+180\,c^2\,d^2\,x^2+240\,c\,d^3\,x^3+130\,d^4\,x^4)+84\,a^5\,b^5\,d^5\,(3\,c^5+24\,c^4\,d\,x+80\,c^3\,d^2\,x^2+140\,c^2\,d^3\,x^3+130\,c\,d^4\,x^4+52\,d^5\,x^5)+14\,a^4\,b^6\,d^4\,(33\,c^6+288\,c^5\,d\,x+1080\,c^4\,d^2\,x^2+2240\,c^3\,d^3\,x^3+2730\,c^2\,d^4\,x^4+1872\,c\,d^5\,x^5+572\,d^6\,x^6)+8\,a^3\,b^7\,d^3\,(99\,c^7+924\,c^6\,d\,x+3780\,c^5\,d^2\,x^2+8820\,c^4\,d^3\,x^3+12740\,c^3\,d^4\,x^4+11466\,c^2\,d^5\,x^5+6006\,c\,d^6\,x^6+1430\,d^7\,x^7)+3\,a^2\,b^8\,d^2\,(429\,c^8+4224\,c^7\,d\,x+18480\,c^6\,d^2\,x^2+47040\,c^5\,d^3\,x^3+76440\,c^4\,d^4\,x^4+81536\,c^3\,d^5\,x^5+56056\,c^2\,d^6\,x^6+22880\,c\,d^7\,x^7+4290\,d^8\,x^8)+2\,a\,b^9\,d\,(1001\,c^9+10296\,c^8\,d\,x+47520\,c^7\,d^2\,x^2+129360\,c^6\,d^3\,x^3+229320\,c^5\,d^4\,x^4+275184\,c^4\,d^5\,x^5+224224\,c^3\,d^6\,x^6+120120\,c^2\,d^7\,x^7+38610\,c\,d^8\,x^8+5720\,d^9\,x^9)+b^{10}\,(3003\,c^{10}+32032\,c^9\,d\,x+154440\,c^8\,d^2\,x^2+443520\,c^7\,d^3\,x^3+840840\,c^6\,d^4\,x^4+1100736\,c^5\,d^5\,x^5+1009008\,c^4\,d^6\,x^6+640640\,c^3\,d^7\,x^7+270270\,c^2\,d^8\,x^8+68640\,c\,d^9\,x^9+8008\,d^{10}\,x^{10})\Big)$$

Problem 1329: Result more than twice size of optimal antiderivative.

$$\int\frac{(c+d\,x)^{10}}{(a+b\,x)^{18}}\,dx$$

Optimal (type 1, 213 leaves, 7 steps):

$$-\frac{(c+d\,x)^{11}}{17\,(b\,c-a\,d)\,(a+b\,x)^{17}}+\frac{3\,d\,(c+d\,x)^{11}}{136\,(b\,c-a\,d)^2\,(a+b\,x)^{16}}-\frac{d^2\,(c+d\,x)^{11}}{136\,(b\,c-a\,d)^3\,(a+b\,x)^{15}}+\frac{d^3\,(c+d\,x)^{11}}{476\,(b\,c-a\,d)^4\,(a+b\,x)^{14}}-\frac{3\,d^4\,(c+d\,x)^{11}}{6188\,(b\,c-a\,d)^5\,(a+b\,x)^{13}}+\frac{d^5\,(c+d\,x)^{11}}{12376\,(b\,c-a\,d)^6\,(a+b\,x)^{12}}-\frac{d^6\,(c+d\,x)^{11}}{136136\,(b\,c-a\,d)^7\,(a+b\,x)^{11}}$$

Result (type 1, 690 leaves):

$$-\frac{1}{136136\,b^{11}\,(a+b\,x)^{17}}\Big(a^{10}\,d^{10}+a^9\,b\,d^9\,(7\,c+17\,d\,x)+a^8\,b^2\,d^8\,(28\,c^2+119\,c\,d\,x+136\,d^2\,x^2)+4\,a^7\,b^3\,d^7\,(21\,c^3+119\,c^2\,d\,x+238\,c\,d^2\,x^2+170\,d^3\,x^3)+14\,a^6\,b^4\,d^6\,(15\,c^4+102\,c^3\,d\,x+272\,c^2\,d^2\,x^2+340\,c\,d^3\,x^3+170\,d^4\,x^4)+14\,a^5\,b^5\,d^5\,(33\,c^5+255\,c^4\,d\,x+816\,c^3\,d^2\,x^2+1360\,c^2\,d^3\,x^3+1190\,c\,d^4\,x^4+442\,d^5\,x^5)+14\,a^4\,b^6\,d^4\,(66\,c^6+561\,c^5\,d\,x+2040\,c^4\,d^2\,x^2+4080\,c^3\,d^3\,x^3+4760\,c^2\,d^4\,x^4+3094\,c\,d^5\,x^5+884\,d^6\,x^6)+4\,a^3\,b^7\,d^3\,(429\,c^7+3927\,c^6\,d\,x+15708\,c^5\,d^2\,x^2+35700\,c^4\,d^3\,x^3+49980\,c^3\,d^4\,x^4+43316\,c^2\,d^5\,x^5+21658\,c\,d^6\,x^6+4862\,d^7\,x^7)+a^2\,b^8\,d^2\,(3003\,c^8+29172\,c^7\,d\,x+125664\,c^6\,d^2\,x^2+314160\,c^5\,d^3\,x^3+499800\,c^4\,d^4\,x^4+519792\,c^3\,d^5\,x^5+346528\,c^2\,d^6\,x^6+136136\,c\,d^7\,x^7+24310\,d^8\,x^8)+a\,b^9\,d\,(5005\,c^9+51051\,c^8\,d\,x+233376\,c^7\,d^2\,x^2+628320\,c^6\,d^3\,x^3+1099560\,c^5\,d^4\,x^4+1299480\,c^4\,d^5\,x^5+1039584\,c^3\,d^6\,x^6+544544\,c^2\,d^7\,x^7+170170\,c\,d^8\,x^8+24310\,d^9\,x^9)+b^{10}\,(8008\,c^{10}+85085\,c^9\,d\,x+408408\,c^8\,d^2\,x^2+1166880\,c^7\,d^3\,x^3+2199120\,c^6\,d^4\,x^4+2858856\,c^5\,d^5\,x^5+2598960\,c^4\,d^6\,x^6+1633632\,c^3\,d^7\,x^7+680680\,c^2\,d^8\,x^8+170170\,c\,d^9\,x^9+19448\,d^{10}\,x^{10})\Big)$$

Problem 1330: Result more than twice size of optimal antiderivative.

$$\int \frac{(c+d x)^{10}}{(a+b x)^{19}} \, dx$$

Optimal (type 1, 244 leaves, 8 steps):

$$-\frac{(c+d x)^{11}}{18 (b c-a d) (a+b x)^{18}}+\frac{7 d (c+d x)^{11}}{306 (b c-a d)^2 (a+b x)^{17}}-\frac{7 d^2 (c+d x)^{11}}{816 (b c-a d)^3 (a+b x)^{16}}+\frac{7 d^3 (c+d x)^{11}}{2448 (b c-a d)^4 (a+b x)^{15}}-\frac{d^4 (c+d x)^{11}}{1224 (b c-a d)^5 (a+b x)^{14}}+\frac{d^5 (c+d x)^{11}}{5304 (b c-a d)^6 (a+b x)^{13}}-\frac{d^6 (c+d x)^{11}}{31824 (b c-a d)^7 (a+b x)^{12}}+\frac{d^7 (c+d x)^{11}}{350064 (b c-a d)^8 (a+b x)^{11}}$$

Result (type 1, 694 leaves):

$$-\frac{1}{350064 b^{11} (a+b x)^{18}}\Big(a^{10} d^{10}+2 a^9 b d^9 (4 c+9 d x)+9 a^8 b^2 d^8 (4 c^2+16 c d x+17 d^2 x^2)+24 a^7 b^3 d^7 (5 c^3+27 c^2 d x+51 c d^2 x^2+34 d^3 x^3)+6 a^6 b^4 d^6 (55 c^4+360 c^3 d x+918 c^2 d^2 x^2+1088 c d^3 x^3+510 d^4 x^4)+36 a^5 b^5 d^5 (22 c^5+165 c^4 d x+510 c^3 d^2 x^2+816 c^2 d^3 x^3+680 c d^4 x^4+238 d^5 x^5)+6 a^4 b^6 d^4 (286 c^6+2376 c^5 d x+8415 c^4 d^2 x^2+16320 c^3 d^3 x^3+18360 c^2 d^4 x^4+11424 c d^5 x^5+3094 d^6 x^6)+24 a^3 b^7 d^3 (143 c^7+1287 c^6 d x+5049 c^5 d^2 x^2+11220 c^4 d^3 x^3+15300 c^3 d^4 x^4+12852 c^2 d^5 x^5+6188 c d^6 x^6+1326 d^7 x^7)+9 a^2 b^8 d^2 (715 c^8+6864 c^7 d x+29172 c^6 d^2 x^2+71808 c^5 d^3 x^3+112200 c^4 d^4 x^4+114240 c^3 d^5 x^5+74256 c^2 d^6 x^6+28288 c d^7 x^7+4862 d^8 x^8)+2 a b^9 d (5720 c^9+57915 c^8 d x+262548 c^7 d^2 x^2+700128 c^6 d^3 x^3+1211760 c^5 d^4 x^4+1413720 c^4 d^5 x^5+1113840 c^3 d^6 x^6+572832 c^2 d^7 x^7+175032 c d^8 x^8+24310 d^9 x^9)+b^{10} (19448 c^{10}+205920 c^9 d x+984555 c^8 d^2 x^2+2800512 c^7 d^3 x^3+5250960 c^6 d^4 x^4+6785856 c^5 d^5 x^5+6126120 c^4 d^6 x^6+3818880 c^3 d^7 x^7+1575288 c^2 d^8 x^8+388960 c d^9 x^9+43758 d^{10} x^{10})\Big)$$

Problem 1331: Result more than twice size of optimal antiderivative.

$$\int \frac{(c+d x)^{10}}{(a+b x)^{20}} \, dx$$

Optimal (type 1, 273 leaves, 2 steps):

$$-\frac{(b c-a d)^{10}}{19 b^{11} (a+b x)^{19}}-\frac{5 d (b c-a d)^9}{9 b^{11} (a+b x)^{18}}-\frac{45 d^2 (b c-a d)^8}{17 b^{11} (a+b x)^{17}}-\frac{15 d^3 (b c-a d)^7}{2 b^{11} (a+b x)^{16}}-\frac{14 d^4 (b c-a d)^6}{b^{11} (a+b x)^{15}}-\frac{18 d^5 (b c-a d)^5}{b^{11} (a+b x)^{14}}-\frac{210 d^6 (b c-a d)^4}{13 b^{11} (a+b x)^{13}}-\frac{10 d^7 (b c-a d)^3}{b^{11} (a+b x)^{12}}-\frac{45 d^8 (b c-a d)^2}{11 b^{11} (a+b x)^{11}}-\frac{d^9 (b c-a d)}{b^{11} (a+b x)^{10}}-\frac{d^{10}}{9 b^{11} (a+b x)^9}$$

Result (type 1, 692 leaves):

$$-\frac{1}{831402\, b^{11} (a+b x)^{19}} \Big(a^{10} d^{10} + a^9 b d^9 (9 c + 19 d x) + 9 a^8 b^2 d^8 (5 c^2 + 19 c d x + 19 d^2 x^2) + 3 a^7 b^3 d^7 (55 c^3 + 285 c^2 d x + 513 c d^2 x^2 + 323 d^3 x^3) + 3 a^6 b^4 d^6 (165 c^4 + 1045 c^3 d x + 2565 c^2 d^2 x^2 + 2907 c d^3 x^3 + 1292 d^4 x^4) + 9 a^5 b^5 d^5 (143 c^5 + 1045 c^4 d x + 3135 c^3 d^2 x^2 + 4845 c^2 d^3 x^3 + 3876 c d^4 x^4 + 1292 d^5 x^5) + 3 a^4 b^6 d^4 (1001 c^6 + 8151 c^5 d x + 28215 c^4 d^2 x^2 + 53295 c^3 d^3 x^3 + 58140 c^2 d^4 x^4 + 34884 c d^5 x^5 + 9044 d^6 x^6) + 3 a^3 b^7 d^3 (2145 c^7 + 19019 c^6 d x + 73359 c^5 d^2 x^2 + 159885 c^4 d^3 x^3 + 213180 c^3 d^4 x^4 + 174420 c^2 d^5 x^5 + 81396 c d^6 x^6 + 16796 d^7 x^7) + 9 a^2 b^8 d^2 (1430 c^8 + 13585 c^7 d x + 57057 c^6 d^2 x^2 + 138567 c^5 d^3 x^3 + 213180 c^4 d^4 x^4 + 213180 c^3 d^5 x^5 + 135660 c^2 d^6 x^6 + 50388 c d^7 x^7 + 8398 d^8 x^8) + a b^9 d (24310 c^9 + 244530 c^8 d x + 1100385 c^7 d^2 x^2 + 2909907 c^6 d^3 x^3 + 4988412 c^5 d^4 x^4 + 5755860 c^4 d^5 x^5 + 4476780 c^3 d^6 x^6 + 2267460 c^2 d^7 x^7 + 680238 c d^8 x^8 + 92378 d^9 x^9) + b^{10} (43758 c^{10} + 461890 c^9 d x + 2200770 c^8 d^2 x^2 + 6235515 c^7 d^3 x^3 + 11639628 c^6 d^4 x^4 + 14965236 c^5 d^5 x^5 + 13430340 c^4 d^6 x^6 + 8314020 c^3 d^7 x^7 + 3401190 c^2 d^8 x^8 + 831402 c d^9 x^9 + 92378 d^{10} x^{10})\Big)$$

Problem 1332: Result more than twice size of optimal antiderivative.

$$\int \frac{(c+d x)^{10}}{(a+b x)^{21}} \, dx$$

Optimal (type 1, 279 leaves, 2 steps):

$$-\frac{(b c-a d)^{10}}{20 b^{11} (a+b x)^{20}}-\frac{10 d (b c-a d)^9}{19 b^{11} (a+b x)^{19}}-\frac{5 d^2 (b c-a d)^8}{2 b^{11} (a+b x)^{18}}-\frac{120 d^3 (b c-a d)^7}{17 b^{11} (a+b x)^{17}}-\frac{105 d^4 (b c-a d)^6}{8 b^{11} (a+b x)^{16}}-\frac{84 d^5 (b c-a d)^5}{5 b^{11} (a+b x)^{15}}-\frac{15 d^6 (b c-a d)^4}{b^{11} (a+b x)^{14}}-\frac{120 d^7 (b c-a d)^3}{13 b^{11} (a+b x)^{13}}-\frac{15 d^8 (b c-a d)^2}{4 b^{11} (a+b x)^{12}}-\frac{10 d^9 (b c-a d)}{11 b^{11} (a+b x)^{11}}-\frac{d^{10}}{10 b^{11} (a+b x)^{10}}$$

Result (type 1, 692 leaves):

$$-\frac{1}{1\,847\,560\,b^{11}\,(a+b\,x)^{20}}\Big(a^{10}\,d^{10}+10\,a^9\,b\,d^9\,(c+2\,d\,x)+$$
$$5\,a^8\,b^2\,d^8\,(11\,c^2+40\,c\,d\,x+38\,d^2\,x^2)+20\,a^7\,b^3\,d^7\,(11\,c^3+55\,c^2\,d\,x+95\,c\,d^2\,x^2+57\,d^3\,x^3)+$$
$$5\,a^6\,b^4\,d^6\,(143\,c^4+880\,c^3\,d\,x+2090\,c^2\,d^2\,x^2+2280\,c\,d^3\,x^3+969\,d^4\,x^4)+$$
$$2\,a^5\,b^5\,d^5\,(1001\,c^5+7150\,c^4\,d\,x+20\,900\,c^3\,d^2\,x^2+31\,350\,c^2\,d^3\,x^3+24\,225\,c\,d^4\,x^4+7752\,d^5\,x^5)+$$
$$5\,a^4\,b^6\,d^4\,(1001\,c^6+8008\,c^5\,d\,x+27\,170\,c^4\,d^2\,x^2+50\,160\,c^3\,d^3\,x^3+53\,295\,c^2\,d^4\,x^4+$$
$$31\,008\,c\,d^5\,x^5+7752\,d^6\,x^6)+20\,a^3\,b^7\,d^3\,(572\,c^7+5005\,c^6\,d\,x+19\,019\,c^5\,d^2\,x^2+$$
$$40\,755\,c^4\,d^3\,x^3+53\,295\,c^3\,d^4\,x^4+42\,636\,c^2\,d^5\,x^5+19\,380\,c\,d^6\,x^6+3876\,d^7\,x^7)+$$
$$5\,a^2\,b^8\,d^2\,(4862\,c^8+45\,760\,c^7\,d\,x+190\,190\,c^6\,d^2\,x^2+456\,456\,c^5\,d^3\,x^3+692\,835\,c^4\,d^4\,x^4+$$
$$682\,176\,c^3\,d^5\,x^5+426\,360\,c^2\,d^6\,x^6+155\,040\,c\,d^7\,x^7+25\,194\,d^8\,x^8)+$$
$$10\,a\,b^9\,d\,(4862\,c^9+48\,620\,c^8\,d\,x+217\,360\,c^7\,d^2\,x^2+570\,570\,c^6\,d^3\,x^3+969\,969\,c^5\,d^4\,x^4+$$
$$1\,108\,536\,c^4\,d^5\,x^5+852\,720\,c^3\,d^6\,x^6+426\,360\,c^2\,d^7\,x^7+125\,970\,c\,d^8\,x^8+16\,796\,d^9\,x^9)+$$
$$b^{10}\,(92\,378\,c^{10}+972\,400\,c^9\,d\,x+4\,618\,900\,c^8\,d^2\,x^2+13\,041\,600\,c^7\,d^3\,x^3+$$
$$24\,249\,225\,c^6\,d^4\,x^4+31\,039\,008\,c^5\,d^5\,x^5+27\,713\,400\,c^4\,d^6\,x^6+$$
$$17\,054\,400\,c^3\,d^7\,x^7+6\,928\,350\,c^2\,d^8\,x^8+1\,679\,600\,c\,d^9\,x^9+184\,756\,d^{10}\,x^{10})\Big)$$

Problem 1333: Result more than twice size of optimal antiderivative.

$$\int \frac{(c+d\,x)^{10}}{(a+b\,x)^{22}}\,dx$$

Optimal (type 1, 279 leaves, 2 steps):

$$-\frac{(b\,c-a\,d)^{10}}{21\,b^{11}\,(a+b\,x)^{21}}-\frac{d\,(b\,c-a\,d)^9}{2\,b^{11}\,(a+b\,x)^{20}}-\frac{45\,d^2\,(b\,c-a\,d)^8}{19\,b^{11}\,(a+b\,x)^{19}}-$$
$$\frac{20\,d^3\,(b\,c-a\,d)^7}{3\,b^{11}\,(a+b\,x)^{18}}-\frac{210\,d^4\,(b\,c-a\,d)^6}{17\,b^{11}\,(a+b\,x)^{17}}-\frac{63\,d^5\,(b\,c-a\,d)^5}{4\,b^{11}\,(a+b\,x)^{16}}-\frac{14\,d^6\,(b\,c-a\,d)^4}{b^{11}\,(a+b\,x)^{15}}-$$
$$\frac{60\,d^7\,(b\,c-a\,d)^3}{7\,b^{11}\,(a+b\,x)^{14}}-\frac{45\,d^8\,(b\,c-a\,d)^2}{13\,b^{11}\,(a+b\,x)^{13}}-\frac{5\,d^9\,(b\,c-a\,d)}{6\,b^{11}\,(a+b\,x)^{12}}-\frac{d^{10}}{11\,b^{11}\,(a+b\,x)^{11}}$$

Result (type 1, 692 leaves):

$$-\frac{1}{3\,879\,876\, b^{11}\,(a+b\,x)^{21}}\Big(a^{10}\,d^{10}+a^{9}\,b\,d^{9}\,(11\,c+21\,d\,x)+3\,a^{8}\,b^{2}\,d^{8}\,(22\,c^{2}+77\,c\,d\,x+70\,d^{2}\,x^{2})+2\,a^{7}\,b^{3}\,d^{7}\,(143\,c^{3}+693\,c^{2}\,d\,x+1155\,c\,d^{2}\,x^{2}+665\,d^{3}\,x^{3})+7\,a^{6}\,b^{4}\,d^{6}\,(143\,c^{4}+858\,c^{3}\,d\,x+1980\,c^{2}\,d^{2}\,x^{2}+2090\,c\,d^{3}\,x^{3}+855\,d^{4}\,x^{4})+21\,a^{5}\,b^{5}\,d^{5}\,(143\,c^{5}+1001\,c^{4}\,d\,x+2860\,c^{3}\,d^{2}\,x^{2}+4180\,c^{2}\,d^{3}\,x^{3}+3135\,c\,d^{4}\,x^{4}+969\,d^{5}\,x^{5})+7\,a^{4}\,b^{6}\,d^{4}\,(1144\,c^{6}+9009\,c^{5}\,d\,x+30\,030\,c^{4}\,d^{2}\,x^{2}+54\,340\,c^{3}\,d^{3}\,x^{3}+56\,430\,c^{2}\,d^{4}\,x^{4}+31\,977\,c\,d^{5}\,x^{5}+7752\,d^{6}\,x^{6})+2\,a^{3}\,b^{7}\,d^{3}\,(9724\,c^{7}+84\,084\,c^{6}\,d\,x+315\,315\,c^{5}\,d^{2}\,x^{2}+665\,665\,c^{4}\,d^{3}\,x^{3}+855\,855\,c^{3}\,d^{4}\,x^{4}+671\,517\,c^{2}\,d^{5}\,x^{5}+298\,452\,c\,d^{6}\,x^{6}+58\,140\,d^{7}\,x^{7})+3\,a^{2}\,b^{8}\,d^{2}\,(14\,586\,c^{8}+136\,136\,c^{7}\,d\,x+560\,560\,c^{6}\,d^{2}\,x^{2}+1\,331\,330\,c^{5}\,d^{3}\,x^{3}+1\,996\,995\,c^{4}\,d^{4}\,x^{4}+1\,939\,938\,c^{3}\,d^{5}\,x^{5}+1\,193\,808\,c^{2}\,d^{6}\,x^{6}+426\,360\,c\,d^{7}\,x^{7}+67\,830\,d^{8}\,x^{8})+a\,b^{9}\,d\,(92\,378\,c^{9}+918\,918\,c^{8}\,d\,x+4\,084\,080\,c^{7}\,d^{2}\,x^{2}+10\,650\,640\,c^{6}\,d^{3}\,x^{3}+17\,972\,955\,c^{5}\,d^{4}\,x^{4}+20\,369\,349\,c^{4}\,d^{5}\,x^{5}+15\,519\,504\,c^{3}\,d^{6}\,x^{6}+7\,674\,480\,c^{2}\,d^{7}\,x^{7}+2\,238\,390\,c\,d^{8}\,x^{8}+293\,930\,d^{9}\,x^{9})+b^{10}\,(184\,756\,c^{10}+1\,939\,938\,c^{9}\,d\,x+9\,189\,180\,c^{8}\,d^{2}\,x^{2}+25\,865\,840\,c^{7}\,d^{3}\,x^{3}+47\,927\,880\,c^{6}\,d^{4}\,x^{4}+61\,108\,047\,c^{5}\,d^{5}\,x^{5}+54\,318\,264\,c^{4}\,d^{6}\,x^{6}+33\,256\,080\,c^{3}\,d^{7}\,x^{7}+13\,430\,340\,c^{2}\,d^{8}\,x^{8}+3\,233\,230\,c\,d^{9}\,x^{9}+352\,716\,d^{10}\,x^{10})\Big)$$

Problem 1362: Result more than twice size of optimal antiderivative.

$$\int \frac{(a+b\,x)^{9}}{(c+d\,x)^{8}}\,dx$$

Optimal (type 3, 232 leaves, 2 steps):

$$-\frac{b^{8}\,(8\,b\,c-9\,a\,d)\,x}{d^{9}}+\frac{b^{9}\,x^{2}}{2\,d^{8}}+\frac{(b\,c-a\,d)^{9}}{7\,d^{10}\,(c+d\,x)^{7}}-\frac{3\,b\,(b\,c-a\,d)^{8}}{2\,d^{10}\,(c+d\,x)^{6}}+\frac{36\,b^{2}\,(b\,c-a\,d)^{7}}{5\,d^{10}\,(c+d\,x)^{5}}-\frac{21\,b^{3}\,(b\,c-a\,d)^{6}}{d^{10}\,(c+d\,x)^{4}}+\frac{42\,b^{4}\,(b\,c-a\,d)^{5}}{d^{10}\,(c+d\,x)^{3}}-\frac{63\,b^{5}\,(b\,c-a\,d)^{4}}{d^{10}\,(c+d\,x)^{2}}+\frac{84\,b^{6}\,(b\,c-a\,d)^{3}}{d^{10}\,(c+d\,x)}+\frac{36\,b^{7}\,(b\,c-a\,d)^{2}\,\mathrm{Log}[c+d\,x]}{d^{10}}$$

Result (type 3, 584 leaves):

$$-\frac{1}{70\,d^{10}\,(c+d\,x)^{7}}\Big(10\,a^{9}\,d^{9}+15\,a^{8}\,b\,d^{8}\,(c+7\,d\,x)+24\,a^{7}\,b^{2}\,d^{7}\,(c^{2}+7\,c\,d\,x+21\,d^{2}\,x^{2})+42\,a^{6}\,b^{3}\,d^{6}\,(c^{3}+7\,c^{2}\,d\,x+21\,c\,d^{2}\,x^{2}+35\,d^{3}\,x^{3})+84\,a^{5}\,b^{4}\,d^{5}\,(c^{4}+7\,c^{3}\,d\,x+21\,c^{2}\,d^{2}\,x^{2}+35\,c\,d^{3}\,x^{3}+35\,d^{4}\,x^{4})+210\,a^{4}\,b^{5}\,d^{4}\,(c^{5}+7\,c^{4}\,d\,x+21\,c^{3}\,d^{2}\,x^{2}+35\,c^{2}\,d^{3}\,x^{3}+35\,c\,d^{4}\,x^{4}+21\,d^{5}\,x^{5})+840\,a^{3}\,b^{6}\,d^{3}\,(c^{6}+7\,c^{5}\,d\,x+21\,c^{4}\,d^{2}\,x^{2}+35\,c^{3}\,d^{3}\,x^{3}+35\,c^{2}\,d^{4}\,x^{4}+21\,c\,d^{5}\,x^{5}+7\,d^{6}\,x^{6})-6\,a^{2}\,b^{7}\,c\,d^{2}\,(1089\,c^{6}+7203\,c^{5}\,d\,x+20\,139\,c^{4}\,d^{2}\,x^{2}+30\,625\,c^{3}\,d^{3}\,x^{3}+26\,950\,c^{2}\,d^{4}\,x^{4}+13\,230\,c\,d^{5}\,x^{5}+2940\,d^{6}\,x^{6})+6\,a\,b^{8}\,d\,(1443\,c^{8}+9261\,c^{7}\,d\,x+24\,843\,c^{6}\,d^{2}\,x^{2}+35\,525\,c^{5}\,d^{3}\,x^{3}+28\,175\,c^{4}\,d^{4}\,x^{4}+11\,025\,c^{3}\,d^{5}\,x^{5}+735\,c^{2}\,d^{6}\,x^{6}-735\,c\,d^{7}\,x^{7}-105\,d^{8}\,x^{8})-b^{9}\,(3349\,c^{9}+20\,923\,c^{8}\,d\,x+53\,949\,c^{7}\,d^{2}\,x^{2}+72\,275\,c^{6}\,d^{3}\,x^{3}+50\,225\,c^{5}\,d^{4}\,x^{4}+12\,495\,c^{4}\,d^{5}\,x^{5}-4655\,c^{3}\,d^{6}\,x^{6}-3185\,c^{2}\,d^{7}\,x^{7}-315\,c\,d^{8}\,x^{8}+35\,d^{9}\,x^{9})-2520\,b^{7}\,(b\,c-a\,d)^{2}\,(c+d\,x)^{7}\,\mathrm{Log}[c+d\,x]\Big)$$

Problem 1363: Result more than twice size of optimal antiderivative.

$$\int \frac{(a+b\,x)^{8}}{(c+d\,x)^{8}}\,dx$$

Optimal (type 3, 209 leaves, 2 steps):

$$\frac{b^8 x}{d^8}-\frac{(b c-a d)^8}{7 d^9 (c+d x)^7}+\frac{4 b (b c-a d)^7}{3 d^9 (c+d x)^6}-\frac{28 b^2 (b c-a d)^6}{5 d^9 (c+d x)^5}+\frac{14 b^3 (b c-a d)^5}{d^9 (c+d x)^4}-\frac{70 b^4 (b c-a d)^4}{3 d^9 (c+d x)^3}+\frac{28 b^5 (b c-a d)^3}{d^9 (c+d x)^2}-\frac{28 b^6 (b c-a d)^2}{d^9 (c+d x)}-\frac{8 b^7 (b c-a d) \operatorname{Log}[c+d x]}{d^9}$$

Result (type 3, 474 leaves):

$$-\frac{1}{105 d^9 (c+d x)^7}\Big(15 a^8 d^8+20 a^7 b d^7 (c+7 d x)+28 a^6 b^2 d^6 (c^2+7 c d x+21 d^2 x^2)+42 a^5 b^3 d^5 (c^3+7 c^2 d x+21 c d^2 x^2+35 d^3 x^3)+70 a^4 b^4 d^4 (c^4+7 c^3 d x+21 c^2 d^2 x^2+35 c d^3 x^3+35 d^4 x^4)+140 a^3 b^5 d^3 (c^5+7 c^4 d x+21 c^3 d^2 x^2+35 c^2 d^3 x^3+35 c d^4 x^4+21 d^5 x^5)+420 a^2 b^6 d^2 (c^6+7 c^5 d x+21 c^4 d^2 x^2+35 c^3 d^3 x^3+35 c^2 d^4 x^4+21 c d^5 x^5+7 d^6 x^6)-2 a b^7 c d (1089 c^6+7203 c^5 d x+20139 c^4 d^2 x^2+30625 c^3 d^3 x^3+26950 c^2 d^4 x^4+13230 c d^5 x^5+2940 d^6 x^6)+b^8 (1443 c^8+9261 c^7 d x+24843 c^6 d^2 x^2+35525 c^5 d^3 x^3+28175 c^4 d^4 x^4+11025 c^3 d^5 x^5+735 c^2 d^6 x^6-735 c d^7 x^7-105 d^8 x^8)+840 b^7 (b c-a d) (c+d x)^7 \operatorname{Log}[c+d x]\Big)$$

Problem 1365: Result more than twice size of optimal antiderivative.

$$\int \frac{(a+b x)^6}{(c+d x)^8}\, dx$$

Optimal (type 1, 28 leaves, 1 step):

$$\frac{(a+b x)^7}{7 (b c-a d) (c+d x)^7}$$

Result (type 1, 271 leaves):

$$-\frac{1}{7 d^7 (c+d x)^7}\Big(a^6 d^6+a^5 b d^5 (c+7 d x)+a^4 b^2 d^4 (c^2+7 c d x+21 d^2 x^2)+a^3 b^3 d^3 (c^3+7 c^2 d x+21 c d^2 x^2+35 d^3 x^3)+a^2 b^4 d^2 (c^4+7 c^3 d x+21 c^2 d^2 x^2+35 c d^3 x^3+35 d^4 x^4)+a b^5 d (c^5+7 c^4 d x+21 c^3 d^2 x^2+35 c^2 d^3 x^3+35 c d^4 x^4+21 d^5 x^5)+b^6 (c^6+7 c^5 d x+21 c^4 d^2 x^2+35 c^3 d^3 x^3+35 c^2 d^4 x^4+21 c d^5 x^5+7 d^6 x^6)\Big)$$

Problem 1366: Result more than twice size of optimal antiderivative.

$$\int \frac{(a+b x)^5}{(c+d x)^8}\, dx$$

Optimal (type 1, 58 leaves, 2 steps):

$$\frac{(a+b x)^6}{7 (b c-a d) (c+d x)^7}+\frac{b (a+b x)^6}{42 (b c-a d)^2 (c+d x)^6}$$

Result (type 1, 205 leaves):

$$-\frac{1}{42\, d^6\, (c+d\, x)^7}\Big(6\, a^5\, d^5+5\, a^4\, b\, d^4\, (c+7\, d\, x)+4\, a^3\, b^2\, d^3\, (c^2+7\, c\, d\, x+21\, d^2\, x^2)+3\, a^2\, b^3\, d^2\, (c^3+7\, c^2\, d\, x+21\, c\, d^2\, x^2+35\, d^3\, x^3)+2\, a\, b^4\, d\, (c^4+7\, c^3\, d\, x+21\, c^2\, d^2\, x^2+35\, c\, d^3\, x^3+35\, d^4\, x^4)+b^5\, (c^5+7\, c^4\, d\, x+21\, c^3\, d^2\, x^2+35\, c^2\, d^3\, x^3+35\, c\, d^4\, x^4+21\, d^5\, x^5)\Big)$$

Problem 1453: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 14 leaves, 2 steps):

$$-\text{ArcTanh}\left[\frac{\sqrt{2+x}}{2}\right]$$

Result (type 3, 31 leaves):

$$\frac{1}{2}\,\text{Log}\left[2-\sqrt{2+x}\right]-\frac{1}{2}\,\text{Log}\left[2+\sqrt{2+x}\right]$$

Problem 1458: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a+b\, x)\,(c+d\, x)^{1/3}}\, dx$$

Optimal (type 3, 139 leaves, 4 steps):

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

Result (type 5, 47 leaves):

$$-\frac{3\,(c+d\, x)^{2/3}\,\text{Hypergeometric2F1}\left[\frac{2}{3},1,\frac{5}{3},\frac{b\,(c+d\, x)}{b\, c-a\, d}\right]}{2\, b\, c-2\, a\, d}$$

Problem 1459: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a+b\, x)\,(c+d\, x)^{2/3}}\, dx$$

Optimal (type 3, 140 leaves, 4 steps):

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

Result (type 5, 46 leaves):

$$-\frac{3\,(c+d\,x)^{1/3}\,\text{Hypergeometric2F1}\left[\frac{1}{3},1,\frac{4}{3},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]}{b\,c-a\,d}$$

Problem 1539: Result more than twice size of optimal antiderivative.

$$\int\frac{1}{\sqrt{-b\,x}\,\sqrt{2+b\,x}}\,dx$$

Optimal (type 3, 10 leaves, 3 steps):

$$\frac{\text{ArcSin}[1+b\,x]}{b}$$

Result (type 3, 51 leaves):

$$\frac{2\,\sqrt{x}\,\sqrt{2+b\,x}\,\text{ArcSinh}\left[\frac{\sqrt{b}\,\sqrt{x}}{\sqrt{2}}\right]}{\sqrt{b}\,\sqrt{-b\,x\,(2+b\,x)}}$$

Problem 1540: Result more than twice size of optimal antiderivative.

$$\int\frac{1}{\sqrt{-1-b\,x}\,\sqrt{2+b\,x}}\,dx$$

Optimal (type 3, 11 leaves, 3 steps):

$$\frac{\text{ArcSin}[3+2\,b\,x]}{b}$$

Result (type 3, 49 leaves):

$$\frac{2\,\sqrt{1+b\,x}\,\sqrt{2+b\,x}\,\text{ArcSinh}\left[\sqrt{1+b\,x}\right]}{b\,\sqrt{-(1+b\,x)\,(2+b\,x)}}$$

Problem 1550: Result more than twice size of optimal antiderivative.

$$\int\frac{1}{\sqrt{-4+b\,x}\,\sqrt{4+b\,x}}\,dx$$

Optimal (type 3, 11 leaves, 1 step):

$$\frac{\text{ArcCosh}\left[\frac{b\,x}{4}\right]}{b}$$

Result (type 3, 24 leaves):

$$\frac{2\,\text{ArcSinh}\left[\frac{\sqrt{-4+b\,x}}{2\,\sqrt{2}}\right]}{b}$$

Problem 1555: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{4-x}\,\sqrt{x}}\,dx$$

Optimal (type 3, 10 leaves, 3 steps):

$$-\text{ArcSin}\left[1-\frac{x}{2}\right]$$

Result (type 3, 38 leaves):

$$\frac{2\sqrt{-4+x}\,\sqrt{x}\,\text{Log}\left[\sqrt{-4+x}+\sqrt{x}\right]}{\sqrt{-(-4+x)\,x}}$$

Problem 1558: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\sqrt{a-b\,x}\,\sqrt{c+d\,x}}\,dx$$

Optimal (type 3, 43 leaves, 3 steps):

$$-\frac{2\,\text{ArcTan}\left[\frac{\sqrt{d}\,\sqrt{a-b\,x}}{\sqrt{b}\,\sqrt{c+d\,x}}\right]}{\sqrt{b}\,\sqrt{d}}$$

Result (type 3, 64 leaves):

$$\frac{i\,\text{Log}\left[2\sqrt{a-b\,x}\,\sqrt{c+d\,x}-\frac{i\,(b\,c-a\,d+2\,b\,d\,x)}{\sqrt{b}\,\sqrt{d}}\right]}{\sqrt{b}\,\sqrt{d}}$$

Problem 1559: Result unnecessarily involves higher level functions.

$$\int (a+b\,x)^{3/2}\,(c+d\,x)^{1/3}\,dx$$

Optimal (type 4, 457 leaves, 5 steps):

$$-\frac{108\,(b\,c-a\,d)^2\,\sqrt{a+b\,x}\,(c+d\,x)^{1/3}}{935\,b\,d^2}+\frac{12\,(b\,c-a\,d)\,(a+b\,x)^{3/2}\,(c+d\,x)^{1/3}}{187\,b\,d}+\frac{6\,(a+b\,x)^{5/2}\,(c+d\,x)^{1/3}}{17\,b}-\left(108\times 3^{3/4}\,\sqrt{2-\sqrt{3}}\,(b\,c-a\,d)^3\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)\sqrt{\frac{(b\,c-a\,d)^{2/3}+b^{1/3}\,(b\,c-a\,d)^{1/3}\,(c+d\,x)^{1/3}+b^{2/3}\,(c+d\,x)^{2/3}}{\left(\left(1-\sqrt{3}\right)(b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)(b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}}{\left(1-\sqrt{3}\right)(b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/\left(935\,b^{4/3}\,d^3\,\sqrt{a+b\,x}\,\sqrt{-\frac{(b\,c-a\,d)^{1/3}\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)(b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}\right)$$

Result (type 5, 142 leaves) :

$$-\frac{1}{935\,b\,d^3\,\sqrt{a+b\,x}}6\,(c+d\,x)^{1/3}\left(-d\,(a+b\,x)\,\left(27\,a^2\,d^2+2\,a\,b\,d\,(23\,c+50\,d\,x)+b^2\,\left(-18\,c^2+10\,c\,d\,x+55\,d^2\,x^2\right)\right)-27\,(b\,c-a\,d)^3\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{4}{3},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)$$

Problem 1560: Result unnecessarily involves higher level functions.

$$\int\sqrt{a+b\,x}\,(c+d\,x)^{1/3}\,dx$$

Optimal (type 4, 419 leaves, 4 steps) :

$$\frac{12\,(b\,c-a\,d)\,\sqrt{a+b\,x}\,(c+d\,x)^{1/3}}{55\,b\,d}+\frac{6\,(a+b\,x)^{3/2}\,(c+d\,x)^{1/3}}{11\,b}+\left(12\times 3^{3/4}\,\sqrt{2-\sqrt{3}}\,(b\,c-a\,d)^2\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)\sqrt{\frac{(b\,c-a\,d)^{2/3}+b^{1/3}\,(b\,c-a\,d)^{1/3}\,(c+d\,x)^{1/3}+b^{2/3}\,(c+d\,x)^{2/3}}{\left(\left(1-\sqrt{3}\right)\,(b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)\,(b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}}{\left(1-\sqrt{3}\right)\,(b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}}\right],\,-7+4\,\sqrt{3}\right]\right)\Bigg/\left(55\,b^{4/3}\,d^2\,\sqrt{a+b\,x}\,\sqrt{-\frac{(b\,c-a\,d)^{1/3}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)\,(b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}\right)$$

Result (type 5, 110 leaves):

$$\frac{1}{55\,b\,d^2\,\sqrt{a+b\,x}}6\,(c+d\,x)^{1/3}\left(d\,(a+b\,x)\,(2\,b\,c+3\,a\,d+5\,b\,d\,x)-3\,(b\,c-a\,d)^2\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\;\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{4}{3},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)$$

Problem 1561: Result unnecessarily involves higher level functions.

$$\int\frac{(c+d\,x)^{1/3}}{\sqrt{a+b\,x}}\,dx$$

Optimal (type 4, 381 leaves, 3 steps):

$$\frac{6\sqrt{a+b\,x}\ (c+d\,x)^{1/3}}{5\,b}-\left(4\times 3^{3/4}\sqrt{2-\sqrt{3}}\ (b\,c-a\,d)\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)\right.$$
$$\sqrt{\frac{(b\,c-a\,d)^{2/3}+b^{1/3}\,(b\,c-a\,d)^{1/3}\,(c+d\,x)^{1/3}+b^{2/3}\,(c+d\,x)^{2/3}}{\left(\left(1-\sqrt{3}\right)\,(b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)\,(b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}}{\left(1-\sqrt{3}\right)\,(b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}}\right],\,-7+4\sqrt{3}\right]\right)\Big/$$
$$\left(5\,b^{4/3}\,d\,\sqrt{a+b\,x}\ \sqrt{-\frac{(b\,c-a\,d)^{1/3}\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)\,(b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}\right)$$

Result (type 5, 93 leaves):

$$\frac{1}{5\,b\,d\,\sqrt{a+b\,x}}$$
$$6\,(c+d\,x)^{1/3}\left(d\,(a+b\,x)+(b\,c-a\,d)\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\ \text{Hypergeometric2F1}\left[\frac{1}{3},\,\frac{1}{2},\,\frac{4}{3},\,\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)$$

Problem 1562: Result unnecessarily involves higher level functions.

$$\int\frac{(c+d\,x)^{1/3}}{(a+b\,x)^{3/2}}\,dx$$

Optimal (type 4, 366 leaves, 3 steps):

$$-\frac{2\,(c+d\,x)^{1/3}}{b\,\sqrt{a+b\,x}}-\left(4\sqrt{2-\sqrt{3}}\ \left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)\right.$$
$$\sqrt{\frac{(b\,c-a\,d)^{2/3}+b^{1/3}\,(b\,c-a\,d)^{1/3}\,(c+d\,x)^{1/3}+b^{2/3}\,(c+d\,x)^{2/3}}{\left(\left(1-\sqrt{3}\right)\,(b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)\,(b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}}{\left(1-\sqrt{3}\right)\,(b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}}\right],\,-7+4\sqrt{3}\right]\right)\Big/$$
$$\left(3^{1/4}\,b^{4/3}\,\sqrt{a+b\,x}\ \sqrt{-\frac{(b\,c-a\,d)^{1/3}\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)\,(b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}\right)$$

Result (type 5, 74 leaves):

$$\frac{2\,(c+d\,x)^{1/3}\left(-1+\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\;\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{4}{3},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)}{b\,\sqrt{a+b\,x}}$$

Problem 1563: Result unnecessarily involves higher level functions.

$$\int \frac{(c+d\,x)^{1/3}}{(a+b\,x)^{5/2}}\,dx$$

Optimal (type 4, 417 leaves, 4 steps):

$$-\frac{2\,(c+d\,x)^{1/3}}{3\,b\,(a+b\,x)^{3/2}}-\frac{4\,d\,(c+d\,x)^{1/3}}{9\,b\,(b\,c-a\,d)\,\sqrt{a+b\,x}}+\left(4\,\sqrt{2-\sqrt{3}}\;d\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)\sqrt{\frac{(b\,c-a\,d)^{2/3}+b^{1/3}\,(b\,c-a\,d)^{1/3}\,(c+d\,x)^{1/3}+b^{2/3}\,(c+d\,x)^{2/3}}{\left(\left(1-\sqrt{3}\right)(b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)(b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}}{\left(1-\sqrt{3}\right)(b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}}\right],\,-7+4\,\sqrt{3}\right]\right)\Big/\left(9\times 3^{1/4}\,b^{4/3}\,(b\,c-a\,d)\,\sqrt{a+b\,x}\,\sqrt{-\frac{(b\,c-a\,d)^{1/3}\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)(b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}\right)$$

Result (type 5, 104 leaves):

$$\left(2\,(c+d\,x)^{1/3}\left(3\,b\,c-a\,d+2\,b\,d\,x+d\,(a+b\,x)\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\;\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{4}{3},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\right)\Big/\left(9\,b\,(-b\,c+a\,d)\,(a+b\,x)^{3/2}\right)$$

Problem 1564: Result unnecessarily involves higher level functions.

$$\int \frac{(c+d\,x)^{1/3}}{(a+b\,x)^{7/2}}\,dx$$

Optimal (type 4, 457 leaves, 5 steps):

$$-\frac{2\,(c+d\,x)^{1/3}}{5\,b\,(a+b\,x)^{5/2}}-\frac{4\,d\,(c+d\,x)^{1/3}}{45\,b\,(b\,c-a\,d)\,(a+b\,x)^{3/2}}+\frac{28\,d^2\,(c+d\,x)^{1/3}}{135\,b\,(b\,c-a\,d)^2\,\sqrt{a+b\,x}}-\left(28\,\sqrt{2-\sqrt{3}}\;d^2\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)\sqrt{\frac{(b\,c-a\,d)^{2/3}+b^{1/3}\,(b\,c-a\,d)^{1/3}\,(c+d\,x)^{1/3}+b^{2/3}\,(c+d\,x)^{2/3}}{\left(\left(1-\sqrt{3}\right)(b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)(b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}}{\left(1-\sqrt{3}\right)(b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}}\right],\,-7+4\,\sqrt{3}\right]\right)\Big/\left(135\times 3^{1/4}\,b^{4/3}\,(b\,c-a\,d)^2\,\sqrt{a+b\,x}\,\sqrt{-\frac{(b\,c-a\,d)^{1/3}\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)(b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}\right)$$

Result (type 5, 140 leaves):

$$\left(2\,(c+d\,x)^{1/3}\left(-7\,a^2\,d^2+2\,a\,b\,d\,(24\,c+17\,d\,x)+b^2\left(-27\,c^2-6\,c\,d\,x+14\,d^2\,x^2\right)+7\,d^2\,(a+b\,x)^2\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\;\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{4}{3},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\right)\Big/\left(135\,b\,(b\,c-a\,d)^2\,(a+b\,x)^{5/2}\right)$$

Problem 1565: Result unnecessarily involves higher level functions.

$$\int\frac{(a+b\,x)^{3/2}}{(c+d\,x)^{1/3}}\,dx$$

Optimal (type 4, 839 leaves, 6 steps):

$$-\frac{54\,(b c-a d)\,\sqrt{a+b x}\,(c+d x)^{2/3}}{91\,d^2}+\frac{6\,(a+b x)^{3/2}\,(c+d x)^{2/3}}{13\,d}-\frac{162\,(b c-a d)^2\,\sqrt{a+b x}}{91\,b^{2/3}\,d^2\,\left(\left(1-\sqrt{3}\right)(b c-a d)^{1/3}-b^{1/3}\,(c+d x)^{1/3}\right)}+$$

$$\left(81\times 3^{1/4}\,\sqrt{2+\sqrt{3}}\,(b c-a d)^{7/3}\,\left((b c-a d)^{1/3}-b^{1/3}\,(c+d x)^{1/3}\right)\right.$$

$$\sqrt{\frac{(b c-a d)^{2/3}+b^{1/3}\,(b c-a d)^{1/3}\,(c+d x)^{1/3}+b^{2/3}\,(c+d x)^{2/3}}{\left(\left(1-\sqrt{3}\right)(b c-a d)^{1/3}-b^{1/3}\,(c+d x)^{1/3}\right)^2}}$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)(b c-a d)^{1/3}-b^{1/3}\,(c+d x)^{1/3}}{\left(1-\sqrt{3}\right)(b c-a d)^{1/3}-b^{1/3}\,(c+d x)^{1/3}}\right],\,-7+4\sqrt{3}\right]\right)\Big/$$

$$\left(91\,b^{2/3}\,d^3\,\sqrt{a+b x}\,\sqrt{-\frac{(b c-a d)^{1/3}\,\left((b c-a d)^{1/3}-b^{1/3}\,(c+d x)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)(b c-a d)^{1/3}-b^{1/3}\,(c+d x)^{1/3}\right)^2}}\right)-$$

$$\left(54\,\sqrt{2}\,3^{3/4}\,(b c-a d)^{7/3}\,\left((b c-a d)^{1/3}-b^{1/3}\,(c+d x)^{1/3}\right)\right.$$

$$\sqrt{\frac{(b c-a d)^{2/3}+b^{1/3}\,(b c-a d)^{1/3}\,(c+d x)^{1/3}+b^{2/3}\,(c+d x)^{2/3}}{\left(\left(1-\sqrt{3}\right)(b c-a d)^{1/3}-b^{1/3}\,(c+d x)^{1/3}\right)^2}}$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)(b c-a d)^{1/3}-b^{1/3}\,(c+d x)^{1/3}}{\left(1-\sqrt{3}\right)(b c-a d)^{1/3}-b^{1/3}\,(c+d x)^{1/3}}\right],\,-7+4\sqrt{3}\right]\right)\Big/$$

$$\left(91\,b^{2/3}\,d^3\,\sqrt{a+b x}\,\sqrt{-\frac{(b c-a d)^{1/3}\,\left((b c-a d)^{1/3}-b^{1/3}\,(c+d x)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)(b c-a d)^{1/3}-b^{1/3}\,(c+d x)^{1/3}\right)^2}}\right)$$

Result (type 5, 108 leaves):

$$\frac{1}{182\,d^3\,\sqrt{a+b x}}3\,(c+d x)^{2/3}\left(4\,d\,(a+b x)\,(-9\,b c+16\,a d+7\,b d x)+\right.$$

$$\left.27\,(b c-a d)^2\,\sqrt{\frac{d\,(a+b x)}{-b c+a d}}\;\text{Hypergeometric2F1}\left[\frac{1}{2},\,\frac{2}{3},\,\frac{5}{3},\,\frac{b\,(c+d x)}{b c-a d}\right]\right)$$

Problem 1566: Result unnecessarily involves higher level functions.

$$\int \frac{\sqrt{a+b x}}{(c+d x)^{1/3}}\, dx$$

Optimal (type 4, 804 leaves, 5 steps):

$$\frac{6 \sqrt{a+b x}\,(c+d x)^{2/3}}{7 d}+\frac{18 (b c-a d) \sqrt{a+b x}}{7 b^{2/3} d \left(\left(1-\sqrt{3}\right) (b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)}-$$

$$\left(9\times 3^{1/4} \sqrt{2+\sqrt{3}}\,(b c-a d)^{4/3} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right) \sqrt{\frac{(b c-a d)^{2/3}+b^{1/3} (b c-a d)^{1/3} (c+d x)^{1/3}+b^{2/3} (c+d x)^{2/3}}{\left(\left(1-\sqrt{3}\right) (b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) (b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}}{\left(1-\sqrt{3}\right) (b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}}\right],-7+4 \sqrt{3}\right]\right)\Bigg/$$

$$\left(7 b^{2/3} d^2 \sqrt{a+b x} \sqrt{-\frac{(b c-a d)^{1/3} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) (b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)^2}}\right)+$$

$$\left(6 \sqrt{2}\, 3^{3/4} (b c-a d)^{4/3} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right) \sqrt{\frac{(b c-a d)^{2/3}+b^{1/3} (b c-a d)^{1/3} (c+d x)^{1/3}+b^{2/3} (c+d x)^{2/3}}{\left(\left(1-\sqrt{3}\right) (b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) (b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}}{\left(1-\sqrt{3}\right) (b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}}\right],-7+4 \sqrt{3}\right]\right)\Bigg/$$

$$\left(7 b^{2/3} d^2 \sqrt{a+b x} \sqrt{-\frac{(b c-a d)^{1/3} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) (b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)^2}}\right)$$

Result (type 5, 77 leaves):

$$\frac{3 \sqrt{a+b x}\,(c+d x)^{2/3} \left(4+\frac{3\, \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{2}{3},\frac{5}{3},\frac{b (c+d x)}{b c-a d}\right]}{\sqrt{\frac{d (a+b x)}{-b c+a d}}}\right)}{14 d}$$

Problem 1567: Result unnecessarily involves higher level functions.

$$\int \frac{1}{\sqrt{a+b x}\,(c+d x)^{1/3}}\, dx$$

Optimal (type 4, 762 leaves, 4 steps):

$$-\frac{6\sqrt{a+b x}}{b^{2/3}\left(\left(1-\sqrt{3}\right)(b c-a d)^{1/3}-b^{1/3}(c+d x)^{1/3}\right)}+$$

$$\left(3\times 3^{1/4}\sqrt{2+\sqrt{3}}\,(b c-a d)^{1/3}\left((b c-a d)^{1/3}-b^{1/3}(c+d x)^{1/3}\right)\right.$$

$$\sqrt{\frac{(b c-a d)^{2/3}+b^{1/3}(b c-a d)^{1/3}(c+d x)^{1/3}+b^{2/3}(c+d x)^{2/3}}{\left(\left(1-\sqrt{3}\right)(b c-a d)^{1/3}-b^{1/3}(c+d x)^{1/3}\right)^2}}$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)(b c-a d)^{1/3}-b^{1/3}(c+d x)^{1/3}}{\left(1-\sqrt{3}\right)(b c-a d)^{1/3}-b^{1/3}(c+d x)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$

$$\left(b^{2/3} d\sqrt{a+b x}\sqrt{-\frac{(b c-a d)^{1/3}\left((b c-a d)^{1/3}-b^{1/3}(c+d x)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)(b c-a d)^{1/3}-b^{1/3}(c+d x)^{1/3}\right)^2}}\right)-$$

$$\left(2\sqrt{2}\,3^{3/4}(b c-a d)^{1/3}\left((b c-a d)^{1/3}-b^{1/3}(c+d x)^{1/3}\right)\right.$$

$$\sqrt{\frac{(b c-a d)^{2/3}+b^{1/3}(b c-a d)^{1/3}(c+d x)^{1/3}+b^{2/3}(c+d x)^{2/3}}{\left(\left(1-\sqrt{3}\right)(b c-a d)^{1/3}-b^{1/3}(c+d x)^{1/3}\right)^2}}$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)(b c-a d)^{1/3}-b^{1/3}(c+d x)^{1/3}}{\left(1-\sqrt{3}\right)(b c-a d)^{1/3}-b^{1/3}(c+d x)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$

$$\left(b^{2/3} d\sqrt{a+b x}\sqrt{-\frac{(b c-a d)^{1/3}\left((b c-a d)^{1/3}-b^{1/3}(c+d x)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)(b c-a d)^{1/3}-b^{1/3}(c+d x)^{1/3}\right)^2}}\right)$$

Result (type 5, 73 leaves):

$$\frac{3\sqrt{\frac{d(a+b x)}{-b c+a d}}\,(c+d x)^{2/3}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{2}{3},\frac{5}{3},\frac{b(c+d x)}{b c-a d}\right]}{2 d\sqrt{a+b x}}$$

Problem 1568: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a+b x)^{3/2} (c+d x)^{1/3}} \, dx$$

Optimal (type 4, 796 leaves, 5 steps):

$$-\frac{2 (c+d x)^{2/3}}{(b c-a d) \sqrt{a+b x}}-\frac{2 d \sqrt{a+b x}}{b^{2/3} (b c-a d) \left(\left(1-\sqrt{3}\right) (b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)}+$$

$$\left(3^{1/4} \sqrt{2+\sqrt{3}} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)\right.$$

$$\sqrt{\frac{(b c-a d)^{2/3}+b^{1/3} (b c-a d)^{1/3} (c+d x)^{1/3}+b^{2/3} (c+d x)^{2/3}}{\left(\left(1-\sqrt{3}\right) (b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)^2}}$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) (b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}}{\left(1-\sqrt{3}\right) (b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}}\right],-7+4 \sqrt{3}\right]\right) \Bigg/$$

$$\left(b^{2/3} (b c-a d)^{2/3} \sqrt{a+b x} \sqrt{-\frac{(b c-a d)^{1/3} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) (b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)^2}}\right)-$$

$$\left(2 \sqrt{2} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)\right.$$

$$\sqrt{\frac{(b c-a d)^{2/3}+b^{1/3} (b c-a d)^{1/3} (c+d x)^{1/3}+b^{2/3} (c+d x)^{2/3}}{\left(\left(1-\sqrt{3}\right) (b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)^2}}$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) (b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}}{\left(1-\sqrt{3}\right) (b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}}\right],-7+4 \sqrt{3}\right]\right) \Bigg/$$

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

Result (type 5, 83 leaves):

$$\frac{(c+d x)^{2/3} \left(-4+\sqrt{\frac{d (a+b x)}{-b c+a d}} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{2}{3},\frac{5}{3},\frac{b (c+d x)}{b c-a d}\right]\right)}{2 (b c-a d) \sqrt{a+b x}}$$

Problem 1569: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a+b x)^{5/2} (c+d x)^{1/3}} \, dx$$

Optimal (type 4, 842 leaves, 6 steps):

$$-\frac{2 (c+d x)^{2/3}}{3 (b c-a d) (a+b x)^{3/2}}+\frac{10 d (c+d x)^{2/3}}{9 (b c-a d)^2 \sqrt{a+b x}}+\frac{10 d^2 \sqrt{a+b x}}{9 b^{2/3} (b c-a d)^2 \left(\left(1-\sqrt{3}\right) (b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)}-\left(5 \sqrt{2+\sqrt{3}}\, d \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right) \sqrt{\frac{(b c-a d)^{2/3}+b^{1/3} (b c-a d)^{1/3} (c+d x)^{1/3}+b^{2/3} (c+d x)^{2/3}}{\left(\left(1-\sqrt{3}\right) (b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)^2}}\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) (b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}}{\left(1-\sqrt{3}\right) (b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}}\right], -7+4 \sqrt{3}\right]\right) \Bigg/ \left(3 \times 3^{3/4} b^{2/3} (b c-a d)^{5/3} \sqrt{a+b x} \sqrt{-\frac{(b c-a d)^{1/3} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) (b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)^2}}\right)+\left(10 \sqrt{2}\, d \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right) \sqrt{\frac{(b c-a d)^{2/3}+b^{1/3} (b c-a d)^{1/3} (c+d x)^{1/3}+b^{2/3} (c+d x)^{2/3}}{\left(\left(1-\sqrt{3}\right) (b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)^2}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) (b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}}{\left(1-\sqrt{3}\right) (b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}}\right], -7+4 \sqrt{3}\right]\right) \Bigg/ \left(9 \times 3^{1/4} b^{2/3} (b c-a d)^{5/3} \sqrt{a+b x} \sqrt{-\frac{(b c-a d)^{1/3} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) (b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)^2}}\right)$$

Result (type 5, 105 leaves):

$$\left((c+d x)^{2/3}\left(4\left(-3 b c+8 a d+5 b d x\right)-5 d (a+b x)\sqrt{\frac{d (a+b x)}{-b c+a d}}\right.\right.$$
$$\left.\left.\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{2}{3},\frac{5}{3},\frac{b (c+d x)}{b c-a d}\right]\right)\right)\Big/\left(18 (b c-a d)^2 (a+b x)^{3/2}\right)$$

Problem 1570: Result unnecessarily involves higher level functions.

$$\int \frac{(a+b x)^{3/2}}{(c+d x)^{2/3}}\, dx$$

Optimal (type 4, 416 leaves, 4 steps):

$$-\frac{54 (b c-a d)\sqrt{a+b x}\,(c+d x)^{1/3}}{55 d^2}+\frac{6 (a+b x)^{3/2} (c+d x)^{1/3}}{11 d}-$$
$$\left(54\times 3^{3/4}\sqrt{2-\sqrt{3}}\,(b c-a d)^2\left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)\right.$$
$$\sqrt{\frac{(b c-a d)^{2/3}+b^{1/3} (b c-a d)^{1/3} (c+d x)^{1/3}+b^{2/3} (c+d x)^{2/3}}{\left(\left(1-\sqrt{3}\right) (b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)^2}}$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) (b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}}{\left(1-\sqrt{3}\right) (b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$
$$\left(55 b^{1/3} d^3\sqrt{a+b x}\,\sqrt{-\frac{(b c-a d)^{1/3}\left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) (b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)^2}}\right)$$

Result (type 5, 108 leaves):

$$\frac{1}{55 d^3\sqrt{a+b x}}3 (c+d x)^{1/3}\left(2 d (a+b x)\left(-9 b c+14 a d+5 b d x\right)+\right.$$
$$\left.27 (b c-a d)^2\sqrt{\frac{d (a+b x)}{-b c+a d}}\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{4}{3},\frac{b (c+d x)}{b c-a d}\right]\right)$$

Problem 1571: Result unnecessarily involves higher level functions.

$$\int \frac{\sqrt{a+b x}}{(c+d x)^{2/3}}\, dx$$

Optimal (type 4, 381 leaves, 3 steps):

$$\frac{6\sqrt{a+bx}\,(c+dx)^{1/3}}{5d}+\left(6\times 3^{3/4}\sqrt{2-\sqrt{3}}\,(bc-ad)\left((bc-ad)^{1/3}-b^{1/3}(c+dx)^{1/3}\right)\sqrt{\frac{(bc-ad)^{2/3}+b^{1/3}(bc-ad)^{1/3}(c+dx)^{1/3}+b^{2/3}(c+dx)^{2/3}}{\left(\left(1-\sqrt{3}\right)(bc-ad)^{1/3}-b^{1/3}(c+dx)^{1/3}\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)(bc-ad)^{1/3}-b^{1/3}(c+dx)^{1/3}}{\left(1-\sqrt{3}\right)(bc-ad)^{1/3}-b^{1/3}(c+dx)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/\left(5b^{1/3}d^2\sqrt{a+bx}\sqrt{-\frac{(bc-ad)^{1/3}\left((bc-ad)^{1/3}-b^{1/3}(c+dx)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)(bc-ad)^{1/3}-b^{1/3}(c+dx)^{1/3}\right)^2}}\right)$$

Result (type 5, 77 leaves):

$$\frac{3\sqrt{a+bx}\,(c+dx)^{1/3}\left(2+\frac{3\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{4}{3},\frac{b(c+dx)}{bc-ad}\right]}{\sqrt{\frac{d(a+bx)}{-bc+ad}}}\right)}{5d}$$

Problem 1572: Result unnecessarily involves higher level functions.

$$\int\frac{1}{\sqrt{a+bx}\,(c+dx)^{2/3}}\,dx$$

Optimal (type 4, 345 leaves, 2 steps):

$$-\left(\left(2\times 3^{3/4}\sqrt{2-\sqrt{3}}\left((bc-ad)^{1/3}-b^{1/3}(c+dx)^{1/3}\right)\sqrt{\frac{(bc-ad)^{2/3}+b^{1/3}(bc-ad)^{1/3}(c+dx)^{1/3}+b^{2/3}(c+dx)^{2/3}}{\left(\left(1-\sqrt{3}\right)(bc-ad)^{1/3}-b^{1/3}(c+dx)^{1/3}\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)(bc-ad)^{1/3}-b^{1/3}(c+dx)^{1/3}}{\left(1-\sqrt{3}\right)(bc-ad)^{1/3}-b^{1/3}(c+dx)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/\left(b^{1/3}d\sqrt{a+bx}\sqrt{-\frac{(bc-ad)^{1/3}\left((bc-ad)^{1/3}-b^{1/3}(c+dx)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)(bc-ad)^{1/3}-b^{1/3}(c+dx)^{1/3}\right)^2}}\right)\right)$$

Result (type 5, 71 leaves):

$$\frac{3\sqrt{\frac{d(a+bx)}{-bc+ad}}\,(c+dx)^{1/3}\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{4}{3},\frac{b(c+dx)}{bc-ad}\right]}{d\sqrt{a+bx}}$$

Problem 1573: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a+bx)^{3/2}\,(c+dx)^{2/3}}\,dx$$

Optimal (type 4, 383 leaves, 3 steps):

$$-\frac{2\,(c+dx)^{1/3}}{(bc-ad)\sqrt{a+bx}}+\left(2\sqrt{2-\sqrt{3}}\,\left((bc-ad)^{1/3}-b^{1/3}(c+dx)^{1/3}\right)\sqrt{\frac{(bc-ad)^{2/3}+b^{1/3}(bc-ad)^{1/3}(c+dx)^{1/3}+b^{2/3}(c+dx)^{2/3}}{\left(\left(1-\sqrt{3}\right)(bc-ad)^{1/3}-b^{1/3}(c+dx)^{1/3}\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)(bc-ad)^{1/3}-b^{1/3}(c+dx)^{1/3}}{\left(1-\sqrt{3}\right)(bc-ad)^{1/3}-b^{1/3}(c+dx)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/\left(3^{1/4}\,b^{1/3}\,(bc-ad)\sqrt{a+bx}\,\sqrt{-\frac{(bc-ad)^{1/3}\left((bc-ad)^{1/3}-b^{1/3}(c+dx)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)(bc-ad)^{1/3}-b^{1/3}(c+dx)^{1/3}\right)^2}}\right)$$

Result (type 5, 81 leaves):

$$-\frac{(c+dx)^{1/3}\left(2+\sqrt{\frac{d(a+bx)}{-bc+ad}}\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{4}{3},\frac{b(c+dx)}{bc-ad}\right]\right)}{(bc-ad)\sqrt{a+bx}}$$

Problem 1574: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a+bx)^{5/2}\,(c+dx)^{2/3}}\,dx$$

Optimal (type 4, 421 leaves, 4 steps):

$$-\frac{2\,(c+d\,x)^{1/3}}{3\,(b\,c-a\,d)\,(a+b\,x)^{3/2}}+\frac{14\,d\,(c+d\,x)^{1/3}}{9\,(b\,c-a\,d)^2\,\sqrt{a+b\,x}}-\left(14\,\sqrt{2-\sqrt{3}}\;d\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)\sqrt{\frac{(b\,c-a\,d)^{2/3}+b^{1/3}\,(b\,c-a\,d)^{1/3}\,(c+d\,x)^{1/3}+b^{2/3}\,(c+d\,x)^{2/3}}{\left(\left(1-\sqrt{3}\right)\,(b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)\,(b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}}{\left(1-\sqrt{3}\right)\,(b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}}\right],\,-7+4\,\sqrt{3}\right]\right)\Bigg/\left(9\times 3^{1/4}\,b^{1/3}\,(b\,c-a\,d)^2\,\sqrt{a+b\,x}\,\sqrt{-\frac{(b\,c-a\,d)^{1/3}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)\,(b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}\right)$$

Result (type 5, 102 leaves):

$$\left((c+d\,x)^{1/3}\left(-6\,b\,c+20\,a\,d+14\,b\,d\,x+7\,d\,(a+b\,x)\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\;\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{4}{3},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\right)\Bigg/\left(9\,(b\,c-a\,d)^2\,(a+b\,x)^{3/2}\right)$$

Problem 1575: Result unnecessarily involves higher level functions.

$$\int (a+b\,x)^{2/3}\,(c+d\,x)^{1/3}\,dx$$

Optimal (type 3, 219 leaves, 3 steps):

$$\frac{(b\,c-a\,d)\,(a+b\,x)^{2/3}\,(c+d\,x)^{1/3}}{6\,b\,d}+\frac{(a+b\,x)^{5/3}\,(c+d\,x)^{1/3}}{2\,b}+\frac{(b\,c-a\,d)^2\,\text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2\,d^{1/3}\,(a+b\,x)^{1/3}}{\sqrt{3}\,b^{1/3}\,(c+d\,x)^{1/3}}\right]}{3\,\sqrt{3}\,b^{4/3}\,d^{5/3}}+\frac{(b\,c-a\,d)^2\,\text{Log}[c+d\,x]}{18\,b^{4/3}\,d^{5/3}}+\frac{(b\,c-a\,d)^2\,\text{Log}\left[-1+\frac{d^{1/3}\,(a+b\,x)^{1/3}}{b^{1/3}\,(c+d\,x)^{1/3}}\right]}{6\,b^{4/3}\,d^{5/3}}$$

Result (type 5, 109 leaves):

$$\frac{1}{6\,b\,d^2\,(a+b\,x)^{1/3}}(c+d\,x)^{1/3}\left(d\,(a+b\,x)\,(2\,a\,d+b\,(c+3\,d\,x))-2\,(b\,c-a\,d)^2\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{1/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)$$

Problem 1576: Result unnecessarily involves higher level functions.

$$\int \frac{(c+d x)^{1/3}}{(a+b x)^{1/3}} \, dx$$

Optimal (type 3, 172 leaves, 2 steps):

$$\frac{(a+b x)^{2/3} (c+d x)^{1/3}}{b} - \frac{(b c-a d) \operatorname{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2 d^{1/3} (a+b x)^{1/3}}{\sqrt{3} b^{1/3} (c+d x)^{1/3}}\right]}{\sqrt{3} b^{4/3} d^{2/3}} - \frac{(b c-a d) \operatorname{Log}[c+d x]}{6 b^{4/3} d^{2/3}} - \frac{(b c-a d) \operatorname{Log}\left[-1+\frac{d^{1/3} (a+b x)^{1/3}}{b^{1/3} (c+d x)^{1/3}}\right]}{2 b^{4/3} d^{2/3}}$$

Result (type 5, 90 leaves):

$$\frac{1}{b d (a+b x)^{1/3}} (c+d x)^{1/3} \left(d (a+b x)+(b c-a d) \left(\frac{d (a+b x)}{-b c+a d}\right)^{1/3} \text{Hypergeometric2F1}\left[\frac{1}{3}, \frac{1}{3}, \frac{4}{3}, \frac{b (c+d x)}{b c-a d}\right]\right)$$

Problem 1577: Result unnecessarily involves higher level functions.

$$\int \frac{(c+d x)^{1/3}}{(a+b x)^{4/3}} \, dx$$

Optimal (type 3, 149 leaves, 2 steps):

$$-\frac{3 (c+d x)^{1/3}}{b (a+b x)^{1/3}} - \frac{\sqrt{3} d^{1/3} \operatorname{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2 d^{1/3} (a+b x)^{1/3}}{\sqrt{3} b^{1/3} (c+d x)^{1/3}}\right]}{b^{4/3}} - \frac{d^{1/3} \operatorname{Log}[c+d x]}{2 b^{4/3}} - \frac{3 d^{1/3} \operatorname{Log}\left[-1+\frac{d^{1/3} (a+b x)^{1/3}}{b^{1/3} (c+d x)^{1/3}}\right]}{2 b^{4/3}}$$

Result (type 5, 74 leaves):

$$\frac{1}{b (a+b x)^{1/3}} 3 (c+d x)^{1/3} \left(-1+\left(\frac{d (a+b x)}{-b c+a d}\right)^{1/3} \text{Hypergeometric2F1}\left[\frac{1}{3}, \frac{1}{3}, \frac{4}{3}, \frac{b (c+d x)}{b c-a d}\right]\right)$$

Problem 1582: Result unnecessarily involves higher level functions.

$$\int (a+b x)^{4/3} (c+d x)^{1/3} \, dx$$

Optimal (type 4, 655 leaves, 6 steps):

$$-\frac{3\,(b\,c-a\,d)^2\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}}{20\,b\,d^2}+\frac{3\,(b\,c-a\,d)\,(a+b\,x)^{4/3}\,(c+d\,x)^{1/3}}{40\,b\,d}+$$

$$\frac{3\,(a+b\,x)^{7/3}\,(c+d\,x)^{1/3}}{8\,b}+\Bigg(3^{3/4}\,\sqrt{2+\sqrt{3}}\,(b\,c-a\,d)^3\,\big((a+b\,x)\,(c+d\,x)\big)^{2/3}$$

$$\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\,\Big((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)$$

$$\sqrt{\Big(\Big((b\,c-a\,d)^{4/3}-2^{2/3}\,b^{1/3}\,d^{1/3}\,(b\,c-a\,d)^{2/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}+2\times 2^{1/3}\,b^{2/3}\,d^{2/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{2/3}\Big)\Big/\Big(\big(1+\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)^2\Big)}\;\text{EllipticF}\Big[$$

$$\text{ArcSin}\Big[\frac{\big(1-\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}}{\big(1+\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}}\Big],\,-7-4\,\sqrt{3}\Big]\Bigg)\Bigg/$$

$$\Bigg(10\times 2^{2/3}\,b^{4/3}\,d^{7/3}\,(a+b\,x)^{2/3}\,(c+d\,x)^{2/3}\,(b\,c+a\,d+2\,b\,d\,x)$$

$$\sqrt{\Big((b\,c-a\,d)^{2/3}\,\Big((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)\Big)\Big/\Big(\big(1+\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)^2}\;\sqrt{\big(a\,d+b\,(c+2\,d\,x)\big)^2}\Bigg)$$

Result (type 5, 140 leaves) :

$$-\Bigg(\Bigg(3\,(c+d\,x)^{1/3}\,\Bigg(-d\,(a+b\,x)\,\big(2\,a^2\,d^2+a\,b\,d\,(5\,c+9\,d\,x)+b^2\,(-2\,c^2+c\,d\,x+5\,d^2\,x^2)\big)-2\,(b\,c-a\,d)^3$$

$$\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{2/3}\,\text{Hypergeometric2F1}\Big[\frac{1}{3},\,\frac{2}{3},\,\frac{4}{3},\,\frac{b\,(c+d\,x)}{b\,c-a\,d}\Big]\Bigg)\Bigg)\Bigg/\left(40\,b\,d^3\,(a+b\,x)^{2/3}\right)\Bigg)$$

Problem 1583: Result unnecessarily involves higher level functions.

$$\int (a+b\,x)^{1/3}\,(c+d\,x)^{1/3}\,dx$$

Optimal (type 4, 617 leaves, 5 steps) :

$$\frac{3\,(b\,c-a\,d)\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}}{10\,b\,d}+\frac{3\,(a+b\,x)^{4/3}\,(c+d\,x)^{1/3}}{5\,b}-$$
$$\Bigg(3^{3/4}\sqrt{2+\sqrt{3}}\,(b\,c-a\,d)^2\,((a+b\,x)\,(c+d\,x))^{2/3}$$
$$\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\,\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}\right)$$
$$\sqrt{\Bigg(\Big((b\,c-a\,d)^{4/3}-2^{2/3}\,b^{1/3}\,d^{1/3}\,(b\,c-a\,d)^{2/3}\,((a+b\,x)\,(c+d\,x))^{1/3}+}$$
$$2\times 2^{1/3}\,b^{2/3}\,d^{2/3}\,((a+b\,x)\,(c+d\,x))^{2/3}\Big)\Big/$$
$$\Big(\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}\Big)^2\Bigg)}\;\text{EllipticF}\Big[$$
$$\text{ArcSin}\Big[\frac{\left(1-\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}}{\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}}\Big],\,-7-4\sqrt{3}\Big]\Bigg)\Big/$$
$$\Bigg(5\times 2^{2/3}\,b^{4/3}\,d^{4/3}\,(a+b\,x)^{2/3}\,(c+d\,x)^{2/3}\,(b\,c+a\,d+2\,b\,d\,x)$$
$$\sqrt{\Bigg(\Big((b\,c-a\,d)^{2/3}\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}\right)\Big)\Big/}$$
$$\Big(\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}\Big)^2\Bigg)}\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\Bigg)$$

Result (type 5, 108 leaves) :

$$\Bigg(3\,(c+d\,x)^{1/3}\Bigg(d\,(a+b\,x)\,(a\,d+b\,(c+2\,d\,x))-(b\,c-a\,d)^2\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{2/3}$$
$$\text{Hypergeometric2F1}\Big[\frac{1}{3},\frac{2}{3},\frac{4}{3},\frac{b\,(c+d\,x)}{b\,c-a\,d}\Big]\Bigg)\Bigg)\Big/\left(10\,b\,d^2\,(a+b\,x)^{2/3}\right)$$

Problem 1584: Result unnecessarily involves higher level functions.

$$\int\frac{(c+d\,x)^{1/3}}{(a+b\,x)^{2/3}}\,dx$$

Optimal (type 4, 576 leaves, 4 steps) :

$$\frac{3\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}}{2\,b}+\Bigg(3^{3/4}\,\sqrt{2+\sqrt{3}}\,\left(b\,c-a\,d\right)\,\left(\left(a+b\,x\right)\,\left(c+d\,x\right)\right)^{2/3}\,\sqrt{\left(b\,c+a\,d+2\,b\,d\,x\right)^{2}}\,\left(\left(b\,c-a\,d\right)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left(\left(a+b\,x\right)\,\left(c+d\,x\right)\right)^{1/3}\right)\,\sqrt{\left(\left(\left(b\,c-a\,d\right)^{4/3}-2^{2/3}\,b^{1/3}\,d^{1/3}\,\left(b\,c-a\,d\right)^{2/3}\,\left(\left(a+b\,x\right)\,\left(c+d\,x\right)\right)^{1/3}+2\times 2^{1/3}\,b^{2/3}\,d^{2/3}\,\left(\left(a+b\,x\right)\,\left(c+d\,x\right)\right)^{2/3}\right)\Big/\left(\left(1+\sqrt{3}\right)\,\left(b\,c-a\,d\right)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left(\left(a+b\,x\right)\,\left(c+d\,x\right)\right)^{1/3}\right)^{2}\right)}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)\,\left(b\,c-a\,d\right)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left(\left(a+b\,x\right)\,\left(c+d\,x\right)\right)^{1/3}}{\left(1+\sqrt{3}\right)\,\left(b\,c-a\,d\right)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left(\left(a+b\,x\right)\,\left(c+d\,x\right)\right)^{1/3}}\right],-7-4\,\sqrt{3}\right]\Bigg)\Bigg/\Bigg(2^{2/3}\,b^{4/3}\,d^{1/3}\,\left(a+b\,x\right)^{2/3}\,\left(c+d\,x\right)^{2/3}\,\left(b\,c+a\,d+2\,b\,d\,x\right)\,\sqrt{\left(\left(b\,c-a\,d\right)^{2/3}\,\left(\left(b\,c-a\,d\right)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left(\left(a+b\,x\right)\,\left(c+d\,x\right)\right)^{1/3}\right)\right)\Big/\left(\left(1+\sqrt{3}\right)\,\left(b\,c-a\,d\right)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left(\left(a+b\,x\right)\,\left(c+d\,x\right)\right)^{1/3}\right)^{2}}\,\sqrt{\left(a\,d+b\,\left(c+2\,d\,x\right)\right)^{2}}\Bigg)$$

Result (type 5, 93 leaves):

$$\frac{1}{2\,b\,d\,\left(a+b\,x\right)^{2/3}}\,3\,\left(c+d\,x\right)^{1/3}\,\left(d\,\left(a+b\,x\right)+\left(b\,c-a\,d\right)\,\left(\frac{d\,\left(a+b\,x\right)}{-b\,c+a\,d}\right)^{2/3}\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{4}{3},\frac{b\,\left(c+d\,x\right)}{b\,c-a\,d}\right]\right)$$

Problem 1585: Result unnecessarily involves higher level functions.

$$\int\frac{\left(c+d\,x\right)^{1/3}}{\left(a+b\,x\right)^{5/3}}\,dx$$

Optimal (type 4, 568 leaves, 4 steps):

$$-\frac{3\,(c+d\,x)^{1/3}}{2\,b\,(a+b\,x)^{2/3}}+\Bigg(3^{3/4}\,\sqrt{2+\sqrt{3}}\;d^{2/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{2/3}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\,\Big((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)\,\sqrt{\Big(\Big((b\,c-a\,d)^{4/3}-2^{2/3}\,b^{1/3}\,d^{1/3}\,(b\,c-a\,d)^{2/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}+2\times 2^{1/3}\,b^{2/3}\,d^{2/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{2/3}\Big)\Big/\Big(\big(1+\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)^2\Big)}\;\text{EllipticF}\Big[\text{ArcSin}\Big[\frac{\big(1-\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}}{\big(1+\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}}\Big],\,-7-4\,\sqrt{3}\Big]\Bigg)\Big/\Bigg(2^{2/3}\,b^{4/3}\,(a+b\,x)^{2/3}\,(c+d\,x)^{2/3}\,(b\,c+a\,d+2\,b\,d\,x)\,\sqrt{\Big(\Big((b\,c-a\,d)^{2/3}\,\Big((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)\Big)\Big/\Big(\big(1+\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)^2\Big)}\,\sqrt{\big(a\,d+b\,(c+2\,d\,x)\big)^2}\Bigg)$$

Result (type 5, 76 leaves):

$$\frac{1}{2\,b\,(a+b\,x)^{2/3}}3\,(c+d\,x)^{1/3}\left(-1+\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{2/3}\text{Hypergeometric2F1}\Big[\frac{1}{3},\,\frac{2}{3},\,\frac{4}{3},\,\frac{b\,(c+d\,x)}{b\,c-a\,d}\Big]\right)$$

Problem 1586: Result unnecessarily involves higher level functions.

$$\int\frac{(c+d\,x)^{1/3}}{(a+b\,x)^{8/3}}\,dx$$

Optimal (type 4, 617 leaves, 5 steps):

$$-\frac{3 (c+d x)^{1/3}}{5 b (a+b x)^{5/3}}-\frac{3 d (c+d x)^{1/3}}{10 b (b c-a d) (a+b x)^{2/3}}-\left(3^{3/4} \sqrt{2+\sqrt{3}}\, d^{5/3} \left((a+b x) (c+d x)\right)^{2/3} \sqrt{(b c+a d+2 b d x)^2}\right.$$
$$\left((b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} \left((a+b x) (c+d x)\right)^{1/3}\right)$$
$$\sqrt{\left(\left((b c-a d)^{4/3}-2^{2/3} b^{1/3} d^{1/3} (b c-a d)^{2/3} \left((a+b x) (c+d x)\right)^{1/3}+\right.\right.}$$
$$\left.2\times 2^{1/3} b^{2/3} d^{2/3} \left((a+b x) (c+d x)\right)^{2/3}\right)\Big/$$
$$\left.\left(\left(1+\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} \left((a+b x) (c+d x)\right)^{1/3}\right)^2\right) \text{EllipticF}\Big[$$
$$\left.\text{ArcSin}\Big[\frac{\left(1-\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} \left((a+b x) (c+d x)\right)^{1/3}}{\left(1+\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} \left((a+b x) (c+d x)\right)^{1/3}}\Big],-7-4 \sqrt{3}\Big]\right)\Big/$$
$$\left(5\times 2^{2/3} b^{4/3} (b c-a d) (a+b x)^{2/3} (c+d x)^{2/3} (b c+a d+2 b d x)\right.$$
$$\sqrt{\left((b c-a d)^{2/3} \left((b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} \left((a+b x) (c+d x)\right)^{1/3}\right)\right)\Big/}$$
$$\left.\overline{\left(\left(1+\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} \left((a+b x) (c+d x)\right)^{1/3}\right)^2} \sqrt{(a d+b (c+2 d x))^2}\right)$$

Result (type 5, 103 leaves):

$$\left(3 (c+d x)^{1/3} \left(2 b c-a d+b d x+d (a+b x) \left(\frac{d (a+b x)}{-b c+a d}\right)^{2/3} \text{Hypergeometric2F1}\Big[\frac{1}{3},\frac{2}{3},\frac{4}{3},\frac{b (c+d x)}{b c-a d}\Big]\right)\right)\Big/ \left(10 b (-b c+a d) (a+b x)^{5/3}\right)$$

Problem 1587: Result unnecessarily involves higher level functions.

$$\int \frac{(a+b x)^{4/3}}{(c+d x)^{1/3}}\, dx$$

Optimal (type 3, 216 leaves, 3 steps):

$$-\frac{2 (b c-a d) (a+b x)^{1/3} (c+d x)^{2/3}}{3 d^2}+\frac{(a+b x)^{4/3} (c+d x)^{2/3}}{2 d}-\frac{2 (b c-a d)^2 \text{ArcTan}\Big[\frac{1}{\sqrt{3}}+\frac{2 b^{1/3} (c+d x)^{1/3}}{\sqrt{3}\, d^{1/3} (a+b x)^{1/3}}\Big]}{3 \sqrt{3}\, b^{2/3} d^{7/3}}-\frac{(b c-a d)^2 \text{Log}[a+b x]}{9 b^{2/3} d^{7/3}}-\frac{(b c-a d)^2 \text{Log}\Big[-1+\frac{b^{1/3} (c+d x)^{1/3}}{d^{1/3} (a+b x)^{1/3}}\Big]}{3 b^{2/3} d^{7/3}}$$

Result (type 5, 107 leaves):

$$\frac{1}{6\, d^3\, (a+b\, x)^{2/3}} (c+d\, x)^{2/3} \left(d\, (a+b\, x)\, (-4\, b\, c+7\, a\, d+3\, b\, d\, x) + 2\, (b\, c-a\, d)^2 \left(\frac{d\, (a+b\, x)}{-b\, c+a\, d}\right)^{2/3} \text{Hypergeometric2F1}\left[\frac{2}{3}, \frac{2}{3}, \frac{5}{3}, \frac{b\, (c+d\, x)}{b\, c-a\, d}\right]\right)$$

Problem 1588: Result unnecessarily involves higher level functions.

$$\int \frac{(a+b\, x)^{1/3}}{(c+d\, x)^{1/3}}\, dx$$

Optimal (type 3, 171 leaves, 2 steps):

$$\frac{(a+b\, x)^{1/3}\, (c+d\, x)^{2/3}}{d} + \frac{(b\, c-a\, d)\, \text{ArcTan}\left[\frac{1}{\sqrt{3}} + \frac{2\, b^{1/3}\, (c+d\, x)^{1/3}}{\sqrt{3}\, d^{1/3}\, (a+b\, x)^{1/3}}\right]}{\sqrt{3}\, b^{2/3}\, d^{4/3}} + \frac{(b\, c-a\, d)\, \text{Log}[a+b\, x]}{6\, b^{2/3}\, d^{4/3}} + \frac{(b\, c-a\, d)\, \text{Log}\left[-1+\frac{b^{1/3}\, (c+d\, x)^{1/3}}{d^{1/3}\, (a+b\, x)^{1/3}}\right]}{2\, b^{2/3}\, d^{4/3}}$$

Result (type 5, 76 leaves):

$$\frac{(a+b\, x)^{1/3}\, (c+d\, x)^{2/3} \left(2+\frac{\text{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},\frac{b\, (c+d\, x)}{b\, c-a\, d}\right]}{\left(\frac{d\, (a+b\, x)}{-b\, c+a\, d}\right)^{1/3}}\right)}{2\, d}$$

Problem 1589: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a+b\, x)^{2/3}\, (c+d\, x)^{1/3}}\, dx$$

Optimal (type 3, 126 leaves, 1 step):

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

Result (type 5, 73 leaves):

$$\frac{3 \left(\frac{d\, (a+b\, x)}{-b\, c+a\, d}\right)^{2/3} (c+d\, x)^{2/3}\, \text{Hypergeometric2F1}\left[\frac{2}{3}, \frac{2}{3}, \frac{5}{3}, \frac{b\, (c+d\, x)}{b\, c-a\, d}\right]}{2\, d\, (a+b\, x)^{2/3}}$$

Problem 1594: Result unnecessarily involves higher level functions.

$$\int \frac{(a+b\, x)^{8/3}}{(c+d\, x)^{1/3}}\, dx$$

Optimal (type 4, 1365 leaves, 8 steps):

$$\frac{3\,(b\,c-a\,d)^2\,(a+b\,x)^{2/3}\,(c+d\,x)^{2/3}}{7\,d^3}-\frac{12\,(b\,c-a\,d)\,(a+b\,x)^{5/3}\,(c+d\,x)^{2/3}}{35\,d^2}+\frac{3\,(a+b\,x)^{8/3}\,(c+d\,x)^{2/3}}{10\,d}-$$

$$\left(3\times 2^{2/3}\,(b\,c-a\,d)^3\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\,\sqrt{\left(a\,d+b\,(c+2\,d\,x)\right)^2}\right)\Big/\left(7\,b^{2/3}\,d^{11/3}\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}\,(b\,c+a\,d+2\,b\,d\,x)\left(\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)\right)+$$

$$\left(3\times 3^{1/4}\sqrt{2-\sqrt{3}}\,(b\,c-a\,d)^{11/3}\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)\sqrt{\left(\left((b\,c-a\,d)^{4/3}-2^{2/3}\,b^{1/3}\,d^{1/3}\,(b\,c-a\,d)^{2/3}\left((a+b\,x)\,(c+d\,x)\right)^{1/3}+2\times 2^{1/3}\,b^{2/3}\,d^{2/3}\left((a+b\,x)\,(c+d\,x)\right)^{2/3}\right)\Big/\left(\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)^2\right)}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\left((a+b\,x)\,(c+d\,x)\right)^{1/3}}{\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\left((a+b\,x)\,(c+d\,x)\right)^{1/3}}\right],-7-4\sqrt{3}\right]\right)\Big/$$

$$\left(7\times 2^{1/3}\,b^{2/3}\,d^{11/3}\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}\,(b\,c+a\,d+2\,b\,d\,x)\sqrt{\left((b\,c-a\,d)^{2/3}\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)\right)\Big/\left(\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)^2}\,\sqrt{\left(a\,d+b\,(c+2\,d\,x)\right)^2}\right)-$$

$$\left(2\times 2^{1/6}\times 3^{3/4}\,(b\,c-a\,d)^{11/3}\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)\sqrt{\left(\left((b\,c-a\,d)^{4/3}-2^{2/3}\,b^{1/3}\,d^{1/3}\,(b\,c-a\,d)^{2/3}\left((a+b\,x)\,(c+d\,x)\right)^{1/3}+2\times 2^{1/3}\,b^{2/3}\,d^{2/3}\left((a+b\,x)\,(c+d\,x)\right)^{2/3}\right)\Big/\left(\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)^2\right)}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\left((a+b\,x)\,(c+d\,x)\right)^{1/3}}{\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\left((a+b\,x)\,(c+d\,x)\right)^{1/3}}\right],-7-4\sqrt{3}\right]\right)\Big/$$

$$\left(7\,b^{2/3}\,d^{11/3}\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}\,(b\,c+a\,d+2\,b\,d\,x)\sqrt{\left((b\,c-a\,d)^{2/3}\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)\right)\Big/\left(\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)^2}\,\sqrt{\left(a\,d+b\,(c+2\,d\,x)\right)^2}\right)$$

Result (type 5, 138 leaves) :

$$\frac{1}{70\, d^4\, (a+b\, x)^{1/3}} 3\, (c+d\, x)^{2/3} \left(d\, (a+b\, x)\, \left(25\, a^2\, d^2+2\, a\, b\, d\, (-14\, c+11\, d\, x)+b^2\, \left(10\, c^2-8\, c\, d\, x+7\, d^2\, x^2\right)\right) - 10\, (b\, c-a\, d)^3 \left(\frac{d\, (a+b\, x)}{-b\, c+a\, d}\right)^{1/3} \text{Hypergeometric2F1}\left[\frac{1}{3},\, \frac{2}{3},\, \frac{5}{3},\, \frac{b\, (c+d\, x)}{b\, c-a\, d}\right]\right)$$

Problem 1595: Result unnecessarily involves higher level functions.

$$\int \frac{(a+b\, x)^{5/3}}{(c+d\, x)^{1/3}}\, dx$$

Optimal (type 4, 1330 leaves, 7 steps):

$$-\frac{15\,(b\,c-a\,d)\,(a+b\,x)^{2/3}\,(c+d\,x)^{2/3}}{28\,d^2}+\frac{3\,(a+b\,x)^{5/3}\,(c+d\,x)^{2/3}}{7\,d}+$$
$$\left(15\,(b\,c-a\,d)^2\,((a+b\,x)\,(c+d\,x))^{1/3}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)\Big/$$
$$\left(14\times 2^{1/3}\,b^{2/3}\,d^{8/3}\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}\,(b\,c+a\,d+2\,b\,d\,x)\right.$$
$$\left.\left(\left(1+\sqrt{3}\right)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}\right)\right)-$$
$$\left(15\times 3^{1/4}\,\sqrt{2-\sqrt{3}}\,(b\,c-a\,d)^{8/3}\,((a+b\,x)\,(c+d\,x))^{1/3}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\right.$$
$$\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}\right)\,\sqrt{\left(\left((b\,c-a\,d)^{4/3}-2^{2/3}\,b^{1/3}\,d^{1/3}\right.\right.}$$
$$\left.(b\,c-a\,d)^{2/3}\,((a+b\,x)\,(c+d\,x))^{1/3}+2\times 2^{1/3}\,b^{2/3}\,d^{2/3}\,((a+b\,x)\,(c+d\,x))^{2/3}\right)\Big/$$
$$\left.\left(\left(1+\sqrt{3}\right)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}\right)^2\right)\,\text{EllipticE}\Big[$$
$$\left.\text{ArcSin}\Big[\frac{\left(1-\sqrt{3}\right)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}}{\left(1+\sqrt{3}\right)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}}\Big],\,-7-4\,\sqrt{3}\Big]\right)\Big/$$
$$\left(28\times 2^{1/3}\,b^{2/3}\,d^{8/3}\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}\,(b\,c+a\,d+2\,b\,d\,x)\right.$$
$$\sqrt{\left(\left((b\,c-a\,d)^{2/3}\,\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}\right)\right)\Big/\right.}$$
$$\left.\left.\left(\left(1+\sqrt{3}\right)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}\right)^2\right)\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)+$$
$$\left(5\times 3^{3/4}\,(b\,c-a\,d)^{8/3}\,((a+b\,x)\,(c+d\,x))^{1/3}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\right.$$
$$\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}\right)$$
$$\sqrt{\left(\left((b\,c-a\,d)^{4/3}-2^{2/3}\,b^{1/3}\,d^{1/3}\,(b\,c-a\,d)^{2/3}\,((a+b\,x)\,(c+d\,x))^{1/3}+\right.\right.}$$
$$\left.2\times 2^{1/3}\,b^{2/3}\,d^{2/3}\,((a+b\,x)\,(c+d\,x))^{2/3}\right)\Big/$$
$$\left.\left(\left(1+\sqrt{3}\right)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}\right)^2\right)\,\text{EllipticF}\Big[$$
$$\left.\text{ArcSin}\Big[\frac{\left(1-\sqrt{3}\right)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}}{\left(1+\sqrt{3}\right)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}}\Big],\,-7-4\,\sqrt{3}\Big]\right)\Big/$$
$$\left(7\times 2^{5/6}\,b^{2/3}\,d^{8/3}\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}\,(b\,c+a\,d+2\,b\,d\,x)\right.$$
$$\sqrt{\left(\left((b\,c-a\,d)^{2/3}\,\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}\right)\right)\Big/\right.}$$
$$\left.\left.\left(\left(1+\sqrt{3}\right)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}\right)^2\right)\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)$$

Result (type 5, 107 leaves):

$$\frac{1}{28\,d^3\,(a+b\,x)^{1/3}}3\,(c+d\,x)^{2/3}\,\Big(d\,(a+b\,x)\,(-5\,b\,c+9\,a\,d+4\,b\,d\,x)+$$
$$5\,(b\,c-a\,d)^2\,\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{1/3}\,\text{Hypergeometric2F1}\Big[\frac{1}{3},\,\frac{2}{3},\,\frac{5}{3},\,\frac{b\,(c+d\,x)}{b\,c-a\,d}\Big]\Big)$$

Problem 1596: Result unnecessarily involves higher level functions.

$$\int \frac{(a+b x)^{2/3}}{(c+d x)^{1/3}} \, dx$$

Optimal (type 4, 1293 leaves, 6 steps):

$$\frac{3 (a+b x)^{2/3} (c+d x)^{2/3}}{4 d} - \left(3 (b c-a d) ((a+b x) (c+d x))^{1/3} \sqrt{(b c+a d+2 b d x)^2} \sqrt{\left(a d+b (c+2 d x)\right)^2}\right) \Big/ \left(2 \times 2^{1/3} b^{2/3} d^{5/3} (a+b x)^{1/3} (c+d x)^{1/3} (b c+a d+2 b d x) \left(\left(1+\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} ((a+b x) (c+d x))^{1/3}\right)\right) + \left(3 \times 3^{1/4} \sqrt{2-\sqrt{3}} (b c-a d)^{5/3} ((a+b x) (c+d x))^{1/3} \sqrt{(b c+a d+2 b d x)^2} \left((b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} ((a+b x) (c+d x))^{1/3}\right) \sqrt{\left(\left((b c-a d)^{4/3}-2^{2/3} b^{1/3} d^{1/3} (b c-a d)^{2/3} ((a+b x) (c+d x))^{1/3}+2 \times 2^{1/3} b^{2/3} d^{2/3} ((a+b x) (c+d x))^{2/3}\right) \Big/ \left(\left(1+\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} ((a+b x) (c+d x))^{1/3}\right)^2\right)} \text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} ((a+b x) (c+d x))^{1/3}}{\left(1+\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} ((a+b x) (c+d x))^{1/3}}\right], -7-4 \sqrt{3}\right]\right) \Big/ \left(4 \times 2^{1/3} b^{2/3} d^{5/3} (a+b x)^{1/3} (c+d x)^{1/3} (b c+a d+2 b d x) \sqrt{\left((b c-a d)^{2/3} \left((b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} ((a+b x) (c+d x))^{1/3}\right)\right) \Big/ \left(\left(1+\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} ((a+b x) (c+d x))^{1/3}\right)^2} \sqrt{\left(a d+b (c+2 d x)\right)^2}\right) - \left(3^{3/4} (b c-a d)^{5/3} ((a+b x) (c+d x))^{1/3} \sqrt{(b c+a d+2 b d x)^2} \left((b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} ((a+b x) (c+d x))^{1/3}\right) \sqrt{\left(\left((b c-a d)^{4/3}-2^{2/3} b^{1/3} d^{1/3} (b c-a d)^{2/3} ((a+b x) (c+d x))^{1/3}+2 \times 2^{1/3} b^{2/3} d^{2/3} ((a+b x) (c+d x))^{2/3}\right) \Big/ \left(\left(1+\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} ((a+b x) (c+d x))^{1/3}\right)^2\right)} \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} ((a+b x) (c+d x))^{1/3}}{\left(1+\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} ((a+b x) (c+d x))^{1/3}}\right], -7-4 \sqrt{3}\right]\right) \Big/ \left(2^{5/6} b^{2/3} d^{5/3} (a+b x)^{1/3} (c+d x)^{1/3} (b c+a d+2 b d x) \sqrt{\left((b c-a d)^{2/3} \left((b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} ((a+b x) (c+d x))^{1/3}\right)\right) \Big/ \left(\left(1+\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} ((a+b x) (c+d x))^{1/3}\right)^2} \sqrt{\left(a d+b (c+2 d x)\right)^2}\right)$$

Result (type 5, 76 leaves) :

$$\frac{3\,(a+b\,x)^{2/3}\,(c+d\,x)^{2/3}\left(1+\frac{\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{5}{3},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]}{\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{2/3}}\right)}{4\,d}$$

Problem 1597: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}}\,dx$$

Optimal (type 4, 1257 leaves, 5 steps) :

$$\Big(3\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\,\sqrt{\big(a\,d+b\,(c+2\,d\,x)\big)^2}\Big)\Big/$$
$$\Big(2^{1/3}\,b^{2/3}\,d^{2/3}\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}\,(b\,c+a\,d+2\,b\,d\,x)$$
$$\Big(\big(1+\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)\Big)-$$
$$\Big(3\times 3^{1/4}\sqrt{2-\sqrt{3}}\,(b\,c-a\,d)^{2/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}$$
$$\Big((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)\sqrt{\Big(\Big((b\,c-a\,d)^{4/3}-2^{2/3}\,b^{1/3}\,d^{1/3}}$$
$$(b\,c-a\,d)^{2/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}+2\times 2^{1/3}\,b^{2/3}\,d^{2/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{2/3}\Big)\Big/$$
$$\Big(\big(1+\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)^2\Big)\;\text{EllipticE}\Big[$$
$$\text{ArcSin}\Big[\frac{\big(1-\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}}{\big(1+\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}}\Big],\,-7-4\sqrt{3}\Big]\Big)\Big/$$
$$\Big(2\times 2^{1/3}\,b^{2/3}\,d^{2/3}\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}\,(b\,c+a\,d+2\,b\,d\,x)$$
$$\sqrt{\Big(\Big((b\,c-a\,d)^{2/3}\,\Big((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)\Big)\Big/}$$
$$\Big(\big(1+\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)^2\Big)\sqrt{\big(a\,d+b\,(c+2\,d\,x)\big)^2}\Big)+$$
$$\Big(2^{1/6}\times 3^{3/4}\,(b\,c-a\,d)^{2/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}$$
$$\Big((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)$$
$$\sqrt{\Big(\Big((b\,c-a\,d)^{4/3}-2^{2/3}\,b^{1/3}\,d^{1/3}\,(b\,c-a\,d)^{2/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}+}$$
$$2\times 2^{1/3}\,b^{2/3}\,d^{2/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{2/3}\Big)\Big/$$
$$\Big(\big(1+\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)^2\Big)\;\text{EllipticF}\Big[$$
$$\text{ArcSin}\Big[\frac{\big(1-\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}}{\big(1+\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}}\Big],\,-7-4\sqrt{3}\Big]\Big)\Big/$$
$$\Big(b^{2/3}\,d^{2/3}\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}\,(b\,c+a\,d+2\,b\,d\,x)$$
$$\sqrt{\Big(\Big((b\,c-a\,d)^{2/3}\,\Big((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)\Big)\Big/}$$
$$\Big(\big(1+\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)^2\Big)\sqrt{\big(a\,d+b\,(c+2\,d\,x)\big)^2}\Big)$$

Result (type 5, 73 leaves):

$$\frac{3\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{1/3}(c+d\,x)^{2/3}\,\text{Hypergeometric2F1}\Big[\frac{1}{3},\frac{2}{3},\frac{5}{3},\frac{b\,(c+d\,x)}{b\,c-a\,d}\Big]}{2\,d\,(a+b\,x)^{1/3}}$$

Problem 1598: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a+b x)^{4/3}\,(c+d x)^{1/3}}\,dx$$

Optimal (type 4, 1297 leaves, 6 steps):

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

$$\left(3\,d^{1/3}\,\left((a+b x)\,(c+d x)\right)^{1/3}\,\sqrt{(b c+a d+2 b d x)^2}\,\sqrt{\left(a d+b\,(c+2 d x)\right)^2}\right)\Big/$$
$$\left(2^{1/3}\,b^{2/3}\,(b c-a d)\,(a+b x)^{1/3}\,(c+d x)^{1/3}\,(b c+a d+2 b d x)\right.$$
$$\left.\left(\left(1+\sqrt{3}\right)\,(b c-a d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b x)\,(c+d x)\right)^{1/3}\right)\right)-$$

$$\left(3\times 3^{1/4}\,\sqrt{2-\sqrt{3}}\,d^{1/3}\,\left((a+b x)\,(c+d x)\right)^{1/3}\,\sqrt{(b c+a d+2 b d x)^2}\right.$$
$$\left((b c-a d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b x)\,(c+d x)\right)^{1/3}\right)\,\sqrt{\left(\left((b c-a d)^{4/3}-2^{2/3}\,b^{1/3}\,d^{1/3}\right.\right.}$$
$$\left.(b c-a d)^{2/3}\,\left((a+b x)\,(c+d x)\right)^{1/3}+2\times 2^{1/3}\,b^{2/3}\,d^{2/3}\,\left((a+b x)\,(c+d x)\right)^{2/3}\right)\Big/$$
$$\left.\left(\left(1+\sqrt{3}\right)\,(b c-a d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b x)\,(c+d x)\right)^{1/3}\right)^2\right)\,\text{EllipticE}\Big[$$
$$\left.\text{ArcSin}\Big[\frac{\left(1-\sqrt{3}\right)\,(b c-a d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b x)\,(c+d x)\right)^{1/3}}{\left(1+\sqrt{3}\right)\,(b c-a d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b x)\,(c+d x)\right)^{1/3}}\Big],\,-7-4\sqrt{3}\Big]\right)\Big/$$
$$\left(2\times 2^{1/3}\,b^{2/3}\,(b c-a d)^{1/3}\,(a+b x)^{1/3}\,(c+d x)^{1/3}\,(b c+a d+2 b d x)\right.$$
$$\sqrt{\left(\left((b c-a d)^{2/3}\,\left((b c-a d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b x)\,(c+d x)\right)^{1/3}\right)\right)\Big/\right.}$$
$$\left.\left.\left(\left(1+\sqrt{3}\right)\,(b c-a d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b x)\,(c+d x)\right)^{1/3}\right)^2\right)\,\sqrt{\left(a d+b\,(c+2 d x)\right)^2}\right)+$$

$$\left(2^{1/6}\times 3^{3/4}\,d^{1/3}\,\left((a+b x)\,(c+d x)\right)^{1/3}\,\sqrt{(b c+a d+2 b d x)^2}\right.$$
$$\left((b c-a d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b x)\,(c+d x)\right)^{1/3}\right)$$
$$\sqrt{\left(\left((b c-a d)^{4/3}-2^{2/3}\,b^{1/3}\,d^{1/3}\,(b c-a d)^{2/3}\,\left((a+b x)\,(c+d x)\right)^{1/3}+\right.\right.}$$
$$\left.2\times 2^{1/3}\,b^{2/3}\,d^{2/3}\,\left((a+b x)\,(c+d x)\right)^{2/3}\right)\Big/$$
$$\left.\left(\left(1+\sqrt{3}\right)\,(b c-a d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b x)\,(c+d x)\right)^{1/3}\right)^2\right)\,\text{EllipticF}\Big[$$
$$\left.\text{ArcSin}\Big[\frac{\left(1-\sqrt{3}\right)\,(b c-a d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b x)\,(c+d x)\right)^{1/3}}{\left(1+\sqrt{3}\right)\,(b c-a d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b x)\,(c+d x)\right)^{1/3}}\Big],\,-7-4\sqrt{3}\Big]\right)\Big/$$
$$\left(b^{2/3}\,(b c-a d)^{1/3}\,(a+b x)^{1/3}\,(c+d x)^{1/3}\,(b c+a d+2 b d x)\right.$$
$$\sqrt{\left(\left((b c-a d)^{2/3}\,\left((b c-a d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b x)\,(c+d x)\right)^{1/3}\right)\right)\Big/\right.}$$
$$\left.\left.\left(\left(1+\sqrt{3}\right)\,(b c-a d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b x)\,(c+d x)\right)^{1/3}\right)^2\right)\,\sqrt{\left(a d+b\,(c+2 d x)\right)^2}\right)$$

Result (type 5, 83 leaves) :

$$\left(3\,(c+d\,x)^{2/3}\left(-2+\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{1/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{5}{3},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\right)\Big/\left(2\,(b\,c-a\,d)\,(a+b\,x)^{1/3}\right)$$

Problem 1599: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(a+b\,x)^{7/3}\,(c+d\,x)^{1/3}}\,dx$$

Optimal (type 4, 1335 leaves, 7 steps) :

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

$$\left(3\,d^{4/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\,\sqrt{\left(a\,d+b\,(c+2\,d\,x)\right)^2}\right)\Big/$$
$$\left(2\times 2^{1/3}\,b^{2/3}\,(b\,c-a\,d)^2\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}\,(b\,c+a\,d+2\,b\,d\,x)\right.$$
$$\left.\left(\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)\right)+$$

$$\left(3\times 3^{1/4}\,\sqrt{2-\sqrt{3}}\,d^{4/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\right.$$
$$\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)\sqrt{\left(\left((b\,c-a\,d)^{4/3}-2^{2/3}\,b^{1/3}\,d^{1/3}\right.\right.}$$
$$\left.(b\,c-a\,d)^{2/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}+2\times 2^{1/3}\,b^{2/3}\,d^{2/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{2/3}\right)\Big/$$
$$\left.\left(\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)^2\right)\,\text{EllipticE}\Big[$$
$$\left.\text{ArcSin}\Big[\frac{\left(1-\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}}{\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}}\Big],\,-7-4\,\sqrt{3}\Big]\right)\Big/$$
$$\left(4\times 2^{1/3}\,b^{2/3}\,(b\,c-a\,d)^{4/3}\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}\,(b\,c+a\,d+2\,b\,d\,x)\right.$$
$$\sqrt{\left(\left((b\,c-a\,d)^{2/3}\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)\right)\Big/\right.}$$
$$\left.\left.\left(\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)^2\right)\sqrt{\left(a\,d+b\,(c+2\,d\,x)\right)^2}\right)-$$

$$\left(3^{3/4}\,d^{4/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\right.$$
$$\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)$$
$$\sqrt{\left(\left((b\,c-a\,d)^{4/3}-2^{2/3}\,b^{1/3}\,d^{1/3}\,(b\,c-a\,d)^{2/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}+\right.\right.}$$
$$\left.2\times 2^{1/3}\,b^{2/3}\,d^{2/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{2/3}\right)\Big/$$
$$\left.\left(\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)^2\right)\,\text{EllipticF}\Big[$$
$$\left.\text{ArcSin}\Big[\frac{\left(1-\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}}{\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}}\Big],\,-7-4\,\sqrt{3}\Big]\right)\Big/$$
$$\left(2^{5/6}\,b^{2/3}\,(b\,c-a\,d)^{4/3}\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}\,(b\,c+a\,d+2\,b\,d\,x)\right.$$
$$\sqrt{\left(\left((b\,c-a\,d)^{2/3}\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)\right)\Big/\right.}$$
$$\left.\left.\left(\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)^2\right)\sqrt{\left(a\,d+b\,(c+2\,d\,x)\right)^2}\right)$$

Result (type 5, 100 leaves):

$$-\left(\left(3\,(c+d\,x)^{2/3}\left(-3\,a\,d+b\,(c-2\,d\,x)+d\,(a+b\,x)\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{1/3}\right.\right.\right.$$
$$\left.\left.\left.\text{Hypergeometric2F1}\Big[\frac{1}{3},\,\frac{2}{3},\,\frac{5}{3},\,\frac{b\,(c+d\,x)}{b\,c-a\,d}\Big]\right)\right)\Big/\left(4\,(b\,c-a\,d)^2\,(a+b\,x)^{4/3}\right)\right)$$

Problem 1600: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a+b x)^{10/3} (c+d x)^{1/3}} \, dx$$

Optimal (type 4, 1372 leaves, 8 steps):

$$-\frac{3 (c+d x)^{2/3}}{7 (b c-a d) (a+b x)^{7/3}}+\frac{15 d (c+d x)^{2/3}}{28 (b c-a d)^2 (a+b x)^{4/3}}-\frac{15 d^2 (c+d x)^{2/3}}{14 (b c-a d)^3 (a+b x)^{1/3}}+$$

$$\left(15 d^{7/3} ((a+b x) (c+d x))^{1/3} \sqrt{(b c+a d+2 b d x)^2} \sqrt{(a d+b (c+2 d x))^2}\right) \Big/ \left(14\times 2^{1/3} b^{2/3} (b c-a d)^3 (a+b x)^{1/3} (c+d x)^{1/3} (b c+a d+2 b d x) \left(\left(1+\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} ((a+b x) (c+d x))^{1/3}\right)\right)-$$

$$\Bigg(15\times 3^{1/4} \sqrt{2-\sqrt{3}}\, d^{7/3} ((a+b x) (c+d x))^{1/3} \sqrt{(b c+a d+2 b d x)^2} \left((b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} ((a+b x) (c+d x))^{1/3}\right) \sqrt{\left(\left((b c-a d)^{4/3}-2^{2/3} b^{1/3} d^{1/3} (b c-a d)^{2/3} ((a+b x) (c+d x))^{1/3}+2\times 2^{1/3} b^{2/3} d^{2/3} ((a+b x) (c+d x))^{2/3}\right) \Big/ \left(\left(1+\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} ((a+b x) (c+d x))^{1/3}\right)^2\right)} \,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} ((a+b x) (c+d x))^{1/3}}{\left(1+\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} ((a+b x) (c+d x))^{1/3}}\right],-7-4 \sqrt{3}\right]\Bigg) \Big/$$

$$\left(28\times 2^{1/3} b^{2/3} (b c-a d)^{7/3} (a+b x)^{1/3} (c+d x)^{1/3} (b c+a d+2 b d x) \sqrt{\left((b c-a d)^{2/3} \left((b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} ((a+b x) (c+d x))^{1/3}\right)\right) \Big/ \left(\left(1+\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} ((a+b x) (c+d x))^{1/3}\right)^2} \sqrt{(a d+b (c+2 d x))^2}\right)+$$

$$\Bigg(5\times 3^{3/4} d^{7/3} ((a+b x) (c+d x))^{1/3} \sqrt{(b c+a d+2 b d x)^2} \left((b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} ((a+b x) (c+d x))^{1/3}\right) \sqrt{\left(\left((b c-a d)^{4/3}-2^{2/3} b^{1/3} d^{1/3} (b c-a d)^{2/3} ((a+b x) (c+d x))^{1/3}+2\times 2^{1/3} b^{2/3} d^{2/3} ((a+b x) (c+d x))^{2/3}\right) \Big/ \left(\left(1+\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} ((a+b x) (c+d x))^{1/3}\right)^2\right)} \,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} ((a+b x) (c+d x))^{1/3}}{\left(1+\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} ((a+b x) (c+d x))^{1/3}}\right],-7-4 \sqrt{3}\right]\Bigg) \Big/$$

$$\left(7\times 2^{5/6} b^{2/3} (b c-a d)^{7/3} (a+b x)^{1/3} (c+d x)^{1/3} (b c+a d+2 b d x) \sqrt{\left((b c-a d)^{2/3} \left((b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} ((a+b x) (c+d x))^{1/3}\right)\right) \Big/ \left(\left(1+\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} ((a+b x) (c+d x))^{1/3}\right)^2} \sqrt{(a d+b (c+2 d x))^2}\right)$$

Result (type 5, 136 leaves):

$$\left(3 (c+d x)^{2/3} \left(-19 a^2 d^2+a b d (13 c-25 d x)+b^2 \left(-4 c^2+5 c d x-10 d^2 x^2\right)+5 d^2 (a+b x)^2 \left(\frac{d (a+b x)}{-b c+a d}\right)^{1/3} \text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{5}{3},\frac{b (c+d x)}{b c-a d}\right]\right)\right)\Big/\left(28 (b c-a d)^3 (a+b x)^{7/3}\right)$$

Problem 1601: Result unnecessarily involves higher level functions.

$$\int \frac{(a+b x)^{5/3}}{(c+d x)^{2/3}} \, dx$$

Optimal (type 3, 216 leaves, 3 steps):

$$-\frac{5 (b c-a d) (a+b x)^{2/3} (c+d x)^{1/3}}{6 d^2}+\frac{(a+b x)^{5/3} (c+d x)^{1/3}}{2 d}-\frac{5 (b c-a d)^2 \text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2 d^{1/3} (a+b x)^{1/3}}{\sqrt{3} b^{1/3} (c+d x)^{1/3}}\right]}{3 \sqrt{3} b^{1/3} d^{8/3}}-\frac{5 (b c-a d)^2 \text{Log}[c+d x]}{18 b^{1/3} d^{8/3}}-\frac{5 (b c-a d)^2 \text{Log}\left[-1+\frac{d^{1/3} (a+b x)^{1/3}}{b^{1/3} (c+d x)^{1/3}}\right]}{6 b^{1/3} d^{8/3}}$$

Result (type 5, 107 leaves):

$$\frac{1}{6 d^3 (a+b x)^{1/3}} (c+d x)^{1/3} \left(d (a+b x) (-5 b c+8 a d+3 b d x)+10 (b c-a d)^2 \left(\frac{d (a+b x)}{-b c+a d}\right)^{1/3} \text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},\frac{b (c+d x)}{b c-a d}\right]\right)$$

Problem 1602: Result unnecessarily involves higher level functions.

$$\int \frac{(a+b x)^{2/3}}{(c+d x)^{2/3}} \, dx$$

Optimal (type 3, 169 leaves, 2 steps):

$$\frac{(a+b x)^{2/3} (c+d x)^{1/3}}{d}+\frac{2 (b c-a d) \text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2 d^{1/3} (a+b x)^{1/3}}{\sqrt{3} b^{1/3} (c+d x)^{1/3}}\right]}{\sqrt{3} b^{1/3} d^{5/3}}+\frac{(b c-a d) \text{Log}[c+d x]}{3 b^{1/3} d^{5/3}}+\frac{(b c-a d) \text{Log}\left[-1+\frac{d^{1/3} (a+b x)^{1/3}}{b^{1/3} (c+d x)^{1/3}}\right]}{b^{1/3} d^{5/3}}$$

Result (type 5, 74 leaves):

$$\frac{(a+b\,x)^{2/3}\,(c+d\,x)^{1/3}\left(1+\frac{2\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]}{\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{2/3}}\right)}{d}$$

Problem 1603: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(a+b\,x)^{1/3}\,(c+d\,x)^{2/3}}\,dx$$

Optimal (type 3, 126 leaves, 1 step):

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

Result (type 5, 71 leaves):

$$\frac{3\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{1/3}(c+d\,x)^{1/3}\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]}{d\,(a+b\,x)^{1/3}}$$

Problem 1608: Result unnecessarily involves higher level functions.

$$\int\frac{(a+b\,x)^{7/3}}{(c+d\,x)^{2/3}}\,dx$$

Optimal (type 4, 649 leaves, 6 steps):

$$\frac{21\,(b\,c-a\,d)^2\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}}{20\,d^3}-\frac{21\,(b\,c-a\,d)\,(a+b\,x)^{4/3}\,(c+d\,x)^{1/3}}{40\,d^2}+\frac{3\,(a+b\,x)^{7/3}\,(c+d\,x)^{1/3}}{8\,d}-$$

$$\left(7\times 3^{3/4}\sqrt{2+\sqrt{3}}\,(b\,c-a\,d)^3\,((a+b\,x)\,(c+d\,x))^{2/3}\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\right.$$
$$\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}\right)\sqrt{\left(\left((b\,c-a\,d)^{4/3}-2^{2/3}\,b^{1/3}\,d^{1/3}\right.\right.}$$
$$\left.(b\,c-a\,d)^{2/3}\,((a+b\,x)\,(c+d\,x))^{1/3}+2\times 2^{1/3}\,b^{2/3}\,d^{2/3}\,((a+b\,x)\,(c+d\,x))^{2/3}\right)\Big/$$
$$\left.\left(\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}\right)^2\right)\,\text{EllipticF}\Big[$$
$$\left.\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}}{\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}}\right],\,-7-4\sqrt{3}\Big]\right)\Big/$$
$$\left(10\times 2^{2/3}\,b^{1/3}\,d^{10/3}\,(a+b\,x)^{2/3}\,(c+d\,x)^{2/3}\,(b\,c+a\,d+2\,b\,d\,x)\right.$$
$$\sqrt{\left(\left((b\,c-a\,d)^{2/3}\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}\right)\right)\Big/\right.}$$
$$\left.\left.\left(\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}\right)^2\right)\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)$$

Result (type 5, 137 leaves):

$$\frac{1}{40\,d^4\,(a+b\,x)^{2/3}}3\,(c+d\,x)^{1/3}\left(d\,(a+b\,x)\,\left(26\,a^2\,d^2+a\,b\,d\,(-35\,c+17\,d\,x)+b^2\,(14\,c^2-7\,c\,d\,x+5\,d^2\,x^2)\right)-14\,(b\,c-a\,d)^3\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{2/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{4}{3},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)$$

Problem 1609: Result unnecessarily involves higher level functions.

$$\int\frac{(a+b\,x)^{4/3}}{(c+d\,x)^{2/3}}\,dx$$

Optimal (type 4, 614 leaves, 5 steps):

$$-\frac{6\,(b\,c-a\,d)\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}}{5\,d^2}+\frac{3\,(a+b\,x)^{4/3}\,(c+d\,x)^{1/3}}{5\,d}+\left(2\times 2^{1/3}\times 3^{3/4}\sqrt{2+\sqrt{3}}\,(b\,c-a\,d)^2\,\left((a+b\,x)\,(c+d\,x)\right)^{2/3}\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\,\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)\sqrt{\left(\left((b\,c-a\,d)^{4/3}-2^{2/3}\,b^{1/3}\,d^{1/3}\,(b\,c-a\,d)^{2/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}+2\times 2^{1/3}\,b^{2/3}\,d^{2/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{2/3}\right)\Big/\left(\left(1+\sqrt{3}\right)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)^2\right)}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}}{\left(1+\sqrt{3}\right)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}}\right],-7-4\sqrt{3}\right]\right)\Big/\left(5\,b^{1/3}\,d^{7/3}\,(a+b\,x)^{2/3}\,(c+d\,x)^{2/3}\,(b\,c+a\,d+2\,b\,d\,x)\sqrt{\left((b\,c-a\,d)^{2/3}\,\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)\right)\Big/\left(\left(1+\sqrt{3}\right)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)^2}\,\sqrt{\left(a\,d+b\,(c+2\,d\,x)\right)^2}\right)$$

Result (type 5, 106 leaves):

$$\frac{1}{5\,d^3\,(a+b\,x)^{2/3}}3\,(c+d\,x)^{1/3}\left(d\,(a+b\,x)\,(-2\,b\,c+3\,a\,d+b\,d\,x)+2\,(b\,c-a\,d)^2\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{2/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{4}{3},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)$$

Problem 1610: Result unnecessarily involves higher level functions.

$$\int \frac{(a+b x)^{1/3}}{(c+d x)^{2/3}} \, dx$$

Optimal (type 4, 577 leaves, 4 steps):

$$\frac{3 (a+b x)^{1/3} (c+d x)^{1/3}}{2 d} - \left(3^{3/4} \sqrt{2+\sqrt{3}} \, (b c-a d) \left((a+b x) (c+d x)\right)^{2/3} \sqrt{(b c+a d+2 b d x)^2} \left((b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} \left((a+b x) (c+d x)\right)^{1/3}\right) \sqrt{\left(\left((b c-a d)^{4/3}-2^{2/3} b^{1/3} d^{1/3} (b c-a d)^{2/3} \left((a+b x) (c+d x)\right)^{1/3}+2\times 2^{1/3} b^{2/3} d^{2/3} \left((a+b x) (c+d x)\right)^{2/3}\right) \Big/ \left(\left(1+\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} \left((a+b x) (c+d x)\right)^{1/3}\right)^2\right)} \, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} \left((a+b x) (c+d x)\right)^{1/3}}{\left(1+\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} \left((a+b x) (c+d x)\right)^{1/3}}\right], -7-4 \sqrt{3}\right]\right) \Big/ \left(2^{2/3} b^{1/3} d^{4/3} (a+b x)^{2/3} (c+d x)^{2/3} (b c+a d+2 b d x) \sqrt{\left((b c-a d)^{2/3} \left((b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} \left((a+b x) (c+d x)\right)^{1/3}\right)\right) \Big/ \left(\left(1+\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} \left((a+b x) (c+d x)\right)^{1/3}\right)^2} \sqrt{\left(a d+b (c+2 d x)\right)^2}\right)$$

Result (type 5, 76 leaves):

$$\frac{3 (a+b x)^{1/3} (c+d x)^{1/3} \left(1+\frac{\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{4}{3},\frac{b (c+d x)}{b c-a d}\right]}{\left(\frac{d (a+b x)}{-b c+a d}\right)^{1/3}}\right)}{2 d}$$

Problem 1611: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a+b x)^{2/3} (c+d x)^{2/3}} \, dx$$

Optimal (type 4, 542 leaves, 3 steps):

$$\left(2^{1/3}\times 3^{3/4}\sqrt{2+\sqrt{3}}\left((a+b x)(c+d x)\right)^{2/3}\sqrt{(b c+a d+2 b d x)^2}\left((b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3}\left((a+b x)(c+d x)\right)^{1/3}\right)\sqrt{\left(\left((b c-a d)^{4/3}-2^{2/3} b^{1/3} d^{1/3}(b c-a d)^{2/3}\left((a+b x)(c+d x)\right)^{1/3}+2\times 2^{1/3} b^{2/3} d^{2/3}\left((a+b x)(c+d x)\right)^{2/3}\right)\middle/\left(\left(1+\sqrt{3}\right)(b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3}\left((a+b x)(c+d x)\right)^{1/3}\right)^2\right)}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)(b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3}\left((a+b x)(c+d x)\right)^{1/3}}{\left(1+\sqrt{3}\right)(b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3}\left((a+b x)(c+d x)\right)^{1/3}}\right],-7-4\sqrt{3}\right]\right)\Bigg/\left(b^{1/3} d^{1/3}(a+b x)^{2/3}(c+d x)^{2/3}(b c+a d+2 b d x)\sqrt{\left((b c-a d)^{2/3}\left((b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3}\left((a+b x)(c+d x)\right)^{1/3}\right)\right)\middle/\left(\left(1+\sqrt{3}\right)(b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3}\left((a+b x)(c+d x)\right)^{1/3}\right)^2}\sqrt{\left(a d+b(c+2 d x)\right)^2}\right)$$

Result (type 5, 71 leaves):

$$\frac{3\left(\frac{d(a+b x)}{-b c+a d}\right)^{2/3}(c+d x)^{1/3}\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{4}{3},\frac{b(c+d x)}{b c-a d}\right]}{d(a+b x)^{2/3}}$$

Problem 1612: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(a+b x)^{5/3}(c+d x)^{2/3}}\,dx$$

Optimal (type 4, 586 leaves, 4 steps):

$$-\frac{3(c+d x)^{1/3}}{2(b c-a d)(a+b x)^{2/3}}-\left(3^{3/4}\sqrt{2+\sqrt{3}}\,d^{2/3}\left((a+b x)(c+d x)\right)^{2/3}\sqrt{(b c+a d+2 b d x)^2}\left((b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3}\left((a+b x)(c+d x)\right)^{1/3}\right)\sqrt{\left(\left((b c-a d)^{4/3}-2^{2/3} b^{1/3} d^{1/3}(b c-a d)^{2/3}\left((a+b x)(c+d x)\right)^{1/3}+2\times 2^{1/3} b^{2/3} d^{2/3}\left((a+b x)(c+d x)\right)^{2/3}\right)\middle/\left(\left(1+\sqrt{3}\right)(b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3}\left((a+b x)(c+d x)\right)^{1/3}\right)^2\right)}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)(b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3}\left((a+b x)(c+d x)\right)^{1/3}}{\left(1+\sqrt{3}\right)(b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3}\left((a+b x)(c+d x)\right)^{1/3}}\right],-7-4\sqrt{3}\right]\right)\Bigg/\left(2^{2/3} b^{1/3}(b c-a d)(a+b x)^{2/3}(c+d x)^{2/3}(b c+a d+2 b d x)\sqrt{\left((b c-a d)^{2/3}\left((b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3}\left((a+b x)(c+d x)\right)^{1/3}\right)\right)\middle/\left(\left(1+\sqrt{3}\right)(b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3}\left((a+b x)(c+d x)\right)^{1/3}\right)^2}\sqrt{\left(a d+b(c+2 d x)\right)^2}\right)$$

Result (type 5, 83 leaves):

$$-\left(\left(3\,(c+d\,x)^{1/3}\left(1+\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{2/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{4}{3},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\right)\Big/\left(2\,(b\,c-a\,d)\,(a+b\,x)^{2/3}\right)\right)$$

Problem 1613: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(a+b\,x)^{8/3}\,(c+d\,x)^{2/3}}\,dx$$

Optimal (type 4, 621 leaves, 5 steps):

$$-\frac{3\,(c+d\,x)^{1/3}}{5\,(b\,c-a\,d)\,(a+b\,x)^{5/3}}+\frac{6\,d\,(c+d\,x)^{1/3}}{5\,(b\,c-a\,d)^2\,(a+b\,x)^{2/3}}+$$
$$\Bigg(2\times 2^{1/3}\times 3^{3/4}\sqrt{2+\sqrt{3}}\;d^{5/3}\left((a+b\,x)\,(c+d\,x)\right)^{2/3}$$
$$\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)$$
$$\sqrt{\left(\left((b\,c-a\,d)^{4/3}-2^{2/3}\,b^{1/3}\,d^{1/3}\,(b\,c-a\,d)^{2/3}\left((a+b\,x)\,(c+d\,x)\right)^{1/3}+2\times 2^{1/3}\,b^{2/3}\,d^{2/3}\left((a+b\,x)\,(c+d\,x)\right)^{2/3}\right)\Big/\left(\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)^2\right)}\;\text{EllipticF}\Big[$$
$$\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\left((a+b\,x)\,(c+d\,x)\right)^{1/3}}{\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\left((a+b\,x)\,(c+d\,x)\right)^{1/3}}\right],-7-4\sqrt{3}\Big]\Bigg)\Big/$$
$$\Bigg(5\,b^{1/3}\,(b\,c-a\,d)^2\,(a+b\,x)^{2/3}\,(c+d\,x)^{2/3}\,(b\,c+a\,d+2\,b\,d\,x)$$
$$\sqrt{\left(\left((b\,c-a\,d)^{2/3}\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)\right)\Big/\left(\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)^2\right)}\;\sqrt{\left(a\,d+b\,(c+2\,d\,x)\right)^2}\Bigg)$$

Result (type 5, 102 leaves):

$$\left(3\,(c+d\,x)^{1/3}\left(-b\,c+3\,a\,d+2\,b\,d\,x+2\,d\,(a+b\,x)\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{2/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{4}{3},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\right)\Big/\left(5\,(b\,c-a\,d)^2\,(a+b\,x)^{5/3}\right)$$

Problem 1614: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(a+b\,x)^{11/3}\,(c+d\,x)^{2/3}}\,dx$$

Optimal (type 4, 656 leaves, 6 steps):

$$-\frac{3\,(c+d\,x)^{1/3}}{8\,(b\,c-a\,d)\,(a+b\,x)^{8/3}}+\frac{21\,d\,(c+d\,x)^{1/3}}{40\,(b\,c-a\,d)^2\,(a+b\,x)^{5/3}}-\frac{21\,d^2\,(c+d\,x)^{1/3}}{20\,(b\,c-a\,d)^3\,(a+b\,x)^{2/3}}-\left(7\times 3^{3/4}\sqrt{2+\sqrt{3}}\;d^{8/3}\left((a+b\,x)\,(c+d\,x)\right)^{2/3}\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)\sqrt{\left(\left((b\,c-a\,d)^{4/3}-2^{2/3}\,b^{1/3}\,d^{1/3}\,(b\,c-a\,d)^{2/3}\left((a+b\,x)\,(c+d\,x)\right)^{1/3}+2\times 2^{1/3}\,b^{2/3}\,d^{2/3}\left((a+b\,x)\,(c+d\,x)\right)^{2/3}\right)\Big/\left(\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)^2\right)}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\left((a+b\,x)\,(c+d\,x)\right)^{1/3}}{\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\left((a+b\,x)\,(c+d\,x)\right)^{1/3}}\right],\,-7-4\sqrt{3}\right]\right)\Big/\left(10\times 2^{2/3}\,b^{1/3}\,(b\,c-a\,d)^3\,(a+b\,x)^{2/3}\,(c+d\,x)^{2/3}\,(b\,c+a\,d+2\,b\,d\,x)\sqrt{\left((b\,c-a\,d)^{2/3}\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)\right)\Big/\left(\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)^2}\;\sqrt{\left(a\,d+b\,(c+2\,d\,x)\right)^2}\right)$$

Result (type 5, 136 leaves):

$$\left(3\,(c+d\,x)^{1/3}\left(26\,a^2\,d^2+a\,b\,d\,(-17\,c+35\,d\,x)+b^2\,(5\,c^2-7\,c\,d\,x+14\,d^2\,x^2)+14\,d^2\,(a+b\,x)^2\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{2/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{4}{3},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\right)\Big/\left(40\,(-b\,c+a\,d)^3\,(a+b\,x)^{8/3}\right)$$

Problem 1615: Result unnecessarily involves higher level functions.

$$\int\frac{(a+b\,x)^{7/3}}{(c+d\,x)^{4/3}}\,dx$$

Optimal (type 3, 241 leaves, 4 steps):

$$-\frac{3\,(a+b\,x)^{7/3}}{d\,(c+d\,x)^{1/3}}-\frac{14\,b\,(b\,c-a\,d)\,(a+b\,x)^{1/3}\,(c+d\,x)^{2/3}}{3\,d^3}+\frac{7\,b\,(a+b\,x)^{4/3}\,(c+d\,x)^{2/3}}{2\,d^2}-\frac{14\,b^{1/3}\,(b\,c-a\,d)^2\,\text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2\,b^{1/3}\,(c+d\,x)^{1/3}}{\sqrt{3}\,d^{1/3}\,(a+b\,x)^{1/3}}\right]}{3\,\sqrt{3}\,d^{10/3}}-\frac{7\,b^{1/3}\,(b\,c-a\,d)^2\,\text{Log}[a+b\,x]}{9\,d^{10/3}}-\frac{7\,b^{1/3}\,(b\,c-a\,d)^2\,\text{Log}\left[-1+\frac{b^{1/3}\,(c+d\,x)^{1/3}}{d^{1/3}\,(a+b\,x)^{1/3}}\right]}{3\,d^{10/3}}$$

Result (type 5, 132 leaves) :

$$\frac{1}{6\,d^4\,(a+b\,x)^{2/3}}(c+d\,x)^{2/3}\left(d\,(a+b\,x)\,\left(b\,(-10\,b\,c+13\,a\,d)+3\,b^2\,d\,x-\frac{18\,(b\,c-a\,d)^2}{c+d\,x}\right)+14\,b\,(b\,c-a\,d)^2\,\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{2/3}\text{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)$$

Problem 1616: Result unnecessarily involves higher level functions.

$$\int\frac{(a+b\,x)^{4/3}}{(c+d\,x)^{4/3}}\,dx$$

Optimal (type 3, 195 leaves, 3 steps) :

$$-\frac{3\,(a+b\,x)^{4/3}}{d\,(c+d\,x)^{1/3}}+\frac{4\,b\,(a+b\,x)^{1/3}\,(c+d\,x)^{2/3}}{d^2}+\frac{4\,b^{1/3}\,(b\,c-a\,d)\,\text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2\,b^{1/3}\,(c+d\,x)^{1/3}}{\sqrt{3}\,d^{1/3}\,(a+b\,x)^{1/3}}\right]}{\sqrt{3}\,d^{7/3}}+\frac{2\,b^{1/3}\,(b\,c-a\,d)\,\text{Log}[a+b\,x]}{3\,d^{7/3}}+\frac{2\,b^{1/3}\,(b\,c-a\,d)\,\text{Log}\left[-1+\frac{b^{1/3}\,(c+d\,x)^{1/3}}{d^{1/3}\,(a+b\,x)^{1/3}}\right]}{d^{7/3}}$$

Result (type 5, 95 leaves) :

$$\frac{(a+b\,x)^{1/3}\,(c+d\,x)^{2/3}\left(\frac{4\,b\,c-3\,a\,d+b\,d\,x}{c+d\,x}+\frac{2\,b\,\text{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]}{\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{1/3}}\right)}{d^2}$$

Problem 1617: Result unnecessarily involves higher level functions.

$$\int\frac{(a+b\,x)^{1/3}}{(c+d\,x)^{4/3}}\,dx$$

Optimal (type 3, 149 leaves, 2 steps) :

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

Result (type 5, 90 leaves) :

$$\left(-6\,d\,(a+b\,x)+3\,b\,\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{2/3}(c+d\,x)\,\text{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\Big/\left(2\,d^2\,(a+b\,x)^{2/3}\,(c+d\,x)^{1/3}\right)$$

Problem 1622: Result unnecessarily involves higher level functions.

$$\int \frac{(a+b\,x)^{8/3}}{(c+d\,x)^{4/3}}\,dx$$

Optimal (type 4, 1355 leaves, 8 steps) :

$$-\frac{3\,(a+b\,x)^{8/3}}{d\,(c+d\,x)^{1/3}}-\frac{30\,b\,(b\,c-a\,d)\,(a+b\,x)^{2/3}\,(c+d\,x)^{2/3}}{7\,d^3}+\frac{24\,b\,(a+b\,x)^{5/3}\,(c+d\,x)^{2/3}}{7\,d^2}+$$

$$\left(30\times 2^{2/3}\,b^{1/3}\,(b\,c-a\,d)^2\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)\Big/$$
$$\left(7\,d^{11/3}\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}\,(b\,c+a\,d+2\,b\,d\,x)\right.$$
$$\left.\left(\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)\right)-$$

$$\left(15\times 2^{2/3}\times 3^{1/4}\sqrt{2-\sqrt{3}}\;b^{1/3}\,(b\,c-a\,d)^{8/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\right.$$
$$\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)\sqrt{\left(\left((b\,c-a\,d)^{4/3}-2^{2/3}\,b^{1/3}\,d^{1/3}\right.\right.}$$
$$\left.(b\,c-a\,d)^{2/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}+2\times 2^{1/3}\,b^{2/3}\,d^{2/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{2/3}\right)\Big/$$
$$\left(\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)^2\Big)\;\mathrm{EllipticE}\Big[$$
$$\left.\mathrm{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}}{\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}}\right],\,-7-4\sqrt{3}\,\Big]\right)\Big/$$
$$\left(7\,d^{11/3}\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}\,(b\,c+a\,d+2\,b\,d\,x)\right.$$
$$\sqrt{\left(\left((b\,c-a\,d)^{2/3}\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)\right)\Big/\right.}$$
$$\left.\overline{\left.\left(\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)^2\right)}\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)+$$

$$\left(20\times 2^{1/6}\times 3^{3/4}\,b^{1/3}\,(b\,c-a\,d)^{8/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\right.$$
$$\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)$$
$$\sqrt{\left(\left((b\,c-a\,d)^{4/3}-2^{2/3}\,b^{1/3}\,d^{1/3}\,(b\,c-a\,d)^{2/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}+\right.\right.}$$
$$\left.2\times 2^{1/3}\,b^{2/3}\,d^{2/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{2/3}\right)\Big/$$
$$\left(\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)^2\Big)\;\mathrm{EllipticF}\Big[$$
$$\left.\mathrm{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}}{\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}}\right],\,-7-4\sqrt{3}\,\Big]\right)\Big/$$
$$\left(7\,d^{11/3}\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}\,(b\,c+a\,d+2\,b\,d\,x)\right.$$
$$\sqrt{\left(\left((b\,c-a\,d)^{2/3}\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)\right)\Big/\right.}$$
$$\left.\overline{\left.\left(\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)^2\right)}\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)$$

Result (type 5, 131 leaves):

$$\frac{1}{7\,d^4\,(a+b\,x)^{1/3}}3\,(c+d\,x)^{2/3}\left(d\,(a+b\,x)\,\left(b\,(-3\,b\,c+4\,a\,d)+b^2\,d\,x-\frac{7\,(b\,c-a\,d)^2}{c+d\,x}\right)+\right.$$
$$\left.10\,b\,(b\,c-a\,d)^2\,\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{1/3}\,\text{Hypergeometric2F1}\left[\frac{1}{3},\,\frac{2}{3},\,\frac{5}{3},\,\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)$$

Problem 1623: Result unnecessarily involves higher level functions.

$$\int\frac{(a+b\,x)^{5/3}}{(c+d\,x)^{4/3}}\,dx$$

Optimal (type 4, 1317 leaves, 7 steps):

$$-\frac{3\,(a+b\,x)^{5/3}}{d\,(c+d\,x)^{1/3}}+\frac{15\,b\,(a+b\,x)^{2/3}\,(c+d\,x)^{2/3}}{4\,d^2}-$$

$$\left(15\,b^{1/3}\,(b\,c-a\,d)\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)\Big/$$
$$\left(2\times 2^{1/3}\,d^{8/3}\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}\,(b\,c+a\,d+2\,b\,d\,x)\right.$$
$$\left.\left(\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)\right)+$$

$$\left(15\times 3^{1/4}\sqrt{2-\sqrt{3}}\;b^{1/3}\,(b\,c-a\,d)^{5/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\right.$$
$$\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)\sqrt{\left(\left((b\,c-a\,d)^{4/3}-2^{2/3}\,b^{1/3}\,d^{1/3}\right.\right.}$$
$$\left.(b\,c-a\,d)^{2/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}+2\times 2^{1/3}\,b^{2/3}\,d^{2/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{2/3}\right)\Big/$$
$$\left.\left(\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)^2\right)\,\text{EllipticE}\Big[$$
$$\left.\text{ArcSin}\Big[\frac{\left(1-\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}}{\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}}\Big],\,-7-4\sqrt{3}\Big]\right)\Big/$$
$$\left(4\times 2^{1/3}\,d^{8/3}\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}\,(b\,c+a\,d+2\,b\,d\,x)\right.$$
$$\sqrt{\left(\left((b\,c-a\,d)^{2/3}\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)\right)\Big/\right.}$$
$$\left.\left.\left(\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)^2\right)}\;\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)-$$

$$\left(5\times 3^{3/4}\,b^{1/3}\,(b\,c-a\,d)^{5/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\right.$$
$$\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)$$
$$\sqrt{\left(\left((b\,c-a\,d)^{4/3}-2^{2/3}\,b^{1/3}\,d^{1/3}\,(b\,c-a\,d)^{2/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}+\right.\right.}$$
$$\left.2\times 2^{1/3}\,b^{2/3}\,d^{2/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{2/3}\right)\Big/$$
$$\left.\left(\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)^2\right)\,\text{EllipticF}\Big[$$
$$\left.\text{ArcSin}\Big[\frac{\left(1-\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}}{\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}}\Big],\,-7-4\sqrt{3}\Big]\right)\Big/$$
$$\left(2^{5/6}\,d^{8/3}\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}\,(b\,c+a\,d+2\,b\,d\,x)\right.$$
$$\sqrt{\left(\left((b\,c-a\,d)^{2/3}\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)\right)\Big/\right.}$$
$$\left.\left.\left(\left(1+\sqrt{3}\right)(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/3}\right)^2\right)}\;\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)$$

Result (type 5, 98 leaves) :

$$\frac{1}{4\,d^2}3\,(a+b\,x)^{2/3}\,(c+d\,x)^{2/3}\left(\frac{5\,b\,c-4\,a\,d+b\,d\,x}{c+d\,x}+\frac{5\,b\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{5}{3},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]}{\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{2/3}}\right)$$

Problem 1624: Result unnecessarily involves higher level functions.

$$\int \frac{(a+b x)^{2/3}}{(c+d x)^{4/3}} \, dx$$

Optimal (type 4, 1279 leaves, 6 steps):

$$-\frac{3 (a+b x)^{2/3}}{d (c+d x)^{1/3}}+\left(3\times 2^{2/3} b^{1/3} \left((a+b x) (c+d x)\right)^{1/3} \sqrt{(b c+a d+2 b d x)^2} \sqrt{\left(a d+b (c+2 d x)\right)^2}\right)\Big/ \left(d^{5/3} (a+b x)^{1/3} (c+d x)^{1/3} (b c+a d+2 b d x) \left(\left(1+\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} \left((a+b x) (c+d x)\right)^{1/3}\right)\right)-$$
$$\left(3\times 3^{1/4} \sqrt{2-\sqrt{3}}\, b^{1/3} (b c-a d)^{2/3} \left((a+b x) (c+d x)\right)^{1/3} \sqrt{(b c+a d+2 b d x)^2} \left((b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} \left((a+b x) (c+d x)\right)^{1/3}\right) \sqrt{\left(\left((b c-a d)^{4/3}-2^{2/3} b^{1/3} d^{1/3} (b c-a d)^{2/3} \left((a+b x) (c+d x)\right)^{1/3}+2\times 2^{1/3} b^{2/3} d^{2/3} \left((a+b x) (c+d x)\right)^{2/3}\right)\Big/\left(\left(1+\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} \left((a+b x) (c+d x)\right)^{1/3}\right)^2\right)} \text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} \left((a+b x) (c+d x)\right)^{1/3}}{\left(1+\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} \left((a+b x) (c+d x)\right)^{1/3}}\right],-7-4 \sqrt{3}\right]\right)\Big/$$
$$\left(2^{1/3} d^{5/3} (a+b x)^{1/3} (c+d x)^{1/3} (b c+a d+2 b d x) \sqrt{\left(\left((b c-a d)^{2/3} \left((b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} \left((a+b x) (c+d x)\right)^{1/3}\right)\right)\Big/\left(\left(1+\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} \left((a+b x) (c+d x)\right)^{1/3}\right)^2\right)} \sqrt{\left(a d+b (c+2 d x)\right)^2}\right)+$$
$$\left(2\times 2^{1/6}\times 3^{3/4} b^{1/3} (b c-a d)^{2/3} \left((a+b x) (c+d x)\right)^{1/3} \sqrt{(b c+a d+2 b d x)^2} \left((b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} \left((a+b x) (c+d x)\right)^{1/3}\right) \sqrt{\left(\left((b c-a d)^{4/3}-2^{2/3} b^{1/3} d^{1/3} (b c-a d)^{2/3} \left((a+b x) (c+d x)\right)^{1/3}+2\times 2^{1/3} b^{2/3} d^{2/3} \left((a+b x) (c+d x)\right)^{2/3}\right)\Big/\left(\left(1+\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} \left((a+b x) (c+d x)\right)^{1/3}\right)^2\right)} \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} \left((a+b x) (c+d x)\right)^{1/3}}{\left(1+\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} \left((a+b x) (c+d x)\right)^{1/3}}\right],-7-4 \sqrt{3}\right]\right)\Big/$$
$$\left(d^{5/3} (a+b x)^{1/3} (c+d x)^{1/3} (b c+a d+2 b d x) \sqrt{\left(\left((b c-a d)^{2/3} \left((b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} \left((a+b x) (c+d x)\right)^{1/3}\right)\right)\Big/\left(\left(1+\sqrt{3}\right) (b c-a d)^{2/3}+2^{2/3} b^{1/3} d^{1/3} \left((a+b x) (c+d x)\right)^{1/3}\right)^2\right)} \sqrt{\left(a d+b (c+2 d x)\right)^2}\right)$$

Result (type 5, 87 leaves):

$$\left(-3\,d\,(a+b\,x)+3\,b\,\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{1/3}(c+d\,x)\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{5}{3},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\Big/\left(d^2\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}\right)$$

Problem 1625: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(a+b\,x)^{1/3}\,(c+d\,x)^{4/3}}\,dx$$

Optimal (type 4, 1298 leaves, 6 steps) :

$$\frac{3\,(a+b\,x)^{2/3}}{(b\,c-a\,d)\,(c+d\,x)^{1/3}}-\Big(3\,b^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\,\sqrt{\big(a\,d+b\,(c+2\,d\,x)\big)^2}\Big)\Big/$$
$$\Big(2^{1/3}\,d^{2/3}\,(b\,c-a\,d)\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}\,(b\,c+a\,d+2\,b\,d\,x)$$
$$\Big(\big(1+\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)\Big)+$$
$$\Big(3\times 3^{1/4}\,\sqrt{2-\sqrt{3}}\,b^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}$$
$$\Big((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)\,\sqrt{\Big(\Big((b\,c-a\,d)^{4/3}-2^{2/3}\,b^{1/3}\,d^{1/3}}$$
$$\overline{(b\,c-a\,d)^{2/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}+2\times 2^{1/3}\,b^{2/3}\,d^{2/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{2/3}\Big)\Big/}$$
$$\overline{\Big(\big(1+\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)^2\Big)}\ \text{EllipticE}\Big[$$
$$\text{ArcSin}\Big[\frac{\big(1-\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}}{\big(1+\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}}\Big],\,-7-4\,\sqrt{3}\Big]\Big)\Big/$$
$$\Big(2\times 2^{1/3}\,d^{2/3}\,(b\,c-a\,d)^{1/3}\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}\,(b\,c+a\,d+2\,b\,d\,x)$$
$$\sqrt{\Big((b\,c-a\,d)^{2/3}\,\Big((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)\Big)\Big/}$$
$$\overline{\Big(\big(1+\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)^2\Big)}\,\sqrt{\big(a\,d+b\,(c+2\,d\,x)\big)^2}\Big)-$$
$$\Big(2^{1/6}\times 3^{3/4}\,b^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}$$
$$\Big((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)$$
$$\sqrt{\Big(\Big((b\,c-a\,d)^{4/3}-2^{2/3}\,b^{1/3}\,d^{1/3}\,(b\,c-a\,d)^{2/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}+}$$
$$\overline{2\times 2^{1/3}\,b^{2/3}\,d^{2/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{2/3}\Big)\Big/}$$
$$\overline{\Big(\big(1+\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)^2\Big)}\ \text{EllipticF}\Big[$$
$$\text{ArcSin}\Big[\frac{\big(1-\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}}{\big(1+\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}}\Big],\,-7-4\,\sqrt{3}\Big]\Big)\Big/$$
$$\Big(d^{2/3}\,(b\,c-a\,d)^{1/3}\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}\,(b\,c+a\,d+2\,b\,d\,x)$$
$$\sqrt{\Big((b\,c-a\,d)^{2/3}\,\Big((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)\Big)\Big/}$$
$$\overline{\Big(\big(1+\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)^2\Big)}\,\sqrt{\big(a\,d+b\,(c+2\,d\,x)\big)^2}\Big)$$

Result (type 5, 100 leaves):

$$\Big(6\,d\,(a+b\,x)-3\,b\,\Big(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\Big)^{1/3}\,(c+d\,x)\,\text{Hypergeometric2F1}\Big[\frac{1}{3},\,\frac{2}{3},\,\frac{5}{3},\,\frac{b\,(c+d\,x)}{b\,c-a\,d}\Big]\Big)\Big/$$
$$\Big(2\,d\,(b\,c-a\,d)\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}\Big)$$

Problem 1626: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a+b\,x)^{4/3}\,(c+d\,x)^{4/3}}\,dx$$

Optimal (type 4, 1327 leaves, 7 steps):

$$-\frac{3}{(b\,c-a\,d)\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}}-\frac{6\,d\,(a+b\,x)^{2/3}}{(b\,c-a\,d)^2\,(c+d\,x)^{1/3}}+\left(3\times 2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)\Big/\left(\left((b\,c-a\,d)^2\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}\,(b\,c+a\,d+2\,b\,d\,x)\right.\right.$$
$$\left.\left.\left(\left(1+\sqrt{3}\right)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}\right)\right)\right)-$$
$$\left(3\times 3^{1/4}\,\sqrt{2-\sqrt{3}}\;b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\right.$$
$$\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}\right)\sqrt{\left(\left((b\,c-a\,d)^{4/3}-2^{2/3}\,b^{1/3}\,d^{1/3}\right.\right.}$$
$$\overline{\left.\left.(b\,c-a\,d)^{2/3}\,((a+b\,x)\,(c+d\,x))^{1/3}+2\times 2^{1/3}\,b^{2/3}\,d^{2/3}\,((a+b\,x)\,(c+d\,x))^{2/3}\right)\Big/\right.}$$
$$\overline{\left.\left(\left(1+\sqrt{3}\right)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}\right)^2\right)}\;\text{EllipticE}\Big[$$
$$\left.\text{ArcSin}\Big[\frac{\left(1-\sqrt{3}\right)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}}{\left(1+\sqrt{3}\right)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}}\Big],\,-7-4\,\sqrt{3}\Big]\right)\Big/$$
$$\left(2^{1/3}\,(b\,c-a\,d)^{4/3}\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}\,(b\,c+a\,d+2\,b\,d\,x)\right.$$
$$\sqrt{\left(\left((b\,c-a\,d)^{2/3}\,\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}\right)\right)\Big/\right.}$$
$$\left.\overline{\left.\left(\left(1+\sqrt{3}\right)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}\right)^2\right)}\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)+$$
$$\left(2\times 2^{1/6}\times 3^{3/4}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\right.$$
$$\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}\right)$$
$$\sqrt{\left(\left((b\,c-a\,d)^{4/3}-2^{2/3}\,b^{1/3}\,d^{1/3}\,(b\,c-a\,d)^{2/3}\,((a+b\,x)\,(c+d\,x))^{1/3}+\right.\right.}$$
$$\overline{\left.2\times 2^{1/3}\,b^{2/3}\,d^{2/3}\,((a+b\,x)\,(c+d\,x))^{2/3}\right)\Big/}$$
$$\overline{\left.\left(\left(1+\sqrt{3}\right)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}\right)^2\right)}\;\text{EllipticF}\Big[$$
$$\left.\text{ArcSin}\Big[\frac{\left(1-\sqrt{3}\right)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}}{\left(1+\sqrt{3}\right)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}}\Big],\,-7-4\,\sqrt{3}\Big]\right)\Big/$$
$$\left((b\,c-a\,d)^{4/3}\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}\,(b\,c+a\,d+2\,b\,d\,x)\right.$$
$$\sqrt{\left(\left((b\,c-a\,d)^{2/3}\,\left((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}\right)\right)\Big/\right.}$$
$$\left.\overline{\left.\left(\left(1+\sqrt{3}\right)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,((a+b\,x)\,(c+d\,x))^{1/3}\right)^2\right)}\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)$$

Result (type 5, 98 leaves) :

$$-\left(\left(3\left(a d+b (c+2 d x)-b \left(\frac{d (a+b x)}{-b c+a d}\right)^{1/3} (c+d x)\ \text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{5}{3},\frac{b (c+d x)}{b c-a d}\right]\right)\right)\Big/\left((b c-a d)^2 (a+b x)^{1/3} (c+d x)^{1/3}\right)\right)$$

Problem 1627: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a+b x)^{7/3} (c+d x)^{4/3}}\, dx$$

Optimal (type 4, 1370 leaves, 8 steps) :

$$
\begin{aligned}
&-\frac{3}{4\,(b\,c-a\,d)\,(a+b\,x)^{4/3}\,(c+d\,x)^{1/3}}+\frac{15\,d}{4\,(b\,c-a\,d)^{2}\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}}+\frac{15\,d^{2}\,(a+b\,x)^{2/3}}{2\,(b\,c-a\,d)^{3}\,(c+d\,x)^{1/3}}-\\
&\Big(15\,b^{1/3}\,d^{4/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^{2}}\,\sqrt{\big(a\,d+b\,(c+2\,d\,x)\big)^{2}}\Big)\Big/\\
&\quad\Big(2\times 2^{1/3}\,(b\,c-a\,d)^{3}\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}\,(b\,c+a\,d+2\,b\,d\,x)\\
&\qquad\Big(\big(1+\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)\Big)+\\
&\Big(15\times 3^{1/4}\,\sqrt{2-\sqrt{3}}\;b^{1/3}\,d^{4/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^{2}}\\
&\qquad\Big((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)\sqrt{\Big(\Big((b\,c-a\,d)^{4/3}-2^{2/3}\,b^{1/3}\,d^{1/3}\\
&\qquad\qquad(b\,c-a\,d)^{2/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}+2\times 2^{1/3}\,b^{2/3}\,d^{2/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{2/3}\Big)\Big/\\
&\qquad\quad\Big(\big(1+\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)^{2}\Big)}\;\text{EllipticE}\Big[\\
&\qquad\text{ArcSin}\Big[\frac{\big(1-\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}}{\big(1+\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}}\Big],\,-7-4\,\sqrt{3}\Big]\Big)\Big/\\
&\quad\Big(4\times 2^{1/3}\,(b\,c-a\,d)^{7/3}\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}\,(b\,c+a\,d+2\,b\,d\,x)\\
&\qquad\sqrt{\Big(\Big((b\,c-a\,d)^{2/3}\,\Big((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)\Big)\Big/}\\
&\qquad\quad\overline{\Big(\big(1+\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)^{2}\Big)}\;\sqrt{\big(a\,d+b\,(c+2\,d\,x)\big)^{2}}\Big)-\\
&\Big(5\times 3^{3/4}\,b^{1/3}\,d^{4/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^{2}}\\
&\qquad\Big((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)\\
&\qquad\sqrt{\Big(\Big((b\,c-a\,d)^{4/3}-2^{2/3}\,b^{1/3}\,d^{1/3}\,(b\,c-a\,d)^{2/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}+}\\
&\qquad\qquad\overline{2\times 2^{1/3}\,b^{2/3}\,d^{2/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{2/3}\Big)\Big/}\\
&\qquad\quad\overline{\Big(\big(1+\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)^{2}\Big)}\;\text{EllipticF}\Big[\\
&\qquad\text{ArcSin}\Big[\frac{\big(1-\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}}{\big(1+\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}}\Big],\,-7-4\,\sqrt{3}\Big]\Big)\Big/\\
&\quad\Big(2^{5/6}\,(b\,c-a\,d)^{7/3}\,(a+b\,x)^{1/3}\,(c+d\,x)^{1/3}\,(b\,c+a\,d+2\,b\,d\,x)\\
&\qquad\sqrt{\Big(\Big((b\,c-a\,d)^{2/3}\,\Big((b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)\Big)\Big/}\\
&\qquad\quad\overline{\Big(\big(1+\sqrt{3}\big)\,(b\,c-a\,d)^{2/3}+2^{2/3}\,b^{1/3}\,d^{1/3}\,\big((a+b\,x)\,(c+d\,x)\big)^{1/3}\Big)^{2}\Big)}\;\sqrt{\big(a\,d+b\,(c+2\,d\,x)\big)^{2}}\Big)
\end{aligned}
$$

Result (type 5, 138 leaves) :

$$-\left(\left(3\left(4 a^2 d^2+a b d\,(7 c+15 d x)+b^2\left(-c^2+5 c d x+10 d^2 x^2\right)-5 b d\,(a+b x)\left(\frac{d\,(a+b x)}{-b c+a d}\right)^{1/3}(c+d x)\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{5}{3},\frac{b\,(c+d x)}{b c-a d}\right]\right)\right)\Big/\left(4\,(-b c+a d)^3\,(a+b x)^{4/3}\,(c+d x)^{1/3}\right)\right)$$

Problem 1628: Result unnecessarily involves higher level functions.

$$\int \frac{(-1+x)^{1/3}}{(1+x)^{1/3}}\,dx$$

Optimal (type 3, 77 leaves, 2 steps):

$$(-1+x)^{1/3}\,(1+x)^{2/3}+\frac{2\,\text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2\,(1+x)^{1/3}}{\sqrt{3}\,(-1+x)^{1/3}}\right]}{\sqrt{3}}+\frac{1}{3}\,\text{Log}[-1+x]+\text{Log}\left[-1+\frac{(1+x)^{1/3}}{(-1+x)^{1/3}}\right]$$

Result (type 5, 50 leaves):

$$\left(\frac{-1+x}{1+x}\right)^{1/3}\left(1+x-2^{2/3}\,(1+x)^{1/3}\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},\frac{1-x}{2}\right]\right)$$

Problem 1629: Result unnecessarily involves higher level functions.

$$\int (a+b x)^{3/2}\,(c+d x)^{1/4}\,dx$$

Optimal (type 4, 185 leaves, 6 steps):

$$-\frac{8\,(b c-a d)^2\,\sqrt{a+b x}\,(c+d x)^{1/4}}{77\,b\,d^2}+\frac{4\,(b c-a d)\,(a+b x)^{3/2}\,(c+d x)^{1/4}}{77\,b\,d}+\frac{4\,(a+b x)^{5/2}\,(c+d x)^{1/4}}{11\,b}+\frac{16\,(b c-a d)^{13/4}\,\sqrt{-\frac{d\,(a+b x)}{b c-a d}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d x)^{1/4}}{(b c-a d)^{1/4}}\right],-1\right]}{77\,b^{5/4}\,d^3\,\sqrt{a+b x}}$$

Result (type 5, 140 leaves):

$$-\frac{1}{77\,b\,d^3\,\sqrt{a+b x}}4\,(c+d x)^{1/4}\left(-d\,(a+b x)\left(4 a^2 d^2+a b d\,(5 c+13 d x)+b^2\left(-2 c^2+c d x+7 d^2 x^2\right)\right)-4\,(b c-a d)^3\sqrt{\frac{d\,(a+b x)}{-b c+a d}}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},\frac{b\,(c+d x)}{b c-a d}\right]\right)$$

Problem 1630: Result unnecessarily involves higher level functions.

$$\int \sqrt{a+b x}\, (c+d x)^{1/4}\, dx$$

Optimal (type 4, 147 leaves, 5 steps):

$$\frac{4 (b c-a d) \sqrt{a+b x}\, (c+d x)^{1/4}}{21 b d}+\frac{4 (a+b x)^{3/2} (c+d x)^{1/4}}{7 b}-\frac{8 (b c-a d)^{9/4} \sqrt{-\frac{d (a+b x)}{b c-a d}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4} (c+d x)^{1/4}}{(b c-a d)^{1/4}}\right],-1\right]}{21 b^{5/4} d^2 \sqrt{a+b x}}$$

Result (type 5, 109 leaves):

$$\frac{1}{21 b d^2 \sqrt{a+b x}} 4 (c+d x)^{1/4} \left(d (a+b x) (2 a d+b (c+3 d x))-2 (b c-a d)^2 \sqrt{\frac{d (a+b x)}{-b c+a d}}\, \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},\frac{b (c+d x)}{b c-a d}\right]\right)$$

Problem 1631: Result unnecessarily involves higher level functions.

$$\int \frac{(c+d x)^{1/4}}{\sqrt{a+b x}}\, dx$$

Optimal (type 4, 111 leaves, 4 steps):

$$\frac{4 \sqrt{a+b x}\, (c+d x)^{1/4}}{3 b}+\frac{4 (b c-a d)^{5/4} \sqrt{-\frac{d (a+b x)}{b c-a d}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4} (c+d x)^{1/4}}{(b c-a d)^{1/4}}\right],-1\right]}{3 b^{5/4} d \sqrt{a+b x}}$$

Result (type 5, 93 leaves):

$$\frac{1}{3 b d \sqrt{a+b x}} 4 (c+d x)^{1/4} \left(d (a+b x)+(b c-a d) \sqrt{\frac{d (a+b x)}{-b c+a d}}\, \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},\frac{b (c+d x)}{b c-a d}\right]\right)$$

Problem 1632: Result unnecessarily involves higher level functions.

$$\int \frac{(c+d x)^{1/4}}{(a+b x)^{3/2}}\, dx$$

Optimal (type 4, 104 leaves, 4 steps):

$$-\frac{2\,(c+d\,x)^{1/4}}{b\,\sqrt{a+b\,x}}+\frac{2\,(b\,c-a\,d)^{1/4}\,\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{b^{5/4}\,\sqrt{a+b\,x}}$$

Result (type 5, 74 leaves):

$$\frac{2\,(c+d\,x)^{1/4}\left(-1+\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\;\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)}{b\,\sqrt{a+b\,x}}$$

Problem 1633: Result unnecessarily involves higher level functions.

$$\int\frac{(c+d\,x)^{1/4}}{(a+b\,x)^{5/2}}\,dx$$

Optimal (type 4, 145 leaves, 5 steps):

$$-\frac{2\,(c+d\,x)^{1/4}}{3\,b\,(a+b\,x)^{3/2}}-\frac{d\,(c+d\,x)^{1/4}}{3\,b\,(b\,c-a\,d)\,\sqrt{a+b\,x}}-\frac{d\,\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{3\,b^{5/4}\,(b\,c-a\,d)^{3/4}\,\sqrt{a+b\,x}}$$

Result (type 5, 103 leaves):

$$\left((c+d\,x)^{1/4}\left(2\,b\,c-a\,d+b\,d\,x+d\,(a+b\,x)\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\;\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\right)\Big/\left(3\,b\,(-b\,c+a\,d)\,(a+b\,x)^{3/2}\right)$$

Problem 1634: Result unnecessarily involves higher level functions.

$$\int\frac{(c+d\,x)^{1/4}}{(a+b\,x)^{7/2}}\,dx$$

Optimal (type 4, 185 leaves, 6 steps):

$$-\frac{2\,(c+d\,x)^{1/4}}{5\,b\,(a+b\,x)^{5/2}}-\frac{d\,(c+d\,x)^{1/4}}{15\,b\,(b\,c-a\,d)\,(a+b\,x)^{3/2}}+\frac{d^2\,(c+d\,x)^{1/4}}{6\,b\,(b\,c-a\,d)^2\,\sqrt{a+b\,x}}+\frac{d^2\,\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{6\,b^{5/4}\,(b\,c-a\,d)^{7/4}\,\sqrt{a+b\,x}}$$

Result (type 5, 140 leaves):

$$\left((c+d x)^{1/4}\left(-5 a^2 d^2+2 a b d (11 c+6 d x)+b^2 \left(-12 c^2-2 c d x+5 d^2 x^2\right)+5 d^2 (a+b x)^2 \sqrt{\frac{d (a+b x)}{-b c+a d}}\ \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},\frac{b (c+d x)}{b c-a d}\right]\right)\right)\Big/\left(30 b (b c-a d)^2 (a+b x)^{5/2}\right)$$

Problem 1635: Result unnecessarily involves higher level functions.

$$\int (a+b x)^{3/2} (c+d x)^{3/4}\, dx$$

Optimal (type 4, 270 leaves, 10 steps):

$$-\frac{8 (b c-a d)^2 \sqrt{a+b x} (c+d x)^{3/4}}{65 b d^2}+\frac{4 (b c-a d) (a+b x)^{3/2} (c+d x)^{3/4}}{39 b d}+\frac{4 (a+b x)^{5/2} (c+d x)^{3/4}}{13 b}+\frac{16 (b c-a d)^{15/4} \sqrt{-\frac{d (a+b x)}{b c-a d}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{b^{1/4} (c+d x)^{1/4}}{(b c-a d)^{1/4}}\right],-1\right]}{65 b^{7/4} d^3 \sqrt{a+b x}}-\frac{16 (b c-a d)^{15/4} \sqrt{-\frac{d (a+b x)}{b c-a d}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4} (c+d x)^{1/4}}{(b c-a d)^{1/4}}\right],-1\right]}{65 b^{7/4} d^3 \sqrt{a+b x}}$$

Result (type 5, 141 leaves):

$$-\frac{1}{195 b d^3 \sqrt{a+b x}} 4 (c+d x)^{3/4}\left(-d (a+b x) \left(4 a^2 d^2+a b d (17 c+25 d x)+b^2 \left(-6 c^2+5 c d x+15 d^2 x^2\right)\right)-4 (b c-a d)^3 \sqrt{\frac{d (a+b x)}{-b c+a d}}\ \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},\frac{b (c+d x)}{b c-a d}\right]\right)$$

Problem 1636: Result unnecessarily involves higher level functions.

$$\int \sqrt{a+b x}\, (c+d x)^{3/4}\, dx$$

Optimal (type 4, 232 leaves, 9 steps):

$$\frac{4\,(b\,c-a\,d)\,\sqrt{a+b\,x}\,(c+d\,x)^{3/4}}{15\,b\,d}+\frac{4\,(a+b\,x)^{3/2}\,(c+d\,x)^{3/4}}{9\,b}-\frac{8\,(b\,c-a\,d)^{11/4}\,\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{15\,b^{7/4}\,d^2\,\sqrt{a+b\,x}}+\frac{8\,(b\,c-a\,d)^{11/4}\,\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{15\,b^{7/4}\,d^2\,\sqrt{a+b\,x}}$$

Result (type 5, 110 leaves):

$$\frac{1}{45\,b\,d^2\,\sqrt{a+b\,x}}4\,(c+d\,x)^{3/4}\left(d\,(a+b\,x)\,(3\,b\,c+2\,a\,d+5\,b\,d\,x)-2\,(b\,c-a\,d)^2\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)$$

Problem 1637: Result unnecessarily involves higher level functions.

$$\int\frac{(c+d\,x)^{3/4}}{\sqrt{a+b\,x}}\,dx$$

Optimal (type 4, 196 leaves, 8 steps):

$$\frac{4\,\sqrt{a+b\,x}\,(c+d\,x)^{3/4}}{5\,b}+\frac{12\,(b\,c-a\,d)^{7/4}\,\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{5\,b^{7/4}\,d\,\sqrt{a+b\,x}}-\frac{12\,(b\,c-a\,d)^{7/4}\,\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{5\,b^{7/4}\,d\,\sqrt{a+b\,x}}$$

Result (type 5, 93 leaves):

$$\frac{1}{5\,b\,d\,\sqrt{a+b\,x}}4\,(c+d\,x)^{3/4}\left(d\,(a+b\,x)+(b\,c-a\,d)\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)$$

Problem 1638: Result unnecessarily involves higher level functions.

$$\int \frac{(c+d x)^{3/4}}{(a+b x)^{3/2}} \, dx$$

Optimal (type 4, 184 leaves, 8 steps):

$$-\frac{2 (c+d x)^{3/4}}{b \sqrt{a+b x}}+\frac{6 (b c-a d)^{3/4} \sqrt{-\frac{d (a+b x)}{b c-a d}} \text{EllipticE}\left[\text{ArcSin}\left[\frac{b^{1/4} (c+d x)^{1/4}}{(b c-a d)^{1/4}}\right],-1\right]}{b^{7/4} \sqrt{a+b x}}-\frac{6 (b c-a d)^{3/4} \sqrt{-\frac{d (a+b x)}{b c-a d}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4} (c+d x)^{1/4}}{(b c-a d)^{1/4}}\right],-1\right]}{b^{7/4} \sqrt{a+b x}}$$

Result (type 5, 74 leaves):

$$\frac{2 (c+d x)^{3/4} \left(-1+\sqrt{\frac{d (a+b x)}{-b c+a d}} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},\frac{b (c+d x)}{b c-a d}\right]\right)}{b \sqrt{a+b x}}$$

Problem 1639: Result unnecessarily involves higher level functions.

$$\int \frac{(c+d x)^{3/4}}{(a+b x)^{5/2}} \, dx$$

Optimal (type 4, 221 leaves, 9 steps):

$$-\frac{2 (c+d x)^{3/4}}{3 b (a+b x)^{3/2}}-\frac{d (c+d x)^{3/4}}{b (b c-a d) \sqrt{a+b x}}+\frac{d \sqrt{-\frac{d (a+b x)}{b c-a d}} \text{EllipticE}\left[\text{ArcSin}\left[\frac{b^{1/4} (c+d x)^{1/4}}{(b c-a d)^{1/4}}\right],-1\right]}{b^{7/4} (b c-a d)^{1/4} \sqrt{a+b x}}-\frac{d \sqrt{-\frac{d (a+b x)}{b c-a d}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4} (c+d x)^{1/4}}{(b c-a d)^{1/4}}\right],-1\right]}{b^{7/4} (b c-a d)^{1/4} \sqrt{a+b x}}$$

Result (type 5, 104 leaves):

$$\left((c+d x)^{3/4} \left(2 b c+a d+3 b d x-d (a+b x) \sqrt{\frac{d (a+b x)}{-b c+a d}} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},\frac{b (c+d x)}{b c-a d}\right]\right)\right) \Big/ \left(3 b (-b c+a d) (a+b x)^{3/2}\right)$$

Problem 1640: Result unnecessarily involves higher level functions.

$$\int \frac{(c+d x)^{3/4}}{(a+b x)^{7/2}}\, dx$$

Optimal (type 4, 270 leaves, 10 steps):

$$-\frac{2 (c+d x)^{3/4}}{5 b (a+b x)^{5/2}}-\frac{d (c+d x)^{3/4}}{5 b (b c-a d) (a+b x)^{3/2}}+\frac{3 d^2 (c+d x)^{3/4}}{10 b (b c-a d)^2 \sqrt{a+b x}}-\frac{3 d^2 \sqrt{-\frac{d (a+b x)}{b c-a d}}\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{b^{1/4} (c+d x)^{1/4}}{(b c-a d)^{1/4}}\right],-1\right]}{10 b^{7/4} (b c-a d)^{5/4} \sqrt{a+b x}}+\frac{3 d^2 \sqrt{-\frac{d (a+b x)}{b c-a d}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4} (c+d x)^{1/4}}{(b c-a d)^{1/4}}\right],-1\right]}{10 b^{7/4} (b c-a d)^{5/4} \sqrt{a+b x}}$$

Result (type 5, 140 leaves):

$$\left((c+d x)^{3/4} \left(a^2 d^2+2 a b d (3 c+4 d x)-b^2 \left(4 c^2+2 c d x-3 d^2 x^2\right)-d^2 (a+b x)^2 \sqrt{\frac{d (a+b x)}{-b c+a d}}\, \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},\frac{b (c+d x)}{b c-a d}\right]\right)\right) \Big/ \left(10 b (b c-a d)^2 (a+b x)^{5/2}\right)$$

Problem 1641: Result unnecessarily involves higher level functions.

$$\int (a+b x)^{3/2} (c+d x)^{5/4}\, dx$$

Optimal (type 4, 220 leaves, 7 steps):

$$-\frac{8 (b c-a d)^3 \sqrt{a+b x} (c+d x)^{1/4}}{231 b^2 d^2}+\frac{4 (b c-a d)^2 (a+b x)^{3/2} (c+d x)^{1/4}}{231 b^2 d}+\frac{4 (b c-a d) (a+b x)^{5/2} (c+d x)^{1/4}}{33 b^2}+\frac{4 (a+b x)^{5/2} (c+d x)^{5/4}}{15 b}+\frac{16 (b c-a d)^{17/4} \sqrt{-\frac{d (a+b x)}{b c-a d}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4} (c+d x)^{1/4}}{(b c-a d)^{1/4}}\right],-1\right]}{231 b^{9/4} d^3 \sqrt{a+b x}}$$

Result (type 5, 182 leaves):

$$\left(4\,(c+d\,x)^{1/4}\left(-d\,(a+b\,x)\,\left(20\,a^3\,d^3-12\,a^2\,b\,d^2\,(6\,c+d\,x)-a\,b^2\,d\,\left(35\,c^2+214\,c\,d\,x+119\,d^2\,x^2\right)+b^3\,\left(10\,c^3-5\,c^2\,d\,x-112\,c\,d^2\,x^2-77\,d^3\,x^3\right)\right)+20\,(b\,c-a\,d)^4\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\right)\Big/\left(1155\,b^2\,d^3\,\sqrt{a+b\,x}\right)$$

Problem 1642: Result unnecessarily involves higher level functions.

$$\int \sqrt{a+b\,x}\,(c+d\,x)^{5/4}\,dx$$

Optimal (type 4, 182 leaves, 6 steps):

$$\frac{20\,(b\,c-a\,d)^2\,\sqrt{a+b\,x}\,(c+d\,x)^{1/4}}{231\,b^2\,d}+\frac{20\,(b\,c-a\,d)\,(a+b\,x)^{3/2}\,(c+d\,x)^{1/4}}{77\,b^2}+\frac{4\,(a+b\,x)^{3/2}\,(c+d\,x)^{5/4}}{11\,b}-\frac{40\,(b\,c-a\,d)^{13/4}\,\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{231\,b^{9/4}\,d^2\,\sqrt{a+b\,x}}$$

Result (type 5, 143 leaves):

$$\frac{1}{231\,b^2\,d^2\,\sqrt{a+b\,x}}\,4\,(c+d\,x)^{1/4}\left(-d\,(a+b\,x)\,\left(10\,a^2\,d^2-2\,a\,b\,d\,(13\,c+3\,d\,x)-b^2\,\left(5\,c^2+36\,c\,d\,x+21\,d^2\,x^2\right)\right)-10\,(b\,c-a\,d)^3\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)$$

Problem 1643: Result unnecessarily involves higher level functions.

$$\int \frac{(c+d\,x)^{5/4}}{\sqrt{a+b\,x}}\,dx$$

Optimal (type 4, 144 leaves, 5 steps):

$$\frac{20\,(b\,c-a\,d)\,\sqrt{a+b\,x}\,(c+d\,x)^{1/4}}{21\,b^2}+\frac{4\,\sqrt{a+b\,x}\,(c+d\,x)^{5/4}}{7\,b}+\frac{20\,(b\,c-a\,d)^{9/4}\,\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{21\,b^{9/4}\,d\,\sqrt{a+b\,x}}$$

Result (type 5, 111 leaves):

$$\frac{1}{21\,b^2\,d\,\sqrt{a+b\,x}}4\,(c+d\,x)^{1/4}\left(-d\,(a+b\,x)\,(-8\,b\,c+5\,a\,d-3\,b\,d\,x)+5\,(b\,c-a\,d)^2\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)$$

Problem 1644: Result unnecessarily involves higher level functions.

$$\int\frac{(c+d\,x)^{5/4}}{(a+b\,x)^{3/2}}\,dx$$

Optimal (type 4, 132 leaves, 5 steps):

$$\frac{10\,d\,\sqrt{a+b\,x}\,(c+d\,x)^{1/4}}{3\,b^2}-\frac{2\,(c+d\,x)^{5/4}}{b\,\sqrt{a+b\,x}}+\frac{10\,(b\,c-a\,d)^{5/4}\,\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{3\,b^{9/4}\,\sqrt{a+b\,x}}$$

Result (type 5, 95 leaves):

$$-\frac{1}{3\,b^2\,\sqrt{a+b\,x}}2\,(c+d\,x)^{1/4}\left(3\,b\,c-5\,a\,d-2\,b\,d\,x+\frac{5\,d\,(a+b\,x)\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]}{\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}}\right)$$

Problem 1645: Result unnecessarily involves higher level functions.

$$\int\frac{(c+d\,x)^{5/4}}{(a+b\,x)^{5/2}}\,dx$$

Optimal (type 4, 135 leaves, 5 steps):

$$-\frac{5 d (c+d x)^{1/4}}{3 b^2 \sqrt{a+b x}}-\frac{2 (c+d x)^{5/4}}{3 b (a+b x)^{3/2}}+\frac{5 d (b c-a d)^{1/4} \sqrt{-\frac{d (a+b x)}{b c-a d}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4} (c+d x)^{1/4}}{(b c-a d)^{1/4}}\right],-1\right]}{3 b^{9/4} \sqrt{a+b x}}$$

Result (type 5, 95 leaves):

$$\frac{1}{3 b^2 (a+b x)^{3/2}}(c+d x)^{1/4}\left(-2 b c-5 a d-7 b d x+5 d (a+b x) \sqrt{\frac{d (a+b x)}{-b c+a d}}\ \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},\frac{b (c+d x)}{b c-a d}\right]\right)$$

Problem 1646: Result unnecessarily involves higher level functions.

$$\int \frac{(c+d x)^{5/4}}{(a+b x)^{7/2}}\, dx$$

Optimal (type 4, 175 leaves, 6 steps):

$$-\frac{d (c+d x)^{1/4}}{3 b^2 (a+b x)^{3/2}}-\frac{d^2 (c+d x)^{1/4}}{6 b^2 (b c-a d) \sqrt{a+b x}}-\frac{2 (c+d x)^{5/4}}{5 b (a+b x)^{5/2}}-\frac{d^2 \sqrt{-\frac{d (a+b x)}{b c-a d}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4} (c+d x)^{1/4}}{(b c-a d)^{1/4}}\right],-1\right]}{6 b^{9/4} (b c-a d)^{3/4} \sqrt{a+b x}}$$

Result (type 5, 138 leaves):

$$\left((c+d x)^{1/4}\left(-5 a^2 d^2-2 a b d (c+6 d x)+b^2 \left(12 c^2+22 c d x+5 d^2 x^2\right)+5 d^2 (a+b x)^2 \sqrt{\frac{d (a+b x)}{-b c+a d}}\ \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},\frac{b (c+d x)}{b c-a d}\right]\right)\right)\Big/\left(30 b^2 (-b c+a d) (a+b x)^{5/2}\right)$$

Problem 1647: Result unnecessarily involves higher level functions.

$$\int \frac{(c+d x)^{5/4}}{(a+b x)^{9/2}}\, dx$$

Optimal (type 4, 213 leaves, 7 steps):

$$-\frac{d\,(c+d\,x)^{1/4}}{7\,b^2\,(a+b\,x)^{5/2}}-\frac{d^2\,(c+d\,x)^{1/4}}{42\,b^2\,(b\,c-a\,d)\,(a+b\,x)^{3/2}}+\frac{5\,d^3\,(c+d\,x)^{1/4}}{84\,b^2\,(b\,c-a\,d)^2\,\sqrt{a+b\,x}}-\frac{2\,(c+d\,x)^{5/4}}{7\,b\,(a+b\,x)^{7/2}}+\frac{5\,d^3\,\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{84\,b^{9/4}\,(b\,c-a\,d)^{7/4}\,\sqrt{a+b\,x}}$$

Result (type 5, 181 leaves):

$$\left((c+d\,x)^{1/4}\left(-5\,a^3\,d^3-a^2\,b\,d^2\,(2\,c+17\,d\,x)+a\,b^2\,d\,(36\,c^2+68\,c\,d\,x+17\,d^2\,x^2)-b^3\,(24\,c^3+36\,c^2\,d\,x+2\,c\,d^2\,x^2-5\,d^3\,x^3)+5\,d^3\,(a+b\,x)^3\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\;\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\right)\Big/\left(84\,b^2\,(b\,c-a\,d)^2\,(a+b\,x)^{7/2}\right)$$

Problem 1648: Result unnecessarily involves higher level functions.

$$\int\frac{(a+b\,x)^{5/2}}{(c+d\,x)^{1/4}}\,dx$$

Optimal (type 4, 264 leaves, 10 steps):

$$\frac{16\,(b\,c-a\,d)^2\,\sqrt{a+b\,x}\,(c+d\,x)^{3/4}}{39\,d^3}-\frac{40\,(b\,c-a\,d)\,(a+b\,x)^{3/2}\,(c+d\,x)^{3/4}}{117\,d^2}+\frac{4\,(a+b\,x)^{5/2}\,(c+d\,x)^{3/4}}{13\,d}-\frac{32\,(b\,c-a\,d)^{15/4}\,\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{39\,b^{3/4}\,d^4\,\sqrt{a+b\,x}}+\frac{32\,(b\,c-a\,d)^{15/4}\,\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{39\,b^{3/4}\,d^4\,\sqrt{a+b\,x}}$$

Result (type 5, 138 leaves):

$$\frac{1}{117\,d^4\,\sqrt{a+b\,x}}4\,(c+d\,x)^{3/4}\left(d\,(a+b\,x)\,\left(31\,a^2\,d^2+2\,a\,b\,d\,(-17\,c+14\,d\,x)+b^2\,\left(12\,c^2-10\,c\,d\,x+9\,d^2\,x^2\right)\right)-\right.$$
$$\left.8\,(b\,c-a\,d)^3\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\;\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)$$

Problem 1649: Result unnecessarily involves higher level functions.

$$\int\frac{(a+b\,x)^{3/2}}{(c+d\,x)^{1/4}}\,dx$$

Optimal (type 4, 229 leaves, 9 steps):

$$-\frac{8\,(b\,c-a\,d)\,\sqrt{a+b\,x}\,(c+d\,x)^{3/4}}{15\,d^2}+\frac{4\,(a+b\,x)^{3/2}\,(c+d\,x)^{3/4}}{9\,d}+$$
$$\frac{16\,(b\,c-a\,d)^{11/4}\,\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{15\,b^{3/4}\,d^3\,\sqrt{a+b\,x}}-$$
$$\frac{16\,(b\,c-a\,d)^{11/4}\,\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{15\,b^{3/4}\,d^3\,\sqrt{a+b\,x}}$$

Result (type 5, 107 leaves):

$$\frac{1}{45\,d^3\,\sqrt{a+b\,x}}4\,(c+d\,x)^{3/4}\left(d\,(a+b\,x)\,(-6\,b\,c+11\,a\,d+5\,b\,d\,x)+\right.$$
$$\left.4\,(b\,c-a\,d)^2\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\;\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)$$

Problem 1650: Result unnecessarily involves higher level functions.

$$\int\frac{\sqrt{a+b\,x}}{(c+d\,x)^{1/4}}\,dx$$

Optimal (type 4, 196 leaves, 8 steps):

$$\frac{4\sqrt{a+b\,x}\,\left(c+d\,x\right)^{3/4}}{5\,d}-\frac{8\left(b\,c-a\,d\right)^{7/4}\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{5\,b^{3/4}\,d^2\,\sqrt{a+b\,x}}+$$

$$\frac{8\left(b\,c-a\,d\right)^{7/4}\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{5\,b^{3/4}\,d^2\,\sqrt{a+b\,x}}$$

Result (type 5, 77 leaves):

$$\frac{4\sqrt{a+b\,x}\,\left(c+d\,x\right)^{3/4}\left(3+\frac{2\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]}{\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}}\right)}{15\,d}$$

Problem 1651: Result unnecessarily involves higher level functions.

$$\int\frac{1}{\sqrt{a+b\,x}\,\left(c+d\,x\right)^{1/4}}\,dx$$

Optimal (type 4, 167 leaves, 7 steps):

$$\frac{4\left(b\,c-a\,d\right)^{3/4}\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{b^{3/4}\,d\,\sqrt{a+b\,x}}-$$

$$\frac{4\left(b\,c-a\,d\right)^{3/4}\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{b^{3/4}\,d\,\sqrt{a+b\,x}}$$

Result (type 5, 73 leaves):

$$\frac{4\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\,\left(c+d\,x\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]}{3\,d\,\sqrt{a+b\,x}}$$

Problem 1652: Result unnecessarily involves higher level functions.

$$\int\frac{1}{\left(a+b\,x\right)^{3/2}\,\left(c+d\,x\right)^{1/4}}\,dx$$

Optimal (type 4, 191 leaves, 8 steps):

$$-\frac{2\,(c+d\,x)^{3/4}}{(b\,c-a\,d)\,\sqrt{a+b\,x}}+\frac{2\,\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{b^{3/4}\,(b\,c-a\,d)^{1/4}\,\sqrt{a+b\,x}}-$$

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

Result (type 5, 83 leaves):

$$\frac{2\,(c+d\,x)^{3/4}\,\left(-3+\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)}{3\,(b\,c-a\,d)\,\sqrt{a+b\,x}}$$

Problem 1653: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(a+b\,x)^{5/2}\,(c+d\,x)^{1/4}}\,dx$$

Optimal (type 4, 224 leaves, 9 steps):

$$-\frac{2\,(c+d\,x)^{3/4}}{3\,(b\,c-a\,d)\,(a+b\,x)^{3/2}}+\frac{d\,(c+d\,x)^{3/4}}{(b\,c-a\,d)^2\,\sqrt{a+b\,x}}-$$

$$\frac{d\,\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{b^{3/4}\,(b\,c-a\,d)^{5/4}\,\sqrt{a+b\,x}}+$$

$$\frac{d\,\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{b^{3/4}\,(b\,c-a\,d)^{5/4}\,\sqrt{a+b\,x}}$$

Result (type 5, 102 leaves):

$$\left((c+d\,x)^{3/4}\left(-2\,b\,c+5\,a\,d+3\,b\,d\,x-d\,(a+b\,x)\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\right)\Big/$$

$$\left(3\,(b\,c-a\,d)^2\,(a+b\,x)^{3/2}\right)$$

Problem 1654: Result unnecessarily involves higher level functions.

$$\int \frac{(a+b x)^{3/2}}{(c+d x)^{3/4}} \, dx$$

Optimal (type 4, 144 leaves, 5 steps):

$$-\frac{8 (b c-a d) \sqrt{a+b x} (c+d x)^{1/4}}{7 d^2}+\frac{4 (a+b x)^{3/2} (c+d x)^{1/4}}{7 d}+\frac{16 (b c-a d)^{9/4} \sqrt{-\frac{d (a+b x)}{b c-a d}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4} (c+d x)^{1/4}}{(b c-a d)^{1/4}}\right],-1\right]}{7 b^{1/4} d^3 \sqrt{a+b x}}$$

Result (type 5, 106 leaves):

$$\frac{1}{7 d^3 \sqrt{a+b x}} 4 (c+d x)^{1/4} \left(d (a+b x) (-2 b c+3 a d+b d x)+4 (b c-a d)^2 \sqrt{\frac{d (a+b x)}{-b c+a d}} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},\frac{b (c+d x)}{b c-a d}\right]\right)$$

Problem 1655: Result unnecessarily involves higher level functions.

$$\int \frac{\sqrt{a+b x}}{(c+d x)^{3/4}} \, dx$$

Optimal (type 4, 111 leaves, 4 steps):

$$\frac{4 \sqrt{a+b x} (c+d x)^{1/4}}{3 d}-\frac{8 (b c-a d)^{5/4} \sqrt{-\frac{d (a+b x)}{b c-a d}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4} (c+d x)^{1/4}}{(b c-a d)^{1/4}}\right],-1\right]}{3 b^{1/4} d^2 \sqrt{a+b x}}$$

Result (type 5, 77 leaves):

$$\frac{4 \sqrt{a+b x} (c+d x)^{1/4} \left(1+\frac{2 \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},\frac{b (c+d x)}{b c-a d}\right]}{\sqrt{\frac{d (a+b x)}{-b c+a d}}}\right)}{3 d}$$

Problem 1656: Result unnecessarily involves higher level functions.

$$\int \frac{1}{\sqrt{a+b x} (c+d x)^{3/4}} \, dx$$

Optimal (type 4, 83 leaves, 3 steps):

$$\frac{4\,(b\,c-a\,d)^{1/4}\,\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],\,-1\right]}{b^{1/4}\,d\,\sqrt{a+b\,x}}$$

Result (type 5, 71 leaves):

$$\frac{4\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\,\left(c+d\,x\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{1}{2},\,\frac{5}{4},\,\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]}{d\,\sqrt{a+b\,x}}$$

Problem 1657: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a+b\,x)^{3/2}\,(c+d\,x)^{3/4}}\,dx$$

Optimal (type 4, 111 leaves, 4 steps):

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

Result (type 5, 81 leaves):

$$-\frac{2\,(c+d\,x)^{1/4}\,\left(1+\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\ \text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{1}{2},\,\frac{5}{4},\,\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)}{(b\,c-a\,d)\,\sqrt{a+b\,x}}$$

Problem 1658: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a+b\,x)^{5/2}\,(c+d\,x)^{3/4}}\,dx$$

Optimal (type 4, 149 leaves, 5 steps):

$$-\frac{2\,(c+d\,x)^{1/4}}{3\,(b\,c-a\,d)\,(a+b\,x)^{3/2}}+\frac{5\,d\,(c+d\,x)^{1/4}}{3\,(b\,c-a\,d)^2\,\sqrt{a+b\,x}}+$$
$$\frac{5\,d\,\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],\,-1\right]}{3\,b^{1/4}\,(b\,c-a\,d)^{7/4}\,\sqrt{a+b\,x}}$$

Result (type 5, 102 leaves):

$$\left((c+d x)^{1/4}\left(-2 b c+7 a d+5 b d x+5 d (a+b x) \sqrt{\frac{d (a+b x)}{-b c+a d}}\right.\right.$$
$$\left.\left.\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},\frac{b (c+d x)}{b c-a d}\right]\right)\right)\Big/\left(3 (b c-a d)^2 (a+b x)^{3/2}\right)$$

Problem 1659: Result unnecessarily involves higher level functions.

$$\int \frac{(a+b x)^{5/2}}{(c+d x)^{5/4}} \, dx$$

Optimal (type 4, 254 leaves, 10 steps):

$$-\frac{4 (a+b x)^{5/2}}{d (c+d x)^{1/4}}-\frac{16 b (b c-a d) \sqrt{a+b x} (c+d x)^{3/4}}{3 d^3}+\frac{40 b (a+b x)^{3/2} (c+d x)^{3/4}}{9 d^2}+$$
$$\frac{1}{3 d^4 \sqrt{a+b x}} 32 b^{1/4} (b c-a d)^{11/4} \sqrt{-\frac{d (a+b x)}{b c-a d}} \,\text{EllipticE}\left[\text{ArcSin}\left[\frac{b^{1/4} (c+d x)^{1/4}}{(b c-a d)^{1/4}}\right],-1\right]-$$
$$\frac{1}{3 d^4 \sqrt{a+b x}} 32 b^{1/4} (b c-a d)^{11/4} \sqrt{-\frac{d (a+b x)}{b c-a d}} \,\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4} (c+d x)^{1/4}}{(b c-a d)^{1/4}}\right],-1\right]$$

Result (type 5, 131 leaves):

$$\frac{1}{9 d^4 \sqrt{a+b x}} 4 (c+d x)^{3/4}\left(d (a+b x)\left(b (-3 b c+4 a d)+b^2 d x-\frac{9 (b c-a d)^2}{c+d x}\right)+\right.$$
$$\left.8 b (b c-a d)^2 \sqrt{\frac{d (a+b x)}{-b c+a d}} \,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},\frac{b (c+d x)}{b c-a d}\right]\right)$$

Problem 1660: Result unnecessarily involves higher level functions.

$$\int \frac{(a+b x)^{3/2}}{(c+d x)^{5/4}} \, dx$$

Optimal (type 4, 220 leaves, 9 steps):

$$-\frac{4\,(a+b\,x)^{3/2}}{d\,(c+d\,x)^{1/4}}+\frac{24\,b\,\sqrt{a+b\,x}\,(c+d\,x)^{3/4}}{5\,d^2}-\frac{1}{5\,d^3\,\sqrt{a+b\,x}}$$

$$48\,b^{1/4}\,(b\,c-a\,d)^{7/4}\,\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]+$$

$$\frac{1}{5\,d^3\,\sqrt{a+b\,x}}48\,b^{1/4}\,(b\,c-a\,d)^{7/4}\,\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]$$

Result (type 5, 98 leaves):

$$\frac{4\,\sqrt{a+b\,x}\,(c+d\,x)^{3/4}\left(\frac{6\,b\,c-5\,a\,d+b\,d\,x}{c+d\,x}+\frac{4\,b\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]}{\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}}\right)}{5\,d^2}$$

Problem 1661: Result unnecessarily involves higher level functions.

$$\int\frac{\sqrt{a+b\,x}}{(c+d\,x)^{5/4}}\,dx$$

Optimal (type 4, 190 leaves, 8 steps):

$$-\frac{4\,\sqrt{a+b\,x}}{d\,(c+d\,x)^{1/4}}+\frac{8\,b^{1/4}\,(b\,c-a\,d)^{3/4}\,\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{d^2\,\sqrt{a+b\,x}}-$$

$$\frac{8\,b^{1/4}\,(b\,c-a\,d)^{3/4}\,\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{d^2\,\sqrt{a+b\,x}}$$

Result (type 5, 90 leaves):

$$\left(-12\,d\,(a+b\,x)+8\,b\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\,(c+d\,x)\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\Big/$$

$$\left(3\,d^2\,\sqrt{a+b\,x}\,(c+d\,x)^{1/4}\right)$$

Problem 1662: Result unnecessarily involves higher level functions.

$$\int\frac{1}{\sqrt{a+b\,x}\,(c+d\,x)^{5/4}}\,dx$$

Optimal (type 4, 197 leaves, 8 steps):

$$\frac{4\sqrt{a+bx}}{(bc-ad)\,(c+dx)^{1/4}}-\frac{4\,b^{1/4}\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{d\,(b\,c-a\,d)^{1/4}\sqrt{a+b\,x}}+$$

$$\frac{4\,b^{1/4}\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{d\,(b\,c-a\,d)^{1/4}\sqrt{a+b\,x}}$$

Result (type 5, 100 leaves):

$$\left(12\,d\,(a+b\,x)-4\,b\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\ (c+d\,x)\ \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\Big/$$
$$\left(3\,d\,(b\,c-a\,d)\sqrt{a+b\,x}\ (c+d\,x)^{1/4}\right)$$

Problem 1663: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(a+b\,x)^{3/2}\,(c+d\,x)^{5/4}}\,dx$$

Optimal (type 4, 222 leaves, 9 steps):

$$-\frac{2}{(b\,c-a\,d)\sqrt{a+b\,x}\ (c+d\,x)^{1/4}}-\frac{6\,d\sqrt{a+b\,x}}{(b\,c-a\,d)^{2}\,(c+d\,x)^{1/4}}+$$

$$\frac{6\,b^{1/4}\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{(b\,c-a\,d)^{5/4}\sqrt{a+b\,x}}-$$

$$\frac{6\,b^{1/4}\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{(b\,c-a\,d)^{5/4}\sqrt{a+b\,x}}$$

Result (type 5, 99 leaves):

$$\left(-4\,a\,d-2\,b\,(c+3\,d\,x)+2\,b\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\ (c+d\,x)\ \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\Big/$$
$$\left((b\,c-a\,d)^{2}\sqrt{a+b\,x}\ (c+d\,x)^{1/4}\right)$$

Problem 1664: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(a+b\,x)^{5/2}\,(c+d\,x)^{5/4}}\,dx$$

Optimal (type 4, 261 leaves, 10 steps):

$$-\frac{2}{3\,(b\,c-a\,d)\,(a+b\,x)^{3/2}\,(c+d\,x)^{1/4}}+\frac{7\,d}{3\,(b\,c-a\,d)^2\,\sqrt{a+b\,x}\,(c+d\,x)^{1/4}}+$$
$$\frac{7\,d^2\,\sqrt{a+b\,x}}{(b\,c-a\,d)^3\,(c+d\,x)^{1/4}}-\frac{7\,b^{1/4}\,d\,\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{(b\,c-a\,d)^{9/4}\,\sqrt{a+b\,x}}+$$
$$\frac{7\,b^{1/4}\,d\,\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{(b\,c-a\,d)^{9/4}\,\sqrt{a+b\,x}}$$

Result (type 5, 139 leaves):

$$\left(-12\,a^2\,d^2-a\,b\,d\,(11\,c+35\,d\,x)+b^2\,(2\,c^2-7\,c\,d\,x-21\,d^2\,x^2)+\right.$$
$$\left.7\,b\,d\,(a+b\,x)\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\,(c+d\,x)\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\Big/$$
$$\left(3\,(-b\,c+a\,d)^3\,(a+b\,x)^{3/2}\,(c+d\,x)^{1/4}\right)$$

Problem 1665: Result unnecessarily involves higher level functions.

$$\int\frac{(a+b\,x)^{7/2}}{(c+d\,x)^{7/4}}\,dx$$

Optimal (type 4, 207 leaves, 7 steps):

$$-\frac{4\,(a+b\,x)^{7/2}}{3\,d\,(c+d\,x)^{3/4}}+\frac{160\,b\,(b\,c-a\,d)^2\,\sqrt{a+b\,x}\,(c+d\,x)^{1/4}}{33\,d^4}-$$
$$\frac{80\,b\,(b\,c-a\,d)\,(a+b\,x)^{3/2}\,(c+d\,x)^{1/4}}{33\,d^3}+\frac{56\,b\,(a+b\,x)^{5/2}\,(c+d\,x)^{1/4}}{33\,d^2}-\frac{1}{33\,d^5\,\sqrt{a+b\,x}}$$
$$320\,b^{3/4}\,(b\,c-a\,d)^{13/4}\,\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]$$

Result (type 5, 181 leaves):

$$\frac{1}{33\,d^5\,\sqrt{a+b\,x}}$$

$$4\,(c+d\,x)^{1/4}\left(\frac{1}{c+d\,x}d\,(a+b\,x)\,\left(11\,(b\,c-a\,d)^3+b\,\left(29\,b^2\,c^2-67\,a\,b\,c\,d+41\,a^2\,d^2\right)\,(c+d\,x)-3\,b^2\,d\,(3\,b\,c-5\,a\,d)\,x\,(c+d\,x)+3\,b^3\,d^2\,x^2\,(c+d\,x)\right)-80\,b\,(b\,c-a\,d)^3\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)$$

Problem 1666: Result unnecessarily involves higher level functions.

$$\int\frac{(a+b\,x)^{3/2}}{(c+d\,x)^{7/4}}\,dx$$

Optimal (type 4, 137 leaves, 5 steps):

$$-\frac{4\,(a+b\,x)^{3/2}}{3\,d\,(c+d\,x)^{3/4}}+\frac{8\,b\,\sqrt{a+b\,x}\,(c+d\,x)^{1/4}}{3\,d^2}-\frac{1}{3\,d^3\,\sqrt{a+b\,x}}16\,b^{3/4}\,(b\,c-a\,d)^{5/4}\,\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]$$

Result (type 5, 98 leaves):

$$\frac{4\,\sqrt{a+b\,x}\,(c+d\,x)^{1/4}\left(\frac{2\,b\,c-a\,d+b\,d\,x}{c+d\,x}+\frac{4\,b\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]}{\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}}\right)}{3\,d^2}$$

Problem 1667: Result unnecessarily involves higher level functions.

$$\int\frac{\sqrt{a+b\,x}}{(c+d\,x)^{7/4}}\,dx$$

Optimal (type 4, 111 leaves, 4 steps):

$$-\frac{4\,\sqrt{a+b\,x}}{3\,d\,(c+d\,x)^{3/4}}+\frac{8\,b^{3/4}\,(b\,c-a\,d)^{1/4}\,\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{3\,d^2\,\sqrt{a+b\,x}}$$

Result (type 5, 90 leaves):

$$\left(-4\,d\,(a+b\,x)+8\,b\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\,(c+d\,x)\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\Big/\left(3\,d^2\,\sqrt{a+b\,x}\,(c+d\,x)^{3/4}\right)$$

Problem 1668: Result unnecessarily involves higher level functions.

$$\int\frac{1}{\sqrt{a+b\,x}\,(c+d\,x)^{7/4}}\,dx$$

Optimal (type 4, 118 leaves, 4 steps):

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

Result (type 5, 98 leaves):

$$\left(4\left(d\,(a+b\,x)+b\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\,(c+d\,x)\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\right)\Big/\left(3\,d\,(b\,c-a\,d)\,\sqrt{a+b\,x}\,(c+d\,x)^{3/4}\right)$$

Problem 1669: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(a+b\,x)^{3/2}\,(c+d\,x)^{7/4}}\,dx$$

Optimal (type 4, 146 leaves, 5 steps):

$$-\frac{2}{(b\,c-a\,d)\,\sqrt{a+b\,x}\,(c+d\,x)^{3/4}}-\frac{10\,d\,\sqrt{a+b\,x}}{3\,(b\,c-a\,d)^2\,(c+d\,x)^{3/4}}-\frac{10\,b^{3/4}\,\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{3\,(b\,c-a\,d)^{7/4}\,\sqrt{a+b\,x}}$$

Result (type 5, 102 leaves):

$$-\left(\left(2\left(3\,b\,c+2\,a\,d+5\,b\,d\,x+5\,b\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\,(c+d\,x)\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\right)\Big/\left(3\,(b\,c-a\,d)^2\,\sqrt{a+b\,x}\,(c+d\,x)^{3/4}\right)\right)$$

Problem 1670: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a+b x)^{5/2}\,(c+d x)^{7/4}}\,dx$$

Optimal (type 4, 178 leaves, 6 steps):

$$-\frac{2}{3\,(b c-a d)\,(a+b x)^{3/2}\,(c+d x)^{3/4}}+\frac{3 d}{(b c-a d)^2\,\sqrt{a+b x}\,(c+d x)^{3/4}}+\frac{5 d^2\,\sqrt{a+b x}}{(b c-a d)^3\,(c+d x)^{3/4}}+\frac{5 b^{3/4} d\,\sqrt{-\frac{d (a+b x)}{b c-a d}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4} (c+d x)^{1/4}}{(b c-a d)^{1/4}}\right],-1\right]}{(b c-a d)^{11/4}\,\sqrt{a+b x}}$$

Result (type 5, 139 leaves):

$$\left(-4 a^2 d^2-a b d\,(13 c+21 d x)+b^2\,(2 c^2-9 c d x-15 d^2 x^2)-15 b d\,(a+b x)\,\sqrt{\frac{d\,(a+b x)}{-b c+a d}}\,(c+d x)\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},\frac{b\,(c+d x)}{b c-a d}\right]\right)\Big/\left(3\,(-b c+a d)^3\,(a+b x)^{3/2}\,(c+d x)^{3/4}\right)$$

Problem 1671: Result unnecessarily involves higher level functions.

$$\int \frac{(a+b x)^{7/2}}{(c+d x)^{9/4}}\,dx$$

Optimal (type 4, 286 leaves, 11 steps):

$$-\frac{4\,(a+b x)^{7/2}}{5 d\,(c+d x)^{5/4}}-\frac{56 b\,(a+b x)^{5/2}}{5 d^2\,(c+d x)^{1/4}}-\frac{224 b^2\,(b c-a d)\,\sqrt{a+b x}\,(c+d x)^{3/4}}{15 d^4}+\frac{112 b^2\,(a+b x)^{3/2}\,(c+d x)^{3/4}}{9 d^3}+\frac{1}{15 d^5\,\sqrt{a+b x}}448 b^{5/4}\,(b c-a d)^{11/4}\,\sqrt{-\frac{d\,(a+b x)}{b c-a d}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d x)^{1/4}}{(b c-a d)^{1/4}}\right],-1\right]-\frac{1}{15 d^5\,\sqrt{a+b x}}448 b^{5/4}\,(b c-a d)^{11/4}\,\sqrt{-\frac{d\,(a+b x)}{b c-a d}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d x)^{1/4}}{(b c-a d)^{1/4}}\right],-1\right]$$

Result (type 5, 169 leaves):

$$\frac{1}{45\,d^5\,\sqrt{a+b\,x}}4\,(c+d\,x)^{3/4}\left(\frac{1}{(c+d\,x)^2}d\,(a+b\,x)\left(9\,(b\,c-a\,d)^3-153\,b\,(b\,c-a\,d)^2\,(c+d\,x)-b^2\,(24\,b\,c-29\,a\,d)\,(c+d\,x)^2+5\,b^3\,d\,x\,(c+d\,x)^2\right)+112\,b^2\,(b\,c-a\,d)^2\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)$$

Problem 1672: Result unnecessarily involves higher level functions.

$$\int\frac{(a+b\,x)^{5/2}}{(c+d\,x)^{9/4}}\,dx$$

Optimal (type 4, 248 leaves, 10 steps):

$$-\frac{4\,(a+b\,x)^{5/2}}{5\,d\,(c+d\,x)^{5/4}}-\frac{8\,b\,(a+b\,x)^{3/2}}{d^2\,(c+d\,x)^{1/4}}+\frac{48\,b^2\,\sqrt{a+b\,x}\,(c+d\,x)^{3/4}}{5\,d^3}-\frac{1}{5\,d^4\,\sqrt{a+b\,x}}96\,b^{5/4}\,(b\,c-a\,d)^{7/4}\,\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]+\frac{1}{5\,d^4\,\sqrt{a+b\,x}}96\,b^{5/4}\,(b\,c-a\,d)^{7/4}\,\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]$$

Result (type 5, 141 leaves):

$$\frac{1}{5\,d^4\,\sqrt{a+b\,x}}4\,(c+d\,x)^{3/4}\left(-\frac{d\,(a+b\,x)\,\left((b\,c-a\,d)^2-12\,b\,(b\,c-a\,d)\,(c+d\,x)-b^2\,(c+d\,x)^2\right)}{(c+d\,x)^2}-8\,b^2\,(b\,c-a\,d)\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)$$

Problem 1673: Result unnecessarily involves higher level functions.

$$\int\frac{(a+b\,x)^{3/2}}{(c+d\,x)^{9/4}}\,dx$$

Optimal (type 4, 222 leaves, 9 steps):

$$-\frac{4\,(a+b\,x)^{3/2}}{5\,d\,(c+d\,x)^{5/4}}-\frac{24\,b\,\sqrt{a+b\,x}}{5\,d^2\,(c+d\,x)^{1/4}}+\frac{1}{5\,d^3\,\sqrt{a+b\,x}}48\,b^{5/4}\,(b\,c-a\,d)^{3/4}\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]-\frac{1}{5\,d^3\,\sqrt{a+b\,x}}48\,b^{5/4}\,(b\,c-a\,d)^{3/4}\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]$$

Result (type 5, 107 leaves):

$$\left(-4\,d\,(a+b\,x)\,(6\,b\,c+a\,d+7\,b\,d\,x)+16\,b^2\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\,(c+d\,x)^2\;\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\Big/\left(5\,d^3\,\sqrt{a+b\,x}\,(c+d\,x)^{5/4}\right)$$

Problem 1674: Result unnecessarily involves higher level functions.

$$\int\frac{\sqrt{a+b\,x}}{(c+d\,x)^{9/4}}\,dx$$

Optimal (type 4, 232 leaves, 9 steps):

$$-\frac{4\,\sqrt{a+b\,x}}{5\,d\,(c+d\,x)^{5/4}}+\frac{8\,b\,\sqrt{a+b\,x}}{5\,d\,(b\,c-a\,d)\,(c+d\,x)^{1/4}}-\frac{8\,b^{5/4}\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{5\,d^2\,(b\,c-a\,d)^{1/4}\,\sqrt{a+b\,x}}+\frac{8\,b^{5/4}\sqrt{-\frac{d\,(a+b\,x)}{b\,c-a\,d}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4}\,(c+d\,x)^{1/4}}{(b\,c-a\,d)^{1/4}}\right],-1\right]}{5\,d^2\,(b\,c-a\,d)^{1/4}\,\sqrt{a+b\,x}}$$

Result (type 5, 116 leaves):

$$\left(-12\,d\,(a+b\,x)\,(a\,d+b\,(c+2\,d\,x))+8\,b^2\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\,(c+d\,x)^2\;\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\Big/\left(15\,d^2\,(-b\,c+a\,d)\,\sqrt{a+b\,x}\,(c+d\,x)^{5/4}\right)$$

Problem 1675: Result unnecessarily involves higher level functions.

$$\int \frac{1}{\sqrt{a+b x}\, (c+d x)^{9/4}}\, dx$$

Optimal (type 4, 236 leaves, 9 steps):

$$\frac{4\sqrt{a+b x}}{5 (b c-a d) (c+d x)^{5/4}}+\frac{12 b \sqrt{a+b x}}{5 (b c-a d)^2 (c+d x)^{1/4}}-\frac{12 b^{5/4} \sqrt{-\frac{d (a+b x)}{b c-a d}}\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{b^{1/4} (c+d x)^{1/4}}{(b c-a d)^{1/4}}\right],-1\right]}{5 d (b c-a d)^{5/4} \sqrt{a+b x}}+\frac{12 b^{5/4} \sqrt{-\frac{d (a+b x)}{b c-a d}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4} (c+d x)^{1/4}}{(b c-a d)^{1/4}}\right],-1\right]}{5 d (b c-a d)^{5/4} \sqrt{a+b x}}$$

Result (type 5, 115 leaves):

$$-\left(\left(4 \left(d (a+b x) (-4 b c+a d-3 b d x)+b^2 \sqrt{\frac{d (a+b x)}{-b c+a d}}\, (c+d x)^2\, \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},\frac{b (c+d x)}{b c-a d}\right]\right)\right)\Big/\left(5 d (b c-a d)^2 \sqrt{a+b x}\, (c+d x)^{5/4}\right)\right)$$

Problem 1676: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a+b x)^{3/2} (c+d x)^{9/4}}\, dx$$

Optimal (type 4, 262 leaves, 10 steps):

$$-\frac{2}{(b c-a d) \sqrt{a+b x}\, (c+d x)^{5/4}}-\frac{14 d \sqrt{a+b x}}{5 (b c-a d)^2 (c+d x)^{5/4}}-\frac{42 b d \sqrt{a+b x}}{5 (b c-a d)^3 (c+d x)^{1/4}}+\frac{42 b^{5/4} \sqrt{-\frac{d (a+b x)}{b c-a d}}\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{b^{1/4} (c+d x)^{1/4}}{(b c-a d)^{1/4}}\right],-1\right]}{5 (b c-a d)^{9/4} \sqrt{a+b x}}-\frac{42 b^{5/4} \sqrt{-\frac{d (a+b x)}{b c-a d}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4} (c+d x)^{1/4}}{(b c-a d)^{1/4}}\right],-1\right]}{5 (b c-a d)^{9/4} \sqrt{a+b x}}$$

Result (type 5, 138 leaves):

$$\left(-4 a^2 d^2+4 a b d \left(9 c+7 d x\right)+2 b^2 \left(5 c^2+28 c d x+21 d^2 x^2\right)-14 b^2 \sqrt{\frac{d \left(a+b x\right)}{-b c+a d}} \left(c+d x\right)^2 \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},\frac{b \left(c+d x\right)}{b c-a d}\right]\right)\Big/ \left(5 \left(-b c+a d\right)^3 \sqrt{a+b x} \left(c+d x\right)^{5/4}\right)$$

Problem 1677: Result unnecessarily involves higher level functions.

$$\int \frac{1}{\left(a+b x\right)^{5/2} \left(c+d x\right)^{9/4}} \, dx$$

Optimal (type 4, 303 leaves, 11 steps):

$$-\frac{2}{3 \left(b c-a d\right) \left(a+b x\right)^{3/2} \left(c+d x\right)^{5/4}}+\frac{11 d}{3 \left(b c-a d\right)^2 \sqrt{a+b x} \left(c+d x\right)^{5/4}}+\frac{77 d^2 \sqrt{a+b x}}{15 \left(b c-a d\right)^3 \left(c+d x\right)^{5/4}}+\frac{77 b d^2 \sqrt{a+b x}}{5 \left(b c-a d\right)^4 \left(c+d x\right)^{1/4}}-\frac{77 b^{5/4} d \sqrt{-\frac{d (a+b x)}{b c-a d}} \text{EllipticE}\left[\text{ArcSin}\left[\frac{b^{1/4} (c+d x)^{1/4}}{(b c-a d)^{1/4}}\right],-1\right]}{5 \left(b c-a d\right)^{13/4} \sqrt{a+b x}}+\frac{77 b^{5/4} d \sqrt{-\frac{d (a+b x)}{b c-a d}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{b^{1/4} (c+d x)^{1/4}}{(b c-a d)^{1/4}}\right],-1\right]}{5 \left(b c-a d\right)^{13/4} \sqrt{a+b x}}$$

Result (type 5, 156 leaves):

$$\left(\left(c+d x\right)^{3/4} \left(75 b^2 d-\frac{10 b^2 \left(b c-a d\right)}{a+b x}+\frac{12 d^2 \left(b c-a d\right) \left(a+b x\right)}{\left(c+d x\right)^2}+\frac{156 b d^2 \left(a+b x\right)}{c+d x}-77 b^2 d \sqrt{\frac{d \left(a+b x\right)}{-b c+a d}} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},\frac{b \left(c+d x\right)}{b c-a d}\right]\right)\right)\Big/ \left(15 \left(b c-a d\right)^4 \sqrt{a+b x}\right)$$

Problem 1678: Result unnecessarily involves higher level functions.

$$\int \left(a+b x\right)^{3/4} \left(c+d x\right)^{5/4} \, dx$$

Optimal (type 3, 205 leaves, 8 steps):

$$\frac{5 (b c-a d)^2 (a+b x)^{3/4} (c+d x)^{1/4}}{96 b^2 d}+\frac{5 (b c-a d) (a+b x)^{7/4} (c+d x)^{1/4}}{24 b^2}+\frac{(a+b x)^{7/4} (c+d x)^{5/4}}{3 b}+\frac{5 (b c-a d)^3 \text{ArcTan}\left[\frac{d^{1/4} (a+b x)^{1/4}}{b^{1/4} (c+d x)^{1/4}}\right]}{64 b^{9/4} d^{7/4}}-\frac{5 (b c-a d)^3 \text{ArcTanh}\left[\frac{d^{1/4} (a+b x)^{1/4}}{b^{1/4} (c+d x)^{1/4}}\right]}{64 b^{9/4} d^{7/4}}$$

Result (type 5, 143 leaves):

$$\left((c+d x)^{1/4} \left(-d (a+b x) \left(15 a^2 d^2-6 a b d (7 c+2 d x)-b^2 \left(5 c^2+52 c d x+32 d^2 x^2\right)\right)-15 (b c-a d)^3 \left(\frac{d (a+b x)}{-b c+a d}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},\frac{b (c+d x)}{b c-a d}\right]\right)\right)\Big/\left(96 b^2 d^2 (a+b x)^{1/4}\right)$$

Problem 1679: Result unnecessarily involves higher level functions.

$$\int \frac{(c+d x)^{5/4}}{(a+b x)^{1/4}} \, dx$$

Optimal (type 3, 167 leaves, 7 steps):

$$\frac{5 (b c-a d) (a+b x)^{3/4} (c+d x)^{1/4}}{8 b^2}+\frac{(a+b x)^{3/4} (c+d x)^{5/4}}{2 b}-\frac{5 (b c-a d)^2 \text{ArcTan}\left[\frac{d^{1/4} (a+b x)^{1/4}}{b^{1/4} (c+d x)^{1/4}}\right]}{16 b^{9/4} d^{3/4}}+\frac{5 (b c-a d)^2 \text{ArcTanh}\left[\frac{d^{1/4} (a+b x)^{1/4}}{b^{1/4} (c+d x)^{1/4}}\right]}{16 b^{9/4} d^{3/4}}$$

Result (type 5, 111 leaves):

$$\frac{1}{8 b^2 d (a+b x)^{1/4}} (c+d x)^{1/4} \left(-d (a+b x) (-9 b c+5 a d-4 b d x)+5 (b c-a d)^2 \left(\frac{d (a+b x)}{-b c+a d}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},\frac{b (c+d x)}{b c-a d}\right]\right)$$

Problem 1680: Result unnecessarily involves higher level functions.

$$\int \frac{(c+d x)^{5/4}}{(a+b x)^{5/4}} \, dx$$

Optimal (type 3, 152 leaves, 7 steps):

$$\frac{5 d (a+b x)^{3/4} (c+d x)^{1/4}}{b^2}-\frac{4 (c+d x)^{5/4}}{b (a+b x)^{1/4}}-\frac{5 d^{1/4} (b c-a d) \text{ArcTan}\left[\frac{d^{1/4} (a+b x)^{1/4}}{b^{1/4} (c+d x)^{1/4}}\right]}{2 b^{9/4}}+\frac{5 d^{1/4} (b c-a d) \text{ArcTanh}\left[\frac{d^{1/4} (a+b x)^{1/4}}{b^{1/4} (c+d x)^{1/4}}\right]}{2 b^{9/4}}$$

Result (type 5, 93 leaves):

$$\frac{1}{b^2\,(a+b\,x)^{1/4}}(c+d\,x)^{1/4}\left(-4\,b\,c+5\,a\,d+b\,d\,x+5\,(b\,c-a\,d)\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)$$

Problem 1681: Result unnecessarily involves higher level functions.

$$\int\frac{(c+d\,x)^{5/4}}{(a+b\,x)^{9/4}}\,dx$$

Optimal (type 3, 134 leaves, 7 steps):

$$-\frac{4\,d\,(c+d\,x)^{1/4}}{b^2\,(a+b\,x)^{1/4}}-\frac{4\,(c+d\,x)^{5/4}}{5\,b\,(a+b\,x)^{5/4}}-\frac{2\,d^{5/4}\,\text{ArcTan}\left[\frac{d^{1/4}\,(a+b\,x)^{1/4}}{b^{1/4}\,(c+d\,x)^{1/4}}\right]}{b^{9/4}}+\frac{2\,d^{5/4}\,\text{ArcTanh}\left[\frac{d^{1/4}\,(a+b\,x)^{1/4}}{b^{1/4}\,(c+d\,x)^{1/4}}\right]}{b^{9/4}}$$

Result (type 5, 94 leaves):

$$-\frac{1}{5\,b^2\,(a+b\,x)^{5/4}}4\,(c+d\,x)^{1/4}\left(5\,a\,d+b\,(c+6\,d\,x)-5\,d\,(a+b\,x)\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)$$

Problem 1686: Result unnecessarily involves higher level functions.

$$\int(a+b\,x)^{5/4}\,(c+d\,x)^{5/4}\,dx$$

Optimal (type 4, 408 leaves, 7 steps):

$$-\frac{5\,(b\,c-a\,d)^3\,(a+b\,x)^{1/4}\,(c+d\,x)^{1/4}}{84\,b^2\,d^2}+\frac{(b\,c-a\,d)^2\,(a+b\,x)^{5/4}\,(c+d\,x)^{1/4}}{42\,b^2\,d}+\frac{(b\,c-a\,d)\,(a+b\,x)^{9/4}\,(c+d\,x)^{1/4}}{7\,b^2}+\frac{2\,(a+b\,x)^{9/4}\,(c+d\,x)^{5/4}}{7\,b}+$$

$$\left(5\,(b\,c-a\,d)^{9/2}\,\left((a+b\,x)\,(c+d\,x)\right)^{3/4}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\right.$$

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

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

$$\left(168\,\sqrt{2}\,b^{9/4}\,d^{9/4}\,(a+b\,x)^{3/4}\,(c+d\,x)^{3/4}\,(b\,c+a\,d+2\,b\,d\,x)\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)$$

Result (type 5, 183 leaves):

$$\left((c+d\,x)^{1/4}\left(-d\,(a+b\,x)\,\left(5\,a^3\,d^3-a^2\,b\,d^2\,(17\,c+2\,d\,x)-a\,b^2\,d\,(17\,c^2+68\,c\,d\,x+36\,d^2\,x^2)+\right.\right.\right.$$

$$\left.b^3\,(5\,c^3-2\,c^2\,d\,x-36\,c\,d^2\,x^2-24\,d^3\,x^3)\right)+5\,(b\,c-a\,d)^4\,\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{3/4}$$

$$\left.\left.\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\right)\Big/\left(84\,b^2\,d^3\,(a+b\,x)^{3/4}\right)$$

Problem 1687: Result unnecessarily involves higher level functions.

$$\int(a+b\,x)^{1/4}\,(c+d\,x)^{5/4}\,dx$$

Optimal (type 4, 370 leaves, 6 steps):

$$\frac{(b c-a d)^2 (a+b x)^{1/4} (c+d x)^{1/4}}{6 b^2 d}+\frac{(b c-a d) (a+b x)^{5/4} (c+d x)^{1/4}}{3 b^2}+$$

$$\frac{2 (a+b x)^{5/4} (c+d x)^{5/4}}{5 b}-\left((b c-a d)^{7/2} \left((a+b x) (c+d x)\right)^{3/4} \sqrt{(b c+a d+2 b d x)^2}\right.$$

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

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

$$\left(12 \sqrt{2} b^{9/4} d^{5/4} (a+b x)^{3/4} (c+d x)^{3/4} (b c+a d+2 b d x) \sqrt{(a d+b (c+2 d x))^2}\right)$$

Result (type 5, 142 leaves) :

$$\left((c+d x)^{1/4} \left(-d (a+b x) \left(5 a^2 d^2-2 a b d (6 c+d x)-b^2 \left(5 c^2+22 c d x+12 d^2 x^2\right)\right)-5 (b c-a d)^3\right.\right.$$

$$\left.\left.\left(\frac{d (a+b x)}{-b c+a d}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{3}{4}, \frac{5}{4}, \frac{b (c+d x)}{b c-a d}\right]\right)\right) \Big/ \left(30 b^2 d^2 (a+b x)^{3/4}\right)$$

Problem 1688: Result unnecessarily involves higher level functions.

$$\int \frac{(c+d x)^{5/4}}{(a+b x)^{3/4}} \, dx$$

Optimal (type 4, 332 leaves, 5 steps) :

$$\frac{5\,(b\,c-a\,d)\,(a+b\,x)^{1/4}\,(c+d\,x)^{1/4}}{3\,b^2}+\frac{2\,(a+b\,x)^{1/4}\,(c+d\,x)^{5/4}}{3\,b}+$$

$$\left(5\,(b\,c-a\,d)^{5/2}\,\left((a+b\,x)\,(c+d\,x)\right)^{3/4}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\right.$$

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

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

$$\left(6\,\sqrt{2}\,b^{9/4}\,d^{1/4}\,(a+b\,x)^{3/4}\,(c+d\,x)^{3/4}\,(b\,c+a\,d+2\,b\,d\,x)\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)$$

Result (type 5, 111 leaves):

$$\frac{1}{3\,b^2\,d\,(a+b\,x)^{3/4}}\,(c+d\,x)^{1/4}\,\left(-d\,(a+b\,x)\,(-7\,b\,c+5\,a\,d-2\,b\,d\,x)+\right.$$

$$\left.5\,(b\,c-a\,d)^2\,\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{3}{4},\,\frac{5}{4},\,\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)$$

Problem 1689: Result unnecessarily involves higher level functions.

$$\int\frac{(c+d\,x)^{5/4}}{(a+b\,x)^{7/4}}\,dx$$

Optimal (type 4, 325 leaves, 5 steps):

$$\frac{10\,d\,(a+b\,x)^{1/4}\,(c+d\,x)^{1/4}}{3\,b^2}-\frac{4\,(c+d\,x)^{5/4}}{3\,b\,(a+b\,x)^{3/4}}+$$
$$\left(5\,d^{3/4}\,(b\,c-a\,d)^{3/2}\,\left((a+b\,x)\,(c+d\,x)\right)^{3/4}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\right.$$
$$\left(1+\frac{2\,\sqrt{b}\,\sqrt{d}\,\sqrt{(a+b\,x)\,(c+d\,x)}}{b\,c-a\,d}\right)\sqrt{\frac{(a\,d+b\,(c+2\,d\,x))^2}{(b\,c-a\,d)^2\left(1+\frac{2\,\sqrt{b}\,\sqrt{d}\,\sqrt{(a+b\,x)\,(c+d\,x)}}{b\,c-a\,d}\right)^2}}$$
$$\left.\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,b^{1/4}\,d^{1/4}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/4}}{\sqrt{b\,c-a\,d}}\right],\frac{1}{2}\right]\right)\Big/$$
$$\left(3\,\sqrt{2}\,b^{9/4}\,(a+b\,x)^{3/4}\,(c+d\,x)^{3/4}\,(b\,c+a\,d+2\,b\,d\,x)\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)$$

Result (type 5, 95 leaves) :

$$-\frac{1}{3\,b^2\,(a+b\,x)^{3/4}}$$
$$2\,(c+d\,x)^{1/4}\left(2\,b\,c-5\,a\,d-3\,b\,d\,x+\frac{5\,d\,(a+b\,x)\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]}{\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{1/4}}\right)$$

Problem 1690: Result unnecessarily involves higher level functions.

$$\int\frac{(c+d\,x)^{5/4}}{(a+b\,x)^{11/4}}\,dx$$

Optimal (type 4, 325 leaves, 5 steps) :

$$-\frac{20\, d\, (c+d\, x)^{1/4}}{21\, b^2\, (a+b\, x)^{3/4}}-\frac{4\, (c+d\, x)^{5/4}}{7\, b\, (a+b\, x)^{7/4}}+\left(5\sqrt{2}\, d^{7/4}\sqrt{b\, c-a\, d}\, \left((a+b\, x)\, (c+d\, x)\right)^{3/4}\sqrt{(b\, c+a\, d+2\, b\, d\, x)^2}\left(1+\frac{2\sqrt{b}\, \sqrt{d}\, \sqrt{(a+b\, x)\, (c+d\, x)}}{b\, c-a\, d}\right)\sqrt{\frac{(a\, d+b\, (c+2\, d\, x))^2}{(b\, c-a\, d)^2\left(1+\frac{2\sqrt{b}\, \sqrt{d}\, \sqrt{(a+b\, x)\, (c+d\, x)}}{b\, c-a\, d}\right)^2}}\ \text{EllipticF}\left[2\, \text{ArcTan}\left[\frac{\sqrt{2}\, b^{1/4}\, d^{1/4}\left((a+b\, x)\, (c+d\, x)\right)^{1/4}}{\sqrt{b\, c-a\, d}}\right],\frac{1}{2}\right]\right)\Big/\left(21\, b^{9/4}\, (a+b\, x)^{3/4}\, (c+d\, x)^{3/4}\, (b\, c+a\, d+2\, b\, d\, x)\sqrt{(a\, d+b\, (c+2\, d\, x))^2}\right)$$

Result (type 5, 95 leaves):

$$-\frac{1}{21\, b^2\, (a+b\, x)^{7/4}}4\, (c+d\, x)^{1/4}\left(3\, b\, c+5\, a\, d+8\, b\, d\, x-5\, d\, (a+b\, x)\left(\frac{d\, (a+b\, x)}{-b\, c+a\, d}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{b\, (c+d\, x)}{b\, c-a\, d}\right]\right)$$

Problem 1691: Result unnecessarily involves higher level functions.

$$\int\frac{(c+d\, x)^{5/4}}{(a+b\, x)^{15/4}}\, dx$$

Optimal (type 4, 363 leaves, 6 steps):

$$-\frac{20\,d\,(c+d\,x)^{1/4}}{77\,b^2\,(a+b\,x)^{7/4}}-\frac{20\,d^2\,(c+d\,x)^{1/4}}{231\,b^2\,(b\,c-a\,d)\,(a+b\,x)^{3/4}}-\frac{4\,(c+d\,x)^{5/4}}{11\,b\,(a+b\,x)^{11/4}}-\left(10\,\sqrt{2}\,d^{11/4}\,\left((a+b\,x)\,(c+d\,x)\right)^{3/4}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\right.$$

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

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

$$\left(231\,b^{9/4}\,\sqrt{b\,c-a\,d}\,(a+b\,x)^{3/4}\,(c+d\,x)^{3/4}\,(b\,c+a\,d+2\,b\,d\,x)\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)$$

Result (type 5, 140 leaves):

$$\left(4\,(c+d\,x)^{1/4}\right.$$

$$\left(-10\,a^2\,d^2-2\,a\,b\,d\,(3\,c+13\,d\,x)+b^2\,(21\,c^2+36\,c\,d\,x+5\,d^2\,x^2)+10\,d^2\,(a+b\,x)^2\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{3/4}\right.$$

$$\left.\left.\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\right)\Big/\left(231\,b^2\,(-b\,c+a\,d)\,(a+b\,x)^{11/4}\right)$$

Problem 1692: Result unnecessarily involves higher level functions.

$$\int\frac{(c+d\,x)^{5/4}}{(a+b\,x)^{19/4}}\,dx$$

Optimal (type 4, 401 leaves, 7 steps):

$$-\frac{4 d (c+d x)^{1/4}}{33 b^2 (a+b x)^{11/4}}-\frac{4 d^2 (c+d x)^{1/4}}{231 b^2 (b c-a d) (a+b x)^{7/4}}+\frac{8 d^3 (c+d x)^{1/4}}{231 b^2 (b c-a d)^2 (a+b x)^{3/4}}-\frac{4 (c+d x)^{5/4}}{15 b (a+b x)^{15/4}}+\left(4 \sqrt{2} d^{15/4} ((a+b x) (c+d x))^{3/4} \sqrt{(b c+a d+2 b d x)^2} \left(1+\frac{2 \sqrt{b} \sqrt{d} \sqrt{(a+b x) (c+d x)}}{b c-a d}\right) \sqrt{\frac{(a d+b (c+2 d x))^2}{(b c-a d)^2 \left(1+\frac{2 \sqrt{b} \sqrt{d} \sqrt{(a+b x) (c+d x)}}{b c-a d}\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{\sqrt{2} b^{1/4} d^{1/4} ((a+b x) (c+d x))^{1/4}}{\sqrt{b c-a d}}\right], \frac{1}{2}\right]\right) \Big/ \left(231 b^{9/4} (b c-a d)^{3/2} (a+b x)^{3/4} (c+d x)^{3/4} (b c+a d+2 b d x) \sqrt{(a d+b (c+2 d x))^2}\right)$$

Result (type 5, 179 leaves):

$$\left(4 (c+d x)^{1/4} \left(-20 a^3 d^3-12 a^2 b d^2 (c+6 d x)+a b^2 d \left(119 c^2+214 c d x+35 d^2 x^2\right)-b^3 \left(77 c^3+112 c^2 d x+5 c d^2 x^2-10 d^3 x^3\right)+20 d^3 (a+b x)^3 \left(\frac{d (a+b x)}{-b c+a d}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{3}{4}, \frac{5}{4}, \frac{b (c+d x)}{b c-a d}\right]\right)\right) \Big/ \left(1155 b^2 (b c-a d)^2 (a+b x)^{15/4}\right)$$

Problem 1693: Result unnecessarily involves higher level functions.

$$\int \frac{(a+b x)^{5/4}}{(c+d x)^{1/4}} \, dx$$

Optimal (type 3, 167 leaves, 7 steps):

$$-\frac{5 (b c-a d) (a+b x)^{1/4} (c+d x)^{3/4}}{8 d^2}+\frac{(a+b x)^{5/4} (c+d x)^{3/4}}{2 d}+\frac{5 (b c-a d)^2 \text{ArcTan}\left[\frac{d^{1/4} (a+b x)^{1/4}}{b^{1/4} (c+d x)^{1/4}}\right]}{16 b^{3/4} d^{9/4}}+\frac{5 (b c-a d)^2 \text{ArcTanh}\left[\frac{d^{1/4} (a+b x)^{1/4}}{b^{1/4} (c+d x)^{1/4}}\right]}{16 b^{3/4} d^{9/4}}$$

Result (type 5, 108 leaves):

$$\frac{1}{24\,d^3\,(a+b\,x)^{3/4}}(c+d\,x)^{3/4}\left(3\,d\,(a+b\,x)\,(-5\,b\,c+9\,a\,d+4\,b\,d\,x)+5\,(b\,c-a\,d)^2\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)$$

Problem 1694: Result unnecessarily involves higher level functions.

$$\int\frac{(a+b\,x)^{1/4}}{(c+d\,x)^{1/4}}\,dx$$

Optimal (type 3, 127 leaves, 6 steps):

$$\frac{(a+b\,x)^{1/4}\,(c+d\,x)^{3/4}}{d}-\frac{(b\,c-a\,d)\,\text{ArcTan}\left[\frac{d^{1/4}\,(a+b\,x)^{1/4}}{b^{1/4}\,(c+d\,x)^{1/4}}\right]}{2\,b^{3/4}\,d^{5/4}}-\frac{(b\,c-a\,d)\,\text{ArcTanh}\left[\frac{d^{1/4}\,(a+b\,x)^{1/4}}{b^{1/4}\,(c+d\,x)^{1/4}}\right]}{2\,b^{3/4}\,d^{5/4}}$$

Result (type 5, 76 leaves):

$$\frac{(a+b\,x)^{1/4}\,(c+d\,x)^{3/4}\left(3+\frac{\text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]}{\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{1/4}}\right)}{3\,d}$$

Problem 1695: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(a+b\,x)^{3/4}\,(c+d\,x)^{1/4}}\,dx$$

Optimal (type 3, 85 leaves, 5 steps):

$$\frac{2\,\text{ArcTan}\left[\frac{d^{1/4}\,(a+b\,x)^{1/4}}{b^{1/4}\,(c+d\,x)^{1/4}}\right]}{b^{3/4}\,d^{1/4}}+\frac{2\,\text{ArcTanh}\left[\frac{d^{1/4}\,(a+b\,x)^{1/4}}{b^{1/4}\,(c+d\,x)^{1/4}}\right]}{b^{3/4}\,d^{1/4}}$$

Result (type 5, 73 leaves):

$$\frac{4\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{3/4}(c+d\,x)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]}{3\,d\,(a+b\,x)^{3/4}}$$

Problem 1700: Result unnecessarily involves higher level functions.

$$\int\frac{(a+b\,x)^{7/4}}{(c+d\,x)^{1/4}}\,dx$$

Optimal (type 4, 751 leaves, 7 steps):

$$-\frac{7\,(b\,c-a\,d)\,(a+b\,x)^{3/4}\,(c+d\,x)^{3/4}}{15\,d^2}+\frac{2\,(a+b\,x)^{7/4}\,(c+d\,x)^{3/4}}{5\,d}+$$

$$\left(7\,(b\,c-a\,d)\,\sqrt{(a+b\,x)\,(c+d\,x)}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)\Bigg/$$

$$\left(10\,\sqrt{b}\,d^{5/2}\,(a+b\,x)^{1/4}\,(c+d\,x)^{1/4}\,(b\,c+a\,d+2\,b\,d\,x)\left(1+\frac{2\,\sqrt{b}\,\sqrt{d}\,\sqrt{(a+b\,x)\,(c+d\,x)}}{b\,c-a\,d}\right)\right)-$$

$$\left(7\,(b\,c-a\,d)^{7/2}\,((a+b\,x)\,(c+d\,x))^{1/4}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\right.$$

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

$$\left.\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,b^{1/4}\,d^{1/4}\,((a+b\,x)\,(c+d\,x))^{1/4}}{\sqrt{b\,c-a\,d}}\right],\,\frac{1}{2}\right]\right)\Bigg/$$

$$\left(10\,\sqrt{2}\,b^{3/4}\,d^{11/4}\,(a+b\,x)^{1/4}\,(c+d\,x)^{1/4}\,(b\,c+a\,d+2\,b\,d\,x)\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)+$$

$$\left(7\,(b\,c-a\,d)^{7/2}\,((a+b\,x)\,(c+d\,x))^{1/4}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\right.$$

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

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

$$\left(20\,\sqrt{2}\,b^{3/4}\,d^{11/4}\,(a+b\,x)^{1/4}\,(c+d\,x)^{1/4}\,(b\,c+a\,d+2\,b\,d\,x)\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)$$

Result (type 5, 107 leaves) :

$$\frac{1}{15\,d^3\,(a+b\,x)^{1/4}}\,(c+d\,x)^{3/4}\left(d\,(a+b\,x)\,(-7\,b\,c+13\,a\,d+6\,b\,d\,x)+\right.$$
$$\left.7\,(b\,c-a\,d)^2\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)$$

Problem 1701: Result unnecessarily involves higher level functions.

$$\int\frac{(a+b\,x)^{3/4}}{(c+d\,x)^{1/4}}\,dx$$

Optimal (type 4, 705 leaves, 6 steps):

$$\frac{2\,(a+b\,x)^{3/4}\,(c+d\,x)^{3/4}}{3\,d} - \left(\sqrt{(a+b\,x)\,(c+d\,x)}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)\Big/$$
$$\left(\sqrt{b}\,d^{3/2}\,(a+b\,x)^{1/4}\,(c+d\,x)^{1/4}\,(b\,c+a\,d+2\,b\,d\,x)\left(1+\frac{2\,\sqrt{b}\,\sqrt{d}\,\sqrt{(a+b\,x)\,(c+d\,x)}}{b\,c-a\,d}\right)\right)+$$
$$\left((b\,c-a\,d)^{5/2}\,((a+b\,x)\,(c+d\,x))^{1/4}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\right.$$
$$\left(1+\frac{2\,\sqrt{b}\,\sqrt{d}\,\sqrt{(a+b\,x)\,(c+d\,x)}}{b\,c-a\,d}\right)\sqrt{\frac{(a\,d+b\,(c+2\,d\,x))^2}{(b\,c-a\,d)^2\left(1+\frac{2\sqrt{b}\,\sqrt{d}\,\sqrt{(a+b\,x)\,(c+d\,x)}}{b\,c-a\,d}\right)^2}}$$
$$\left.\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,b^{1/4}\,d^{1/4}\,((a+b\,x)\,(c+d\,x))^{1/4}}{\sqrt{b\,c-a\,d}}\right],\frac{1}{2}\right]\right)\Big/$$
$$\left(\sqrt{2}\,b^{3/4}\,d^{7/4}\,(a+b\,x)^{1/4}\,(c+d\,x)^{1/4}\,(b\,c+a\,d+2\,b\,d\,x)\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)-$$
$$\left((b\,c-a\,d)^{5/2}\,((a+b\,x)\,(c+d\,x))^{1/4}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\right.$$
$$\left(1+\frac{2\,\sqrt{b}\,\sqrt{d}\,\sqrt{(a+b\,x)\,(c+d\,x)}}{b\,c-a\,d}\right)\sqrt{\frac{(a\,d+b\,(c+2\,d\,x))^2}{(b\,c-a\,d)^2\left(1+\frac{2\sqrt{b}\,\sqrt{d}\,\sqrt{(a+b\,x)\,(c+d\,x)}}{b\,c-a\,d}\right)^2}}$$
$$\left.\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,b^{1/4}\,d^{1/4}\,((a+b\,x)\,(c+d\,x))^{1/4}}{\sqrt{b\,c-a\,d}}\right],\frac{1}{2}\right]\right)\Big/$$
$$\left(2\,\sqrt{2}\,b^{3/4}\,d^{7/4}\,(a+b\,x)^{1/4}\,(c+d\,x)^{1/4}\,(b\,c+a\,d+2\,b\,d\,x)\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)$$

Result (type 5, 76 leaves):

$$\frac{2\,(a+b\,x)^{3/4}\,(c+d\,x)^{3/4}\left(1+\frac{\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]}{\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{3/4}}\right)}{3\,d}$$

Problem 1702: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a+b x)^{1/4} (c+d x)^{1/4}} \, dx$$

Optimal (type 4, 688 leaves, 5 steps) :

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

Result (type 5, 73 leaves):

$$\frac{4\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{1/4}(c+d\,x)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]}{3\,d\,(a+b\,x)^{1/4}}$$

Problem 1703: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a+b\,x)^{5/4}\,(c+d\,x)^{1/4}}\,dx$$

Optimal (type 4, 718 leaves, 6 steps):

$$-\frac{4\,(c+d\,x)^{3/4}}{(b\,c-a\,d)\,(a+b\,x)^{1/4}}+\left(4\,\sqrt{d}\,\sqrt{(a+b\,x)\,(c+d\,x)}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)\Big/$$

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

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

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

$$\left.\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,b^{1/4}\,d^{1/4}\,((a+b\,x)\,(c+d\,x))^{1/4}}{\sqrt{b\,c-a\,d}}\right],\frac{1}{2}\right]\right)\Big/$$

$$\left(b^{3/4}\,(a+b\,x)^{1/4}\,(c+d\,x)^{1/4}\,(b\,c+a\,d+2\,b\,d\,x)\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)+$$

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

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

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

$$\left(b^{3/4}\,(a+b\,x)^{1/4}\,(c+d\,x)^{1/4}\,(b\,c+a\,d+2\,b\,d\,x)\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)$$

Result (type 5, 84 leaves) :

$$\left(4\,(c+d\,x)^{3/4}\left(-3+2\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{3}{4},\,\frac{7}{4},\,\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\right)\Big/\left(3\,(b\,c-a\,d)\,(a+b\,x)^{1/4}\right)$$

Problem 1704: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(a+b\,x)^{9/4}\,(c+d\,x)^{1/4}}\,dx$$

Optimal (type 4, 760 leaves, 7 steps):

$$-\frac{4\,(c+d\,x)^{3/4}}{5\,(b\,c-a\,d)\,(a+b\,x)^{5/4}}+\frac{8\,d\,(c+d\,x)^{3/4}}{5\,(b\,c-a\,d)^2\,(a+b\,x)^{1/4}}-$$

$$\left(8\,d^{3/2}\sqrt{(a+b\,x)\,(c+d\,x)}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)\Big/\left(5\,\sqrt{b}\,(b\,c-a\,d)^3\right.$$

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

$$\left(4\,\sqrt{2}\,d^{5/4}\,((a+b\,x)\,(c+d\,x))^{1/4}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\left(1+\frac{2\,\sqrt{b}\,\sqrt{d}\,\sqrt{(a+b\,x)\,(c+d\,x)}}{b\,c-a\,d}\right)\right.$$

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

$$\left.\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,b^{1/4}\,d^{1/4}\,((a+b\,x)\,(c+d\,x))^{1/4}}{\sqrt{b\,c-a\,d}}\right],\frac{1}{2}\right]\right)\Big/$$

$$\left(5\,b^{3/4}\,\sqrt{b\,c-a\,d}\,(a+b\,x)^{1/4}\,(c+d\,x)^{1/4}\,(b\,c+a\,d+2\,b\,d\,x)\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)-$$

$$\left(2\,\sqrt{2}\,d^{5/4}\,((a+b\,x)\,(c+d\,x))^{1/4}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\right.$$

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

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

$$\left(5\,b^{3/4}\,\sqrt{b\,c-a\,d}\,(a+b\,x)^{1/4}\,(c+d\,x)^{1/4}\,(b\,c+a\,d+2\,b\,d\,x)\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)$$

Result (type 5, 102 leaves) :

$$-\left(\left(4\,(c+d\,x)^{3/4}\left(-9\,a\,d+3\,b\,(c-2\,d\,x)+4\,d\,(a+b\,x)\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{1/4}\right.\right.\right.$$
$$\left.\left.\left.\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\right)\Big/\left(15\,(b\,c-a\,d)^2\,(a+b\,x)^{5/4}\right)\right)$$

Problem 1705: Result unnecessarily involves higher level functions.

$$\int\frac{(a+b\,x)^{7/4}}{(c+d\,x)^{3/4}}\,dx$$

Optimal (type 3, 167 leaves, 7 steps):

$$-\frac{7\,(b\,c-a\,d)\,(a+b\,x)^{3/4}\,(c+d\,x)^{1/4}}{8\,d^2}+\frac{(a+b\,x)^{7/4}\,(c+d\,x)^{1/4}}{2\,d}-\frac{21\,(b\,c-a\,d)^2\,\text{ArcTan}\left[\frac{d^{1/4}\,(a+b\,x)^{1/4}}{b^{1/4}\,(c+d\,x)^{1/4}}\right]}{16\,b^{1/4}\,d^{11/4}}+\frac{21\,(b\,c-a\,d)^2\,\text{ArcTanh}\left[\frac{d^{1/4}\,(a+b\,x)^{1/4}}{b^{1/4}\,(c+d\,x)^{1/4}}\right]}{16\,b^{1/4}\,d^{11/4}}$$

Result (type 5, 107 leaves):

$$\frac{1}{8\,d^3\,(a+b\,x)^{1/4}}(c+d\,x)^{1/4}\left(d\,(a+b\,x)\,(-7\,b\,c+11\,a\,d+4\,b\,d\,x)+\right.$$
$$\left.21\,(b\,c-a\,d)^2\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)$$

Problem 1706: Result unnecessarily involves higher level functions.

$$\int\frac{(a+b\,x)^{3/4}}{(c+d\,x)^{3/4}}\,dx$$

Optimal (type 3, 127 leaves, 6 steps):

$$\frac{(a+b\,x)^{3/4}\,(c+d\,x)^{1/4}}{d}+\frac{3\,(b\,c-a\,d)\,\text{ArcTan}\left[\frac{d^{1/4}\,(a+b\,x)^{1/4}}{b^{1/4}\,(c+d\,x)^{1/4}}\right]}{2\,b^{1/4}\,d^{7/4}}-\frac{3\,(b\,c-a\,d)\,\text{ArcTanh}\left[\frac{d^{1/4}\,(a+b\,x)^{1/4}}{b^{1/4}\,(c+d\,x)^{1/4}}\right]}{2\,b^{1/4}\,d^{7/4}}$$

Result (type 5, 74 leaves):

$$\frac{(a+b\,x)^{3/4}\,(c+d\,x)^{1/4}\left(1+\frac{3\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]}{\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{3/4}}\right)}{d}$$

Problem 1707: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(a+b\,x)^{1/4}\,(c+d\,x)^{3/4}}\,dx$$

Optimal (type 3, 85 leaves, 5 steps):

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

Result (type 5, 71 leaves):

$$\frac{4\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{1/4}(c+d\,x)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]}{d\,(a+b\,x)^{1/4}}$$

Problem 1712: Result unnecessarily involves higher level functions.

$$\int\frac{(a+b\,x)^{5/4}}{(c+d\,x)^{3/4}}\,dx$$

Optimal (type 4, 332 leaves, 5 steps):

$$-\frac{5\,(b\,c-a\,d)\,(a+b\,x)^{1/4}\,(c+d\,x)^{1/4}}{3\,d^2}+\frac{2\,(a+b\,x)^{5/4}\,(c+d\,x)^{1/4}}{3\,d}+$$

$$\left(5\,(b\,c-a\,d)^{5/2}\,((a+b\,x)\,(c+d\,x))^{3/4}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\right.$$

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

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

$$\left(6\,\sqrt{2}\,b^{1/4}\,d^{9/4}\,(a+b\,x)^{3/4}\,(c+d\,x)^{3/4}\,(b\,c+a\,d+2\,b\,d\,x)\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)$$

Result (type 5, 107 leaves):

$$\frac{1}{3\,d^3\,(a+b\,x)^{3/4}}(c+d\,x)^{1/4}\left(d\,(a+b\,x)\,(-5\,b\,c+7\,a\,d+2\,b\,d\,x)+\right.$$

$$\left.5\,(b\,c-a\,d)^2\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)$$

Problem 1713: Result unnecessarily involves higher level functions.

$$\int\frac{(a+b\,x)^{1/4}}{(c+d\,x)^{3/4}}\,dx$$

Optimal (type 4, 295 leaves, 4 steps):

$$\frac{2\,(a+b\,x)^{1/4}\,(c+d\,x)^{1/4}}{d}-\left((b\,c-a\,d)^{3/2}\,\left((a+b\,x)\,(c+d\,x)\right)^{3/4}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\,\left(1+\frac{2\,\sqrt{b}\,\sqrt{d}\,\sqrt{(a+b\,x)\,(c+d\,x)}}{b\,c-a\,d}\right)\sqrt{\frac{(a\,d+b\,(c+2\,d\,x))^2}{(b\,c-a\,d)^2\,\left(1+\frac{2\,\sqrt{b}\,\sqrt{d}\,\sqrt{(a+b\,x)\,(c+d\,x)}}{b\,c-a\,d}\right)^2}}\;\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,b^{1/4}\,d^{1/4}\,\left((a+b\,x)\,(c+d\,x)\right)^{1/4}}{\sqrt{b\,c-a\,d}}\right],\frac{1}{2}\right]\right)\Big/\left(\sqrt{2}\,b^{1/4}\,d^{5/4}\,(a+b\,x)^{3/4}\,(c+d\,x)^{3/4}\,(b\,c+a\,d+2\,b\,d\,x)\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)$$

Result (type 5, 74 leaves):

$$\frac{2\,(a+b\,x)^{1/4}\,(c+d\,x)^{1/4}\left(1+\frac{\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]}{\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{1/4}}\right)}{d}$$

Problem 1714: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(a+b\,x)^{3/4}\,(c+d\,x)^{3/4}}\,dx$$

Optimal (type 4, 270 leaves, 3 steps):

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

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

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

$$\left(b^{1/4}\,d^{1/4}\,(a+b\,x)^{3/4}\,(c+d\,x)^{3/4}\,(b\,c+a\,d+2\,b\,d\,x)\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)$$

Result (type 5, 71 leaves) :

$$\frac{4\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{3/4}(c+d\,x)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]}{d\,(a+b\,x)^{3/4}}$$

Problem 1715: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(a+b\,x)^{7/4}\,(c+d\,x)^{3/4}}\,dx$$

Optimal (type 4, 306 leaves, 4 steps) :

$$-\frac{4\,(c+d\,x)^{1/4}}{3\,(b\,c-a\,d)\,(a+b\,x)^{3/4}}-\left(2\,\sqrt{2}\,d^{3/4}\,\left((a+b\,x)\,(c+d\,x)\right)^{3/4}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\,\left(1+\frac{2\,\sqrt{b}\,\sqrt{d}\,\sqrt{(a+b\,x)\,(c+d\,x)}}{b\,c-a\,d}\right)\right.$$

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

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

$$\left(3\,b^{1/4}\,\sqrt{b\,c-a\,d}\,(a+b\,x)^{3/4}\,(c+d\,x)^{3/4}\,(b\,c+a\,d+2\,b\,d\,x)\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)$$

Result (type 5, 84 leaves) :

$$-\left(\left(4\,(c+d\,x)^{1/4}\,\left(1+2\,\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{3}{4},\,\frac{5}{4},\,\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\right)\Big/\right.$$

$$\left.\left(3\,(b\,c-a\,d)\,(a+b\,x)^{3/4}\right)\right)$$

Problem 1716: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a+b\,x)^{11/4}\,(c+d\,x)^{3/4}}\,dx$$

Optimal (type 4, 339 leaves, 5 steps) :

$$-\frac{4\,(c+d\,x)^{1/4}}{7\,(b\,c-a\,d)\,(a+b\,x)^{7/4}}+\frac{8\,d\,(c+d\,x)^{1/4}}{7\,(b\,c-a\,d)^2\,(a+b\,x)^{3/4}}+$$

$$\left(4\,\sqrt{2}\,d^{7/4}\,\left((a+b\,x)\,(c+d\,x)\right)^{3/4}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\right.$$

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

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

$$\left(7\,b^{1/4}\,(b\,c-a\,d)^{3/2}\,(a+b\,x)^{3/4}\,(c+d\,x)^{3/4}\,(b\,c+a\,d+2\,b\,d\,x)\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)$$

Result (type 5, 102 leaves):

$$\left(4\,(c+d\,x)^{1/4}\left(-b\,c+3\,a\,d+2\,b\,d\,x+4\,d\,(a+b\,x)\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{3/4}\right.\right.$$

$$\left.\left.\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\right)\Big/\left(7\,(b\,c-a\,d)^2\,(a+b\,x)^{7/4}\right)$$

Problem 1717: Result unnecessarily involves higher level functions.

$$\int\frac{(a+b\,x)^{5/4}}{(c+d\,x)^{5/4}}\,dx$$

Optimal (type 3, 152 leaves, 7 steps):

$$-\frac{4\,(a+b\,x)^{5/4}}{d\,(c+d\,x)^{1/4}}+\frac{5\,b\,(a+b\,x)^{1/4}\,(c+d\,x)^{3/4}}{d^2}-$$

$$\frac{5\,b^{1/4}\,(b\,c-a\,d)\,\text{ArcTan}\left[\frac{d^{1/4}\,(a+b\,x)^{1/4}}{b^{1/4}\,(c+d\,x)^{1/4}}\right]}{2\,d^{9/4}}-\frac{5\,b^{1/4}\,(b\,c-a\,d)\,\text{ArcTanh}\left[\frac{d^{1/4}\,(a+b\,x)^{1/4}}{b^{1/4}\,(c+d\,x)^{1/4}}\right]}{2\,d^{9/4}}$$

Result (type 5, 99 leaves):

$$\frac{1}{3\,d^2}(a+b\,x)^{1/4}\,(c+d\,x)^{3/4}\left(\frac{3\,(5\,b\,c-4\,a\,d+b\,d\,x)}{c+d\,x}+\frac{5\,b\,\text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]}{\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{1/4}}\right)$$

Problem 1718: Result unnecessarily involves higher level functions.

$$\int \frac{(a+b\,x)^{1/4}}{(c+d\,x)^{5/4}}\,dx$$

Optimal (type 3, 108 leaves, 6 steps):

$$-\frac{4\,(a+b\,x)^{1/4}}{d\,(c+d\,x)^{1/4}}+\frac{2\,b^{1/4}\,\text{ArcTan}\left[\frac{d^{1/4}\,(a+b\,x)^{1/4}}{b^{1/4}\,(c+d\,x)^{1/4}}\right]}{d^{5/4}}+\frac{2\,b^{1/4}\,\text{ArcTanh}\left[\frac{d^{1/4}\,(a+b\,x)^{1/4}}{b^{1/4}\,(c+d\,x)^{1/4}}\right]}{d^{5/4}}$$

Result (type 5, 89 leaves):

$$\left(4\left(-3\,d\,(a+b\,x)+b\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{3/4}(c+d\,x)\,\text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\right)\Big/\left(3\,d^2\,(a+b\,x)^{3/4}\,(c+d\,x)^{1/4}\right)$$

Problem 1723: Result unnecessarily involves higher level functions.

$$\int \frac{(a+b\,x)^{11/4}}{(c+d\,x)^{5/4}}\,dx$$

Optimal (type 4, 776 leaves, 8 steps):

$$-\frac{4\,(a+b\,x)^{11/4}}{d\,(c+d\,x)^{1/4}}-\frac{77\,b\,(b\,c-a\,d)\,(a+b\,x)^{3/4}\,(c+d\,x)^{3/4}}{15\,d^3}+\frac{22\,b\,(a+b\,x)^{7/4}\,(c+d\,x)^{3/4}}{5\,d^2}+$$

$$\left(77\,\sqrt{b}\,(b\,c-a\,d)\,\sqrt{(a+b\,x)\,(c+d\,x)}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)\Big/$$

$$\left(10\,d^{7/2}\,(a+b\,x)^{1/4}\,(c+d\,x)^{1/4}\,(b\,c+a\,d+2\,b\,d\,x)\left(1+\frac{2\,\sqrt{b}\,\sqrt{d}\,\sqrt{(a+b\,x)\,(c+d\,x)}}{b\,c-a\,d}\right)\right)-$$

$$\left(77\,b^{1/4}\,(b\,c-a\,d)^{7/2}\,((a+b\,x)\,(c+d\,x))^{1/4}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\right.$$

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

$$\left.\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,b^{1/4}\,d^{1/4}\,((a+b\,x)\,(c+d\,x))^{1/4}}{\sqrt{b\,c-a\,d}}\right],\frac{1}{2}\right]\right)\Big/$$

$$\left(10\,\sqrt{2}\,d^{15/4}\,(a+b\,x)^{1/4}\,(c+d\,x)^{1/4}\,(b\,c+a\,d+2\,b\,d\,x)\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)+$$

$$\left(77\,b^{1/4}\,(b\,c-a\,d)^{7/2}\,((a+b\,x)\,(c+d\,x))^{1/4}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\right.$$

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

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

$$\left(20\,\sqrt{2}\,d^{15/4}\,(a+b\,x)^{1/4}\,(c+d\,x)^{1/4}\,(b\,c+a\,d+2\,b\,d\,x)\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)$$

Result (type 5, 132 leaves) :

$$\frac{1}{15\,d^4\,(a+b\,x)^{1/4}}(c+d\,x)^{3/4}\left(d\,(a+b\,x)\,\left(b\,(-17\,b\,c+23\,a\,d)+6\,b^2\,d\,x-\frac{60\,(b\,c-a\,d)^2}{c+d\,x}\right)+\right.$$
$$\left.77\,b\,(b\,c-a\,d)^2\,\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{3}{4},\,\frac{7}{4},\,\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)$$

Problem 1724: Result unnecessarily involves higher level functions.

$$\int\frac{(a+b\,x)^{7/4}}{(c+d\,x)^{5/4}}\,dx$$

Optimal (type 4, 730 leaves, 7 steps):

$$-\frac{4\,(a+b\,x)^{7/4}}{d\,(c+d\,x)^{1/4}}+\frac{14\,b\,(a+b\,x)^{3/4}\,(c+d\,x)^{3/4}}{3\,d^2}-\left(7\,\sqrt{b}\,\sqrt{(a+b\,x)\,(c+d\,x)}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)\Big/\left(d^{5/2}\,(a+b\,x)^{1/4}\,(c+d\,x)^{1/4}\,(b\,c+a\,d+2\,b\,d\,x)\left(1+\frac{2\,\sqrt{b}\,\sqrt{d}\,\sqrt{(a+b\,x)\,(c+d\,x)}}{b\,c-a\,d}\right)\right)+\left(7\,b^{1/4}\,(b\,c-a\,d)^{5/2}\,((a+b\,x)\,(c+d\,x))^{1/4}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\left(1+\frac{2\,\sqrt{b}\,\sqrt{d}\,\sqrt{(a+b\,x)\,(c+d\,x)}}{b\,c-a\,d}\right)\sqrt{\frac{(a\,d+b\,(c+2\,d\,x))^2}{(b\,c-a\,d)^2\left(1+\frac{2\,\sqrt{b}\,\sqrt{d}\,\sqrt{(a+b\,x)\,(c+d\,x)}}{b\,c-a\,d}\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,b^{1/4}\,d^{1/4}\,((a+b\,x)\,(c+d\,x))^{1/4}}{\sqrt{b\,c-a\,d}}\right],\frac{1}{2}\right]\right)\Big/\left(\sqrt{2}\,d^{11/4}\,(a+b\,x)^{1/4}\,(c+d\,x)^{1/4}\,(b\,c+a\,d+2\,b\,d\,x)\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)-\left(7\,b^{1/4}\,(b\,c-a\,d)^{5/2}\,((a+b\,x)\,(c+d\,x))^{1/4}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\left(1+\frac{2\,\sqrt{b}\,\sqrt{d}\,\sqrt{(a+b\,x)\,(c+d\,x)}}{b\,c-a\,d}\right)\sqrt{\frac{(a\,d+b\,(c+2\,d\,x))^2}{(b\,c-a\,d)^2\left(1+\frac{2\,\sqrt{b}\,\sqrt{d}\,\sqrt{(a+b\,x)\,(c+d\,x)}}{b\,c-a\,d}\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,b^{1/4}\,d^{1/4}\,((a+b\,x)\,(c+d\,x))^{1/4}}{\sqrt{b\,c-a\,d}}\right],\frac{1}{2}\right]\right)\Big/\left(2\,\sqrt{2}\,d^{11/4}\,(a+b\,x)^{1/4}\,(c+d\,x)^{1/4}\,(b\,c+a\,d+2\,b\,d\,x)\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)$$

Result (type 5, 98 leaves) :

$$\frac{1}{3 d^2} 2 (a+b x)^{3/4} (c+d x)^{3/4} \left(\frac{7 b c-6 a d+b d x}{c+d x}+\frac{7 b \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{b (c+d x)}{b c-a d}\right]}{\left(\frac{d (a+b x)}{-b c+a d}\right)^{3/4}}\right)$$

Problem 1725: Result unnecessarily involves higher level functions.

$$\int \frac{(a+b x)^{3/4}}{(c+d x)^{5/4}} \, dx$$

Optimal (type 4, 712 leaves, 6 steps):

$$-\frac{4\,(a+b\,x)^{3/4}}{d\,(c+d\,x)^{1/4}}+\left(6\,\sqrt{b}\,\sqrt{(a+b\,x)\,(c+d\,x)}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)\Bigg/$$

$$\left(d^{3/2}\,(b\,c-a\,d)\,(a+b\,x)^{1/4}\,(c+d\,x)^{1/4}\,(b\,c+a\,d+2\,b\,d\,x)\left(1+\frac{2\,\sqrt{b}\,\sqrt{d}\,\sqrt{(a+b\,x)\,(c+d\,x)}}{b\,c-a\,d}\right)\right)-$$

$$\left(3\,\sqrt{2}\,b^{1/4}\,(b\,c-a\,d)^{3/2}\,((a+b\,x)\,(c+d\,x))^{1/4}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\right.$$

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

$$\left.\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,b^{1/4}\,d^{1/4}\,((a+b\,x)\,(c+d\,x))^{1/4}}{\sqrt{b\,c-a\,d}}\right],\frac{1}{2}\right]\right)\Bigg/$$

$$\left(d^{7/4}\,(a+b\,x)^{1/4}\,(c+d\,x)^{1/4}\,(b\,c+a\,d+2\,b\,d\,x)\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)+$$

$$\left(3\,b^{1/4}\,(b\,c-a\,d)^{3/2}\,((a+b\,x)\,(c+d\,x))^{1/4}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\right.$$

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

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

$$\left(\sqrt{2}\,d^{7/4}\,(a+b\,x)^{1/4}\,(c+d\,x)^{1/4}\,(b\,c+a\,d+2\,b\,d\,x)\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)$$

Result (type 5, 87 leaves):

$$\left(-4\,d\,(a+b\,x)+4\,b\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{1/4}(c+d\,x)\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\Bigg/$$

$$\left(d^2\,(a+b\,x)^{1/4}\,(c+d\,x)^{1/4}\right)$$

Problem 1726: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a+b x)^{1/4} (c+d x)^{5/4}} \, dx$$

Optimal (type 4, 719 leaves, 6 steps):

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

Result (type 5, 100 leaves):

$$\left(12\,d\,(a+b\,x)-8\,b\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{1/4}(c+d\,x)\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\Big/$$
$$\left(3\,d\,(b\,c-a\,d)\,(a+b\,x)^{1/4}\,(c+d\,x)^{1/4}\right)$$

Problem 1727: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a+b x)^{5/4} (c+d x)^{5/4}} \, dx$$

Optimal (type 4, 750 leaves, 7 steps) :

$$-\frac{4}{(b c-a d)(a+b x)^{1/4}(c+d x)^{1/4}}-\frac{8 d (a+b x)^{3/4}}{(b c-a d)^2 (c+d x)^{1/4}}+$$

$$\left(8\sqrt{b}\sqrt{d}\sqrt{(a+b x)(c+d x)}\sqrt{(b c+a d+2 b d x)^2}\sqrt{(a d+b (c+2 d x))^2}\right)\Big/$$

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

$$\left(4\sqrt{2}\, b^{1/4} d^{1/4}((a+b x)(c+d x))^{1/4}\sqrt{(b c+a d+2 b d x)^2}\right.$$

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

$$\left.\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\, b^{1/4} d^{1/4}((a+b x)(c+d x))^{1/4}}{\sqrt{b c-a d}}\right],\frac{1}{2}\right]\right)\Big/$$

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

$$\left(2\sqrt{2}\, b^{1/4} d^{1/4}((a+b x)(c+d x))^{1/4}\sqrt{(b c+a d+2 b d x)^2}\right.$$

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

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

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

Result (type 5, 102 leaves) :

$$-\left(\left(4\left(3 a d+3 b (c+2 d x)-4 b \left(\frac{d (a+b x)}{-b c+a d}\right)^{1/4} (c+d x)\right.\right.\right.$$
$$\left.\left.\left.\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{b (c+d x)}{b c-a d}\right]\right)\right)\Big/\left(3 (b c-a d)^2 (a+b x)^{1/4} (c+d x)^{1/4}\right)\right)$$

Problem 1728: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a+b x)^{9/4} (c+d x)^{5/4}} \, dx$$

Optimal (type 4, 795 leaves, 8 steps):

$$-\frac{4}{5\,(b\,c-a\,d)\,(a+b\,x)^{5/4}\,(c+d\,x)^{1/4}}+\frac{24\,d}{5\,(b\,c-a\,d)^2\,(a+b\,x)^{1/4}\,(c+d\,x)^{1/4}}+\frac{48\,d^2\,(a+b\,x)^{3/4}}{5\,(b\,c-a\,d)^3\,(c+d\,x)^{1/4}}-$$

$$\left(48\,\sqrt{b}\,d^{3/2}\,\sqrt{(a+b\,x)\,(c+d\,x)}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)\Big/$$

$$\left(5\,(b\,c-a\,d)^4\,(a+b\,x)^{1/4}\,(c+d\,x)^{1/4}\,(b\,c+a\,d+2\,b\,d\,x)\left(1+\frac{2\,\sqrt{b}\,\sqrt{d}\,\sqrt{(a+b\,x)\,(c+d\,x)}}{b\,c-a\,d}\right)\right)+$$

$$\left(24\,\sqrt{2}\,b^{1/4}\,d^{5/4}\,((a+b\,x)\,(c+d\,x))^{1/4}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\right.$$

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

$$\left.\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{\sqrt{2}\,b^{1/4}\,d^{1/4}\,((a+b\,x)\,(c+d\,x))^{1/4}}{\sqrt{b\,c-a\,d}}\right],\frac{1}{2}\right]\right)\Big/$$

$$\left(5\,(b\,c-a\,d)^{3/2}\,(a+b\,x)^{1/4}\,(c+d\,x)^{1/4}\,(b\,c+a\,d+2\,b\,d\,x)\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)-$$

$$\left(12\,\sqrt{2}\,b^{1/4}\,d^{5/4}\,((a+b\,x)\,(c+d\,x))^{1/4}\,\sqrt{(b\,c+a\,d+2\,b\,d\,x)^2}\right.$$

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

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

$$\left(5\,(b\,c-a\,d)^{3/2}\,(a+b\,x)^{1/4}\,(c+d\,x)^{1/4}\,(b\,c+a\,d+2\,b\,d\,x)\,\sqrt{(a\,d+b\,(c+2\,d\,x))^2}\right)$$

Result (type 5, 139 leaves) :

$$-\left(\left(4\left(5 a^2 d^2+2 a b d (4 c+9 d x)+b^2\left(-c^2+6 c d x+12 d^2 x^2\right)-8 b d (a+b x)\left(\frac{d (a+b x)}{-b c+a d}\right)^{1/4}(c+d x)\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{b (c+d x)}{b c-a d}\right]\right)\right)\Big/\left(5 (-b c+a d)^3 (a+b x)^{5/4} (c+d x)^{1/4}\right)\right)$$

Problem 1729: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(1-a x)^{1/4} (1+b x)^{3/4}}\,dx$$

Optimal (type 3, 279 leaves, 11 steps):

$$\frac{\sqrt{2}\,\text{ArcTan}\left[1-\frac{\sqrt{2}\, b^{1/4} (1-a x)^{1/4}}{a^{1/4} (1+b x)^{1/4}}\right]}{a^{1/4} b^{3/4}}-\frac{\sqrt{2}\,\text{ArcTan}\left[1+\frac{\sqrt{2}\, b^{1/4} (1-a x)^{1/4}}{a^{1/4} (1+b x)^{1/4}}\right]}{a^{1/4} b^{3/4}}-\frac{\text{Log}\left[\sqrt{a}+\frac{\sqrt{b}\,\sqrt{1-a x}}{\sqrt{1+b x}}-\frac{\sqrt{2}\, a^{1/4} b^{1/4} (1-a x)^{1/4}}{(1+b x)^{1/4}}\right]}{\sqrt{2}\, a^{1/4} b^{3/4}}+\frac{\text{Log}\left[\sqrt{a}+\frac{\sqrt{b}\,\sqrt{1-a x}}{\sqrt{1+b x}}+\frac{\sqrt{2}\, a^{1/4} b^{1/4} (1-a x)^{1/4}}{(1+b x)^{1/4}}\right]}{\sqrt{2}\, a^{1/4} b^{3/4}}$$

Result (type 5, 63 leaves):

$$\frac{4 (1+b x)^{1/4}\left(\frac{b-a b x}{a+b}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},\frac{a+a b x}{a+b}\right]}{b (1-a x)^{1/4}}$$

Problem 1730: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(1-a x)^{1/4} (1+a x)^{3/4}}\,dx$$

Optimal (type 3, 193 leaves, 11 steps):

$$\frac{\sqrt{2}\,\text{ArcTan}\left[1-\frac{\sqrt{2}\,(1-a x)^{1/4}}{(1+a x)^{1/4}}\right]}{a}-\frac{\sqrt{2}\,\text{ArcTan}\left[1+\frac{\sqrt{2}\,(1-a x)^{1/4}}{(1+a x)^{1/4}}\right]}{a}-\frac{\text{Log}\left[1+\frac{\sqrt{1-a x}}{\sqrt{1+a x}}-\frac{\sqrt{2}\,(1-a x)^{1/4}}{(1+a x)^{1/4}}\right]}{\sqrt{2}\, a}+\frac{\text{Log}\left[1+\frac{\sqrt{1-a x}}{\sqrt{1+a x}}+\frac{\sqrt{2}\,(1-a x)^{1/4}}{(1+a x)^{1/4}}\right]}{\sqrt{2}\, a}$$

Result (type 5, 38 leaves):

$$\frac{2\times 2^{3/4} (1+a x)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},\frac{1}{2}(1+a x)\right]}{a}$$

Problem 1736: Result unnecessarily involves higher level functions.

$$\int (a+b x)^{5/2} (c+d x)^{1/6} \, dx$$

Optimal (type 4, 487 leaves, 6 steps):

$$\frac{81 (b c-a d)^3 \sqrt{a+b x} (c+d x)^{1/6}}{1408 b d^3}-\frac{9 (b c-a d)^2 (a+b x)^{3/2} (c+d x)^{1/6}}{352 b d^2}+\frac{3 (b c-a d) (a+b x)^{5/2} (c+d x)^{1/6}}{176 b d}+\frac{3 (a+b x)^{7/2} (c+d x)^{1/6}}{11 b}-\left(81\times 3^{3/4} (b c-a d)^{11/3} (c+d x)^{1/6} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right) \sqrt{\frac{(b c-a d)^{2/3}+b^{1/3} (b c-a d)^{1/3} (c+d x)^{1/3}+b^{2/3} (c+d x)^{2/3}}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}\right)^2}} \text{EllipticF}\left[\text{ArcCos}\left[\frac{(b c-a d)^{1/3}-\left(1-\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}}{(b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}}\right], \frac{1}{4} \left(2+\sqrt{3}\right)\right]\right) \Bigg/ \left(2816 b d^4 \sqrt{a+b x} \sqrt{-\frac{b^{1/3} (c+d x)^{1/3} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}\right)^2}}\right)$$

Result (type 5, 181 leaves):

$$-\left(\left(3 (c+d x)^{1/6} \left(-d (a+b x) \left(81 a^3 d^3+a^2 b d^2 (113 c+356 d x)+a b^2 d \left(-93 c^2+40 c d x+376 d^2 x^2\right)+b^3 \left(27 c^3-12 c^2 d x+8 c d^2 x^2+128 d^3 x^3\right)\right)+81 (b c-a d)^4 \sqrt{\frac{d (a+b x)}{-b c+a d}} \text{Hypergeometric2F1}\left[\frac{1}{6}, \frac{1}{2}, \frac{7}{6}, \frac{b (c+d x)}{b c-a d}\right]\right)\right) \Bigg/ \left(1408 b d^4 \sqrt{a+b x}\right)\right)$$

Problem 1737: Result unnecessarily involves higher level functions.

$$\int (a+b x)^{3/2} (c+d x)^{1/6} \, dx$$

Optimal (type 4, 449 leaves, 5 steps):

$$-\frac{27 (b c-a d)^2 \sqrt{a+b x} (c+d x)^{1/6}}{320 b d^2}+\frac{3 (b c-a d) (a+b x)^{3/2} (c+d x)^{1/6}}{80 b d}+\frac{3 (a+b x)^{5/2} (c+d x)^{1/6}}{8 b}+\left(27\times 3^{3/4} (b c-a d)^{8/3} (c+d x)^{1/6} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)\sqrt{\frac{(b c-a d)^{2/3}+b^{1/3} (b c-a d)^{1/3} (c+d x)^{1/3}+b^{2/3} (c+d x)^{2/3}}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}\right)^2}}\ \text{EllipticF}\left[\text{ArcCos}\left[\frac{(b c-a d)^{1/3}-\left(1-\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}}{(b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}}\right],\frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\Bigg/\left(640 b d^3 \sqrt{a+b x} \sqrt{-\frac{b^{1/3} (c+d x)^{1/3} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}\right)^2}}\right)$$

Result (type 5, 142 leaves):

$$-\frac{1}{320 b d^3 \sqrt{a+b x}}3 (c+d x)^{1/6} \left(-d (a+b x) \left(27 a^2 d^2+2 a b d (11 c+38 d x)+b^2 \left(-9 c^2+4 c d x+40 d^2 x^2\right)\right)-27 (b c-a d)^3 \sqrt{\frac{d (a+b x)}{-b c+a d}}\ \text{Hypergeometric2F1}\left[\frac{1}{6},\frac{1}{2},\frac{7}{6},\frac{b (c+d x)}{b c-a d}\right]\right)$$

Problem 1738: Result unnecessarily involves higher level functions.

$$\int \sqrt{a+b x} (c+d x)^{1/6} \, dx$$

Optimal (type 4, 411 leaves, 4 steps):

$$\frac{3\,(b\,c-a\,d)\,\sqrt{a+b\,x}\,(c+d\,x)^{1/6}}{20\,b\,d}+\frac{3\,(a+b\,x)^{3/2}\,(c+d\,x)^{1/6}}{5\,b}-$$

$$\left(3\times 3^{3/4}\,(b\,c-a\,d)^{5/3}\,(c+d\,x)^{1/6}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)\right.$$

$$\sqrt{\frac{(b\,c-a\,d)^{2/3}+b^{1/3}\,(b\,c-a\,d)^{1/3}\,(c+d\,x)^{1/3}+b^{2/3}\,(c+d\,x)^{2/3}}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}$$

$$\left.\text{EllipticF}\left[\text{ArcCos}\left[\frac{(b\,c-a\,d)^{1/3}-\left(1-\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}{(b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}\right],\,\frac{1}{4}\,\left(2+\sqrt{3}\right)\right]\right)\Bigg/$$

$$\left(40\,b\,d^2\,\sqrt{a+b\,x}\,\sqrt{-\frac{b^{1/3}\,(c+d\,x)^{1/3}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}\right)$$

Result (type 5, 109 leaves):

$$\frac{1}{20\,b\,d^2\,\sqrt{a+b\,x}}3\,(c+d\,x)^{1/6}\,\left(d\,(a+b\,x)\,(3\,a\,d+b\,(c+4\,d\,x))-\right.$$

$$\left.3\,(b\,c-a\,d)^2\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\,\text{Hypergeometric2F1}\left[\frac{1}{6},\,\frac{1}{2},\,\frac{7}{6},\,\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)$$

Problem 1739: Result unnecessarily involves higher level functions.

$$\int\frac{(c+d\,x)^{1/6}}{\sqrt{a+b\,x}}\,dx$$

Optimal (type 4, 375 leaves, 3 steps):

$$\frac{3\sqrt{a+b x}\,(c+d x)^{1/6}}{2 b}+\left(3^{3/4}\,(b c-a d)^{2/3}\,(c+d x)^{1/6}\left((b c-a d)^{1/3}-b^{1/3}\,(c+d x)^{1/3}\right)\sqrt{\frac{(b c-a d)^{2/3}+b^{1/3}\,(b c-a d)^{1/3}\,(c+d x)^{1/3}+b^{2/3}\,(c+d x)^{2/3}}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d x)^{1/3}\right)^2}}\;\text{EllipticF}\left[\text{ArcCos}\left[\frac{(b c-a d)^{1/3}-\left(1-\sqrt{3}\right)\,b^{1/3}\,(c+d x)^{1/3}}{(b c-a d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d x)^{1/3}}\right],\frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\Bigg/\left(4 b d\sqrt{a+b x}\,\sqrt{-\frac{b^{1/3}\,(c+d x)^{1/3}\left((b c-a d)^{1/3}-b^{1/3}\,(c+d x)^{1/3}\right)}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d x)^{1/3}\right)^2}}\right)$$

Result (type 5, 93 leaves):

$$\frac{1}{2 b d\sqrt{a+b x}}\,3\,(c+d x)^{1/6}\left(d\,(a+b x)+(b c-a d)\sqrt{\frac{d\,(a+b x)}{-b c+a d}}\;\text{Hypergeometric2F1}\left[\frac{1}{6},\frac{1}{2},\frac{7}{6},\frac{b\,(c+d x)}{b c-a d}\right]\right)$$

Problem 1740: Result unnecessarily involves higher level functions.

$$\int\frac{(c+d x)^{1/6}}{(a+b x)^{3/2}}\,dx$$

Optimal (type 4, 367 leaves, 3 steps):

$$-\frac{2\,(c+d x)^{1/6}}{b\sqrt{a+b x}}+\left((c+d x)^{1/6}\left((b c-a d)^{1/3}-b^{1/3}\,(c+d x)^{1/3}\right)\sqrt{\frac{(b c-a d)^{2/3}+b^{1/3}\,(b c-a d)^{1/3}\,(c+d x)^{1/3}+b^{2/3}\,(c+d x)^{2/3}}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d x)^{1/3}\right)^2}}\;\text{EllipticF}\left[\text{ArcCos}\left[\frac{(b c-a d)^{1/3}-\left(1-\sqrt{3}\right)\,b^{1/3}\,(c+d x)^{1/3}}{(b c-a d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d x)^{1/3}}\right],\frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\Bigg/\left(3^{1/4}\,b\,(b c-a d)^{1/3}\sqrt{a+b x}\,\sqrt{-\frac{b^{1/3}\,(c+d x)^{1/3}\left((b c-a d)^{1/3}-b^{1/3}\,(c+d x)^{1/3}\right)}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d x)^{1/3}\right)^2}}\right)$$

Result (type 5, 74 leaves):

$$\frac{2\,(c+d\,x)^{1/6}\left(-1+\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\ \text{Hypergeometric2F1}\left[\frac{1}{6},\frac{1}{2},\frac{7}{6},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)}{b\,\sqrt{a+b\,x}}$$

Problem 1741: Result unnecessarily involves higher level functions.

$$\int \frac{(c+d\,x)^{1/6}}{(a+b\,x)^{5/2}}\,dx$$

Optimal (type 4, 409 leaves, 4 steps):

$$-\frac{2\,(c+d\,x)^{1/6}}{3\,b\,(a+b\,x)^{3/2}}-\frac{2\,d\,(c+d\,x)^{1/6}}{9\,b\,(b\,c-a\,d)\,\sqrt{a+b\,x}}-\left(2\,d\,(c+d\,x)^{1/6}\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)\right.$$
$$\sqrt{\frac{(b\,c-a\,d)^{2/3}+b^{1/3}\,(b\,c-a\,d)^{1/3}\,(c+d\,x)^{1/3}+b^{2/3}\,(c+d\,x)^{2/3}}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}$$
$$\left.\text{EllipticF}\left[\text{ArcCos}\left[\frac{(b\,c-a\,d)^{1/3}-\left(1-\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}{(b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}\right],\frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\Big/$$
$$\left(9\times 3^{1/4}\,b\,(b\,c-a\,d)^{4/3}\,\sqrt{a+b\,x}\,\sqrt{-\frac{b^{1/3}\,(c+d\,x)^{1/3}\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}\right)$$

Result (type 5, 104 leaves):

$$\left(2\,(c+d\,x)^{1/6}\right.$$
$$\left.\left(3\,b\,c-2\,a\,d+b\,d\,x+2\,d\,(a+b\,x)\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\ \text{Hypergeometric2F1}\left[\frac{1}{6},\frac{1}{2},\frac{7}{6},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\right)\Big/$$
$$\left(9\,b\,(-b\,c+a\,d)\,(a+b\,x)^{3/2}\right)$$

Problem 1742: Result unnecessarily involves higher level functions.

$$\int (a+b\,x)^{3/2}\,(c+d\,x)^{5/6}\,dx$$

Optimal (type 4, 896 leaves, 7 steps):

$$-\frac{27\,(b\,c-a\,d)^2\,\sqrt{a+b\,x}\,(c+d\,x)^{5/6}}{224\,b\,d^2}+\frac{3\,(b\,c-a\,d)\,(a+b\,x)^{3/2}\,(c+d\,x)^{5/6}}{28\,b\,d}+$$

$$\frac{3\,(a+b\,x)^{5/2}\,(c+d\,x)^{5/6}}{10\,b}-\frac{81\,\left(1+\sqrt{3}\right)\,(b\,c-a\,d)^3\,\sqrt{a+b\,x}\,(c+d\,x)^{1/6}}{448\,b^{5/3}\,d^2\,\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)}-$$

$$\left(81\times 3^{1/4}\,(b\,c-a\,d)^{10/3}\,(c+d\,x)^{1/6}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)\right.$$

$$\sqrt{\frac{(b\,c-a\,d)^{2/3}+b^{1/3}\,(b\,c-a\,d)^{1/3}\,(c+d\,x)^{1/3}+b^{2/3}\,(c+d\,x)^{2/3}}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}$$

$$\left.\text{EllipticE}\left[\text{ArcCos}\left[\frac{(b\,c-a\,d)^{1/3}-\left(1-\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}{(b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}\right],\,\frac{1}{4}\,\left(2+\sqrt{3}\right)\right]\right)\Big/$$

$$\left(448\,b^{5/3}\,d^3\,\sqrt{a+b\,x}\,\sqrt{-\frac{b^{1/3}\,(c+d\,x)^{1/3}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}\right)-$$

$$\left(27\times 3^{3/4}\,\left(1-\sqrt{3}\right)\,(b\,c-a\,d)^{10/3}\,(c+d\,x)^{1/6}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)\right.$$

$$\sqrt{\frac{(b\,c-a\,d)^{2/3}+b^{1/3}\,(b\,c-a\,d)^{1/3}\,(c+d\,x)^{1/3}+b^{2/3}\,(c+d\,x)^{2/3}}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}$$

$$\left.\text{EllipticF}\left[\text{ArcCos}\left[\frac{(b\,c-a\,d)^{1/3}-\left(1-\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}{(b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}\right],\,\frac{1}{4}\,\left(2+\sqrt{3}\right)\right]\right)\Big/$$

$$\left(896\,b^{5/3}\,d^3\,\sqrt{a+b\,x}\,\sqrt{-\frac{b^{1/3}\,(c+d\,x)^{1/3}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}\right)$$

Result (type 5, 142 leaves) :

$$-\left(\left(3\,(c+d\,x)^{5/6}\left(-d\,(a+b\,x)\,\left(27\,a^2\,d^2+2\,a\,b\,d\,(65\,c+92\,d\,x)+b^2\,\left(-45\,c^2+40\,c\,d\,x+112\,d^2\,x^2\right)\right)-27\,(b\,c-a\,d)^3\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\;\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{5}{6},\frac{11}{6},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\right)\Big/\left(1120\,b\,d^3\,\sqrt{a+b\,x}\right)\right)$$

Problem 1743: Result unnecessarily involves higher level functions.

$$\int\sqrt{a+b\,x}\;(c+d\,x)^{5/6}\,dx$$

Optimal (type 4, 858 leaves, 6 steps):

$$\frac{15\,(b\,c-a\,d)\,\sqrt{a+b\,x}\,(c+d\,x)^{5/6}}{56\,b\,d}+\frac{3\,(a+b\,x)^{3/2}\,(c+d\,x)^{5/6}}{7\,b}+$$

$$\frac{45\,\left(1+\sqrt{3}\right)\,(b\,c-a\,d)^2\,\sqrt{a+b\,x}\,(c+d\,x)^{1/6}}{112\,b^{5/3}\,d\,\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)}+$$

$$\left(45\times 3^{1/4}\,(b\,c-a\,d)^{7/3}\,(c+d\,x)^{1/6}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)\right.$$

$$\sqrt{\frac{(b\,c-a\,d)^{2/3}+b^{1/3}\,(b\,c-a\,d)^{1/3}\,(c+d\,x)^{1/3}+b^{2/3}\,(c+d\,x)^{2/3}}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}$$

$$\left.\text{EllipticE}\left[\text{ArcCos}\left[\frac{(b\,c-a\,d)^{1/3}-\left(1-\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}{(b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}\right],\,\frac{1}{4}\,\left(2+\sqrt{3}\right)\right]\right)\Big/$$

$$\left(112\,b^{5/3}\,d^2\,\sqrt{a+b\,x}\,\sqrt{-\frac{b^{1/3}\,(c+d\,x)^{1/3}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}\right)+$$

$$\left(15\times 3^{3/4}\,\left(1-\sqrt{3}\right)\,(b\,c-a\,d)^{7/3}\,(c+d\,x)^{1/6}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)\right.$$

$$\sqrt{\frac{(b\,c-a\,d)^{2/3}+b^{1/3}\,(b\,c-a\,d)^{1/3}\,(c+d\,x)^{1/3}+b^{2/3}\,(c+d\,x)^{2/3}}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}$$

$$\left.\text{EllipticF}\left[\text{ArcCos}\left[\frac{(b\,c-a\,d)^{1/3}-\left(1-\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}{(b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}\right],\,\frac{1}{4}\,\left(2+\sqrt{3}\right)\right]\right)\Big/$$

$$\left(224\,b^{5/3}\,d^2\,\sqrt{a+b\,x}\,\sqrt{-\frac{b^{1/3}\,(c+d\,x)^{1/3}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}\right)$$

Result (type 5, 110 leaves):

$$\frac{1}{56\,b\,d^2\,\sqrt{a+b\,x}}3\,(c+d\,x)^{5/6}\,\left(d\,(a+b\,x)\,(5\,b\,c+3\,a\,d+8\,b\,d\,x)-\right.$$

$$\left.3\,(b\,c-a\,d)^2\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\,\frac{5}{6},\,\frac{11}{6},\,\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)$$

Problem 1744: Result unnecessarily involves higher level functions.

$$\int \frac{(c+d x)^{5/6}}{\sqrt{a+b x}}\, dx$$

Optimal (type 4, 817 leaves, 5 steps):

$$\frac{3 \sqrt{a+b x}\, (c+d x)^{5/6}}{4 b}-\frac{15 \left(1+\sqrt{3}\right) (b c-a d) \sqrt{a+b x}\, (c+d x)^{1/6}}{8 b^{5/3} \left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}\right)}-$$

$$\left(15\times 3^{1/4} (b c-a d)^{4/3} (c+d x)^{1/6} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)\right.$$

$$\sqrt{\frac{(b c-a d)^{2/3}+b^{1/3} (b c-a d)^{1/3} (c+d x)^{1/3}+b^{2/3} (c+d x)^{2/3}}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}\right)^2}}$$

$$\left.\text{EllipticE}\left[\text{ArcCos}\left[\frac{(b c-a d)^{1/3}-\left(1-\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}}{(b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}}\right], \frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\Bigg/$$

$$\left(8 b^{5/3} d \sqrt{a+b x} \sqrt{-\frac{b^{1/3} (c+d x)^{1/3} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}\right)^2}}\right)-$$

$$\left(5\times 3^{3/4} \left(1-\sqrt{3}\right) (b c-a d)^{4/3} (c+d x)^{1/6} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)\right.$$

$$\sqrt{\frac{(b c-a d)^{2/3}+b^{1/3} (b c-a d)^{1/3} (c+d x)^{1/3}+b^{2/3} (c+d x)^{2/3}}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}\right)^2}}$$

$$\left.\text{EllipticF}\left[\text{ArcCos}\left[\frac{(b c-a d)^{1/3}-\left(1-\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}}{(b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}}\right], \frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\Bigg/$$

$$\left(16 b^{5/3} d \sqrt{a+b x} \sqrt{-\frac{b^{1/3} (c+d x)^{1/3} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}\right)^2}}\right)$$

Result (type 5, 93 leaves):

$$\frac{1}{4\,b\,d\,\sqrt{a+b\,x}}$$

$$3\,(c+d\,x)^{5/6}\left(d\,(a+b\,x)+(b\,c-a\,d)\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\;\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{5}{6},\frac{11}{6},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)$$

Problem 1745: Result unnecessarily involves higher level functions.

$$\int \frac{(c+d\,x)^{5/6}}{(a+b\,x)^{3/2}}\,dx$$

Optimal (type 4, 798 leaves, 5 steps):

$$-\frac{2\,(c+d\,x)^{5/6}}{b\,\sqrt{a+b\,x}}-\frac{5\,\left(1+\sqrt{3}\right)\,d\,\sqrt{a+b\,x}\,(c+d\,x)^{1/6}}{b^{5/3}\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)}-$$

$$\left(5\times 3^{1/4}\,(b\,c-a\,d)^{1/3}\,(c+d\,x)^{1/6}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)\right.$$

$$\sqrt{\frac{(b\,c-a\,d)^{2/3}+b^{1/3}\,(b\,c-a\,d)^{1/3}\,(c+d\,x)^{1/3}+b^{2/3}\,(c+d\,x)^{2/3}}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}$$

$$\left.\text{EllipticE}\left[\text{ArcCos}\left[\frac{(b\,c-a\,d)^{1/3}-\left(1-\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}{(b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}\right],\frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\Bigg/$$

$$\left(b^{5/3}\,\sqrt{a+b\,x}\,\sqrt{-\frac{b^{1/3}\,(c+d\,x)^{1/3}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}\right)-$$

$$\left(5\,\left(1-\sqrt{3}\right)\,(b\,c-a\,d)^{1/3}\,(c+d\,x)^{1/6}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)\right.$$

$$\sqrt{\frac{(b\,c-a\,d)^{2/3}+b^{1/3}\,(b\,c-a\,d)^{1/3}\,(c+d\,x)^{1/3}+b^{2/3}\,(c+d\,x)^{2/3}}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}$$

$$\left.\text{EllipticF}\left[\text{ArcCos}\left[\frac{(b\,c-a\,d)^{1/3}-\left(1-\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}{(b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}\right],\frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\Bigg/$$

$$\left(2\times 3^{1/4}\,b^{5/3}\,\sqrt{a+b\,x}\,\sqrt{-\frac{b^{1/3}\,(c+d\,x)^{1/3}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}\right)$$

Result (type 5, 74 leaves):

$$\frac{2\,(c+d\,x)^{5/6}\left(-1+\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\;\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{5}{6},\frac{11}{6},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)}{b\,\sqrt{a+b\,x}}$$

Problem 1746: Result unnecessarily involves higher level functions.

$$\int\frac{(c+d\,x)^{5/6}}{(a+b\,x)^{5/2}}\,dx$$

Optimal (type 4, 854 leaves, 6 steps):

$$-\frac{2\,(c+d\,x)^{5/6}}{3\,b\,(a+b\,x)^{3/2}}-\frac{10\,d\,(c+d\,x)^{5/6}}{9\,b\,(b\,c-a\,d)\,\sqrt{a+b\,x}}-$$

$$\frac{10\,\left(1+\sqrt{3}\right)\,d^2\,\sqrt{a+b\,x}\,(c+d\,x)^{1/6}}{9\,b^{5/3}\,(b\,c-a\,d)\,\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)}-$$

$$\left(10\,d\,(c+d\,x)^{1/6}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)\right.$$

$$\sqrt{\frac{(b\,c-a\,d)^{2/3}+b^{1/3}\,(b\,c-a\,d)^{1/3}\,(c+d\,x)^{1/3}+b^{2/3}\,(c+d\,x)^{2/3}}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}$$

$$\left.\text{EllipticE}\left[\text{ArcCos}\left[\frac{(b\,c-a\,d)^{1/3}-\left(1-\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}{(b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}\right],\,\frac{1}{4}\,\left(2+\sqrt{3}\right)\right]\right)\Big/$$

$$\left(3\times 3^{3/4}\,b^{5/3}\,(b\,c-a\,d)^{2/3}\,\sqrt{a+b\,x}\,\sqrt{-\frac{b^{1/3}\,(c+d\,x)^{1/3}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}\right)-$$

$$\left(5\,\left(1-\sqrt{3}\right)\,d\,(c+d\,x)^{1/6}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)\right.$$

$$\sqrt{\frac{(b\,c-a\,d)^{2/3}+b^{1/3}\,(b\,c-a\,d)^{1/3}\,(c+d\,x)^{1/3}+b^{2/3}\,(c+d\,x)^{2/3}}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}$$

$$\left.\text{EllipticF}\left[\text{ArcCos}\left[\frac{(b\,c-a\,d)^{1/3}-\left(1-\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}{(b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}\right],\,\frac{1}{4}\,\left(2+\sqrt{3}\right)\right]\right)\Big/$$

$$\left(9\times 3^{1/4}\,b^{5/3}\,(b\,c-a\,d)^{2/3}\,\sqrt{a+b\,x}\,\sqrt{-\frac{b^{1/3}\,(c+d\,x)^{1/3}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}\right)$$

Result (type 5, 105 leaves) :

$$-\left(\left(2\,(c+d\,x)^{5/6}\,\left(3\,b\,c+2\,a\,d+5\,b\,d\,x-2\,d\,(a+b\,x)\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\right.\right.\right.$$

$$\left.\left.\left.\text{Hypergeometric2F1}\left[\frac{1}{2},\,\frac{5}{6},\,\frac{11}{6},\,\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\right)\Big/\left(9\,b\,(b\,c-a\,d)\,(a+b\,x)^{3/2}\right)\right)$$

Problem 1747: Result unnecessarily involves higher level functions.

$$\int \frac{(c+d x)^{5/6}}{(a+b x)^{7/2}} \, dx$$

Optimal (type 4, 896 leaves, 7 steps):

$$-\frac{2 (c+d x)^{5/6}}{5 b (a+b x)^{5/2}}-\frac{2 d (c+d x)^{5/6}}{9 b (b c-a d) (a+b x)^{3/2}}+\frac{8 d^2 (c+d x)^{5/6}}{27 b (b c-a d)^2 \sqrt{a+b x}}+$$

$$\frac{8 \left(1+\sqrt{3}\right) d^3 \sqrt{a+b x} (c+d x)^{1/6}}{27 b^{5/3} (b c-a d)^2 \left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}\right)}+$$

$$\left(8 d^2 (c+d x)^{1/6} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right) \sqrt{\frac{(b c-a d)^{2/3}+b^{1/3} (b c-a d)^{1/3} (c+d x)^{1/3}+b^{2/3} (c+d x)^{2/3}}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}\right)^2}} \text{EllipticE}\left[\text{ArcCos}\left[\frac{(b c-a d)^{1/3}-\left(1-\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}}{(b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}}\right], \frac{1}{4} \left(2+\sqrt{3}\right)\right]\right) \Big/ \left(9\times 3^{3/4} b^{5/3} (b c-a d)^{5/3} \sqrt{a+b x} \sqrt{-\frac{b^{1/3} (c+d x)^{1/3} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}\right)^2}}\right)+$$

$$\left(4 \left(1-\sqrt{3}\right) d^2 (c+d x)^{1/6} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right) \sqrt{\frac{(b c-a d)^{2/3}+b^{1/3} (b c-a d)^{1/3} (c+d x)^{1/3}+b^{2/3} (c+d x)^{2/3}}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}\right)^2}} \text{EllipticF}\left[\text{ArcCos}\left[\frac{(b c-a d)^{1/3}-\left(1-\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}}{(b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}}\right], \frac{1}{4} \left(2+\sqrt{3}\right)\right]\right) \Big/ \left(27\times 3^{1/4} b^{5/3} (b c-a d)^{5/3} \sqrt{a+b x} \sqrt{-\frac{b^{1/3} (c+d x)^{1/3} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}\right)^2}}\right)$$

Result (type 5, 140 leaves):

$$-\left(\left(2\,(c+d\,x)^{5/6}\left(-8\,a^2\,d^2-a\,b\,d\,(39\,c+55\,d\,x)+b^2\,\left(27\,c^2+15\,c\,d\,x-20\,d^2\,x^2\right)+8\,d^2\,(a+b\,x)^2\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\;\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{5}{6},\frac{11}{6},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\right)\Big/\left(135\,b\,(b\,c-a\,d)^2\,(a+b\,x)^{5/2}\right)\right)$$

Problem 1748: Result unnecessarily involves higher level functions.

$$\int \frac{(a+b\,x)^{5/2}}{(c+d\,x)^{1/6}}\,dx$$

Optimal (type 4, 890 leaves, 7 steps):

$$\frac{81\,(b\,c-a\,d)^2\,\sqrt{a+b\,x}\,(c+d\,x)^{5/6}}{224\,d^3}-\frac{9\,(b\,c-a\,d)\,(a+b\,x)^{3/2}\,(c+d\,x)^{5/6}}{28\,d^2}+$$

$$\frac{3\,(a+b\,x)^{5/2}\,(c+d\,x)^{5/6}}{10\,d}+\frac{243\,\left(1+\sqrt{3}\right)\,(b\,c-a\,d)^3\,\sqrt{a+b\,x}\,(c+d\,x)^{1/6}}{448\,b^{2/3}\,d^3\,\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)}+$$

$$\left(243\times 3^{1/4}\,(b\,c-a\,d)^{10/3}\,(c+d\,x)^{1/6}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)\right.$$

$$\sqrt{\frac{(b\,c-a\,d)^{2/3}+b^{1/3}\,(b\,c-a\,d)^{1/3}\,(c+d\,x)^{1/3}+b^{2/3}\,(c+d\,x)^{2/3}}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}$$

$$\left.\text{EllipticE}\left[\text{ArcCos}\left[\frac{(b\,c-a\,d)^{1/3}-\left(1-\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}{(b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}\right],\,\frac{1}{4}\,\left(2+\sqrt{3}\right)\right]\right)\Big/$$

$$\left(448\,b^{2/3}\,d^4\,\sqrt{a+b\,x}\,\sqrt{-\frac{b^{1/3}\,(c+d\,x)^{1/3}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}\right)+$$

$$\left(81\times 3^{3/4}\,\left(1-\sqrt{3}\right)\,(b\,c-a\,d)^{10/3}\,(c+d\,x)^{1/6}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)\right.$$

$$\sqrt{\frac{(b\,c-a\,d)^{2/3}+b^{1/3}\,(b\,c-a\,d)^{1/3}\,(c+d\,x)^{1/3}+b^{2/3}\,(c+d\,x)^{2/3}}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}$$

$$\left.\text{EllipticF}\left[\text{ArcCos}\left[\frac{(b\,c-a\,d)^{1/3}-\left(1-\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}{(b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}\right],\,\frac{1}{4}\,\left(2+\sqrt{3}\right)\right]\right)\Big/$$

$$\left(896\,b^{2/3}\,d^4\,\sqrt{a+b\,x}\,\sqrt{-\frac{b^{1/3}\,(c+d\,x)^{1/3}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}\right)$$

Result (type 5, 138 leaves):

$$\frac{1}{1120\,d^4\,\sqrt{a+b\,x}}$$

$$3\,(c+d\,x)^{5/6}\,\left(d\,(a+b\,x)\,\left(367\,a^2\,d^2+2\,a\,b\,d\,(-195\,c+172\,d\,x)+b^2\,\left(135\,c^2-120\,c\,d\,x+112\,d^2\,x^2\right)\right)-\right.$$

$$\left.81\,(b\,c-a\,d)^3\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\,\frac{5}{6},\,\frac{11}{6},\,\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)$$

Problem 1749: Result unnecessarily involves higher level functions.

$$\int \frac{(a+b x)^{3/2}}{(c+d x)^{1/6}} \, dx$$

Optimal (type 4, 855 leaves, 6 steps):

$$-\frac{27 (b c-a d) \sqrt{a+b x} (c+d x)^{5/6}}{56 d^2}+\frac{3 (a+b x)^{3/2} (c+d x)^{5/6}}{7 d}-\frac{81 \left(1+\sqrt{3}\right) (b c-a d)^2 \sqrt{a+b x} (c+d x)^{1/6}}{112 b^{2/3} d^2 \left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}\right)}-$$

$$\left(81\times 3^{1/4} (b c-a d)^{7/3} (c+d x)^{1/6} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right) \sqrt{\frac{(b c-a d)^{2/3}+b^{1/3} (b c-a d)^{1/3} (c+d x)^{1/3}+b^{2/3} (c+d x)^{2/3}}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcCos}\left[\frac{(b c-a d)^{1/3}-\left(1-\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}}{(b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}}\right], \frac{1}{4} \left(2+\sqrt{3}\right)\right]\right)\Big/$$

$$\left(112 b^{2/3} d^3 \sqrt{a+b x} \sqrt{-\frac{b^{1/3} (c+d x)^{1/3} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}\right)^2}}\right)-$$

$$\left(27\times 3^{3/4} \left(1-\sqrt{3}\right) (b c-a d)^{7/3} (c+d x)^{1/6} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right) \sqrt{\frac{(b c-a d)^{2/3}+b^{1/3} (b c-a d)^{1/3} (c+d x)^{1/3}+b^{2/3} (c+d x)^{2/3}}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcCos}\left[\frac{(b c-a d)^{1/3}-\left(1-\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}}{(b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}}\right], \frac{1}{4} \left(2+\sqrt{3}\right)\right]\right)\Big/$$

$$\left(224 b^{2/3} d^3 \sqrt{a+b x} \sqrt{-\frac{b^{1/3} (c+d x)^{1/3} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}\right)^2}}\right)$$

Result (type 5, 108 leaves):

$$\frac{1}{280\, d^3 \sqrt{a+b\,x}} 3\, (c+d\,x)^{5/6} \left(5\, d\, (a+b\,x)\, (-9\, b\, c+17\, a\, d+8\, b\, d\, x) + 27\, (b\, c-a\, d)^2 \sqrt{\frac{d\, (a+b\,x)}{-b\, c+a\, d}}\, \text{Hypergeometric2F1}\left[\frac{1}{2}, \frac{5}{6}, \frac{11}{6}, \frac{b\, (c+d\,x)}{b\, c-a\, d}\right]\right)$$

Problem 1750: Result unnecessarily involves higher level functions.

$$\int \frac{\sqrt{a+b\,x}}{(c+d\,x)^{1/6}}\, dx$$

Optimal (type 4, 820 leaves, 5 steps):

$$\frac{3\sqrt{a+bx}\ (c+dx)^{5/6}}{4d}+\frac{9\left(1+\sqrt{3}\right)(bc-ad)\sqrt{a+bx}\ (c+dx)^{1/6}}{8b^{2/3}d\left((bc-ad)^{1/3}-\left(1+\sqrt{3}\right)b^{1/3}(c+dx)^{1/3}\right)}+$$

$$\left(9\times3^{1/4}(bc-ad)^{4/3}(c+dx)^{1/6}\left((bc-ad)^{1/3}-b^{1/3}(c+dx)^{1/3}\right)\right.$$

$$\sqrt{\frac{(bc-ad)^{2/3}+b^{1/3}(bc-ad)^{1/3}(c+dx)^{1/3}+b^{2/3}(c+dx)^{2/3}}{\left((bc-ad)^{1/3}-\left(1+\sqrt{3}\right)b^{1/3}(c+dx)^{1/3}\right)^2}}$$

$$\left.\text{EllipticE}\left[\text{ArcCos}\left[\frac{(bc-ad)^{1/3}-\left(1-\sqrt{3}\right)b^{1/3}(c+dx)^{1/3}}{(bc-ad)^{1/3}-\left(1+\sqrt{3}\right)b^{1/3}(c+dx)^{1/3}}\right],\frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\Big/$$

$$\left(8b^{2/3}d^2\sqrt{a+bx}\sqrt{-\frac{b^{1/3}(c+dx)^{1/3}\left((bc-ad)^{1/3}-b^{1/3}(c+dx)^{1/3}\right)}{\left((bc-ad)^{1/3}-\left(1+\sqrt{3}\right)b^{1/3}(c+dx)^{1/3}\right)^2}}\right)+$$

$$\left(3\times3^{3/4}\left(1-\sqrt{3}\right)(bc-ad)^{4/3}(c+dx)^{1/6}\left((bc-ad)^{1/3}-b^{1/3}(c+dx)^{1/3}\right)\right.$$

$$\sqrt{\frac{(bc-ad)^{2/3}+b^{1/3}(bc-ad)^{1/3}(c+dx)^{1/3}+b^{2/3}(c+dx)^{2/3}}{\left((bc-ad)^{1/3}-\left(1+\sqrt{3}\right)b^{1/3}(c+dx)^{1/3}\right)^2}}$$

$$\left.\text{EllipticF}\left[\text{ArcCos}\left[\frac{(bc-ad)^{1/3}-\left(1-\sqrt{3}\right)b^{1/3}(c+dx)^{1/3}}{(bc-ad)^{1/3}-\left(1+\sqrt{3}\right)b^{1/3}(c+dx)^{1/3}}\right],\frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\Big/$$

$$\left(16b^{2/3}d^2\sqrt{a+bx}\sqrt{-\frac{b^{1/3}(c+dx)^{1/3}\left((bc-ad)^{1/3}-b^{1/3}(c+dx)^{1/3}\right)}{\left((bc-ad)^{1/3}-\left(1+\sqrt{3}\right)b^{1/3}(c+dx)^{1/3}\right)^2}}\right)$$

Result (type 5, 77 leaves) :

$$\frac{3\sqrt{a+bx}\ (c+dx)^{5/6}\left(5+\frac{3\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{5}{6},\frac{11}{6},\frac{b(c+dx)}{bc-ad}\right]}{\sqrt{\frac{d(a+bx)}{-bc+ad}}}\right)}{20d}$$

Problem 1751: Result unnecessarily involves higher level functions.

$$\int\frac{1}{\sqrt{a+bx}\ (c+dx)^{1/6}}\,dx$$

Optimal (type 4, 780 leaves, 4 steps) :

$$-\frac{3\left(1+\sqrt{3}\right)\sqrt{a+b x}\,(c+d x)^{1/6}}{b^{2/3}\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right)b^{1/3}(c+d x)^{1/3}\right)}-$$

$$\left(3\times 3^{1/4}(b c-a d)^{1/3}(c+d x)^{1/6}\left((b c-a d)^{1/3}-b^{1/3}(c+d x)^{1/3}\right)\right.$$

$$\sqrt{\frac{(b c-a d)^{2/3}+b^{1/3}(b c-a d)^{1/3}(c+d x)^{1/3}+b^{2/3}(c+d x)^{2/3}}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right)b^{1/3}(c+d x)^{1/3}\right)^2}}$$

$$\left.\text{EllipticE}\left[\text{ArcCos}\left[\frac{(b c-a d)^{1/3}-\left(1-\sqrt{3}\right)b^{1/3}(c+d x)^{1/3}}{(b c-a d)^{1/3}-\left(1+\sqrt{3}\right)b^{1/3}(c+d x)^{1/3}}\right],\frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\Bigg/$$

$$\left(b^{2/3}d\sqrt{a+b x}\sqrt{-\frac{b^{1/3}(c+d x)^{1/3}\left((b c-a d)^{1/3}-b^{1/3}(c+d x)^{1/3}\right)}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right)b^{1/3}(c+d x)^{1/3}\right)^2}}\right)-$$

$$\left(3^{3/4}\left(1-\sqrt{3}\right)(b c-a d)^{1/3}(c+d x)^{1/6}\left((b c-a d)^{1/3}-b^{1/3}(c+d x)^{1/3}\right)\right.$$

$$\sqrt{\frac{(b c-a d)^{2/3}+b^{1/3}(b c-a d)^{1/3}(c+d x)^{1/3}+b^{2/3}(c+d x)^{2/3}}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right)b^{1/3}(c+d x)^{1/3}\right)^2}}$$

$$\left.\text{EllipticF}\left[\text{ArcCos}\left[\frac{(b c-a d)^{1/3}-\left(1-\sqrt{3}\right)b^{1/3}(c+d x)^{1/3}}{(b c-a d)^{1/3}-\left(1+\sqrt{3}\right)b^{1/3}(c+d x)^{1/3}}\right],\frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\Bigg/$$

$$\left(2\,b^{2/3}d\sqrt{a+b x}\sqrt{-\frac{b^{1/3}(c+d x)^{1/3}\left((b c-a d)^{1/3}-b^{1/3}(c+d x)^{1/3}\right)}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right)b^{1/3}(c+d x)^{1/3}\right)^2}}\right)$$

Result (type 5, 73 leaves):

$$\frac{6\sqrt{\frac{d(a+b x)}{-b c+a d}}\,(c+d x)^{5/6}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{5}{6},\frac{11}{6},\frac{b(c+d x)}{b c-a d}\right]}{5 d\sqrt{a+b x}}$$

Problem 1752: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(a+b x)^{3/2}(c+d x)^{1/6}}\,dx$$

Optimal (type 4, 813 leaves, 5 steps):

$$-\frac{2\,(c+d\,x)^{5/6}}{(b\,c-a\,d)\,\sqrt{a+b\,x}}-\frac{2\,\left(1+\sqrt{3}\right)\,d\,\sqrt{a+b\,x}\,\,(c+d\,x)^{1/6}}{b^{2/3}\,(b\,c-a\,d)\,\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)}-$$

$$\left(2\times 3^{1/4}\,(c+d\,x)^{1/6}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)\right.$$

$$\sqrt{\frac{(b\,c-a\,d)^{2/3}+b^{1/3}\,(b\,c-a\,d)^{1/3}\,(c+d\,x)^{1/3}+b^{2/3}\,(c+d\,x)^{2/3}}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}$$

$$\left.\text{EllipticE}\left[\text{ArcCos}\left[\frac{(b\,c-a\,d)^{1/3}-\left(1-\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}{(b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}\right],\,\frac{1}{4}\,\left(2+\sqrt{3}\right)\right]\right)\Big/$$

$$\left(b^{2/3}\,(b\,c-a\,d)^{2/3}\,\sqrt{a+b\,x}\,\sqrt{-\frac{b^{1/3}\,(c+d\,x)^{1/3}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}\right)-$$

$$\left(\left(1-\sqrt{3}\right)\,(c+d\,x)^{1/6}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)\right.$$

$$\sqrt{\frac{(b\,c-a\,d)^{2/3}+b^{1/3}\,(b\,c-a\,d)^{1/3}\,(c+d\,x)^{1/3}+b^{2/3}\,(c+d\,x)^{2/3}}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}$$

$$\left.\text{EllipticF}\left[\text{ArcCos}\left[\frac{(b\,c-a\,d)^{1/3}-\left(1-\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}{(b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}\right],\,\frac{1}{4}\,\left(2+\sqrt{3}\right)\right]\right)\Big/$$

$$\left(3^{1/4}\,b^{2/3}\,(b\,c-a\,d)^{2/3}\,\sqrt{a+b\,x}\,\sqrt{-\frac{b^{1/3}\,(c+d\,x)^{1/3}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}\right)$$

Result (type 5, 84 leaves):

$$\left(2\,(c+d\,x)^{5/6}\,\left(-5+2\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\,\,\text{Hypergeometric2F1}\left[\frac{1}{2},\,\frac{5}{6},\,\frac{11}{6},\,\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\right)\Big/$$

$$\left(5\,(b\,c-a\,d)\,\sqrt{a+b\,x}\right)$$

Problem 1753: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(a+b\,x)^{5/2}\,(c+d\,x)^{1/6}}\,dx$$

Optimal (type 4, 858 leaves, 6 steps):

$$-\frac{2\,(c+d\,x)^{5/6}}{3\,(b\,c-a\,d)\,(a+b\,x)^{3/2}}+\frac{8\,d\,(c+d\,x)^{5/6}}{9\,(b\,c-a\,d)^2\,\sqrt{a+b\,x}}+\frac{8\,\left(1+\sqrt{3}\right)\,d^2\,\sqrt{a+b\,x}\,(c+d\,x)^{1/6}}{9\,b^{2/3}\,(b\,c-a\,d)^2\,\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)}+$$

$$\left(8\,d\,(c+d\,x)^{1/6}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)\right.$$
$$\sqrt{\frac{(b\,c-a\,d)^{2/3}+b^{1/3}\,(b\,c-a\,d)^{1/3}\,(c+d\,x)^{1/3}+b^{2/3}\,(c+d\,x)^{2/3}}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}$$
$$\left.\text{EllipticE}\left[\text{ArcCos}\left[\frac{(b\,c-a\,d)^{1/3}-\left(1-\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}{(b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}\right],\,\frac{1}{4}\,\left(2+\sqrt{3}\right)\right]\right)\Big/$$
$$\left(3\times 3^{3/4}\,b^{2/3}\,(b\,c-a\,d)^{5/3}\,\sqrt{a+b\,x}\,\sqrt{-\frac{b^{1/3}\,(c+d\,x)^{1/3}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}\right)+$$

$$\left(4\,\left(1-\sqrt{3}\right)\,d\,(c+d\,x)^{1/6}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)\right.$$
$$\sqrt{\frac{(b\,c-a\,d)^{2/3}+b^{1/3}\,(b\,c-a\,d)^{1/3}\,(c+d\,x)^{1/3}+b^{2/3}\,(c+d\,x)^{2/3}}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}$$
$$\left.\text{EllipticF}\left[\text{ArcCos}\left[\frac{(b\,c-a\,d)^{1/3}-\left(1-\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}{(b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}\right],\,\frac{1}{4}\,\left(2+\sqrt{3}\right)\right]\right)\Big/$$
$$\left(9\times 3^{1/4}\,b^{2/3}\,(b\,c-a\,d)^{5/3}\,\sqrt{a+b\,x}\,\sqrt{-\frac{b^{1/3}\,(c+d\,x)^{1/3}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}\right)$$

Result (type 5, 105 leaves) :

$$-\left(\left(2\,(c+d\,x)^{5/6}\,\left(-5\,(-3\,b\,c+7\,a\,d+4\,b\,d\,x)+8\,d\,(a+b\,x)\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\right.\right.\right.$$
$$\left.\left.\left.\text{Hypergeometric2F1}\left[\frac{1}{2},\,\frac{5}{6},\,\frac{11}{6},\,\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\right)\Big/\left(45\,(b\,c-a\,d)^2\,(a+b\,x)^{3/2}\right)\right)$$

Problem 1754: Result unnecessarily involves higher level functions.

$$\int \frac{(a+b x)^{5/2}}{(c+d x)^{5/6}}\, dx$$

Optimal (type 4, 440 leaves, 5 steps):

$$\frac{81 (b c-a d)^2 \sqrt{a+b x}\, (c+d x)^{1/6}}{64 d^3}-\frac{9 (b c-a d) (a+b x)^{3/2} (c+d x)^{1/6}}{16 d^2}+\frac{3 (a+b x)^{5/2} (c+d x)^{1/6}}{8 d}-\left(81\times 3^{3/4} (b c-a d)^{8/3} (c+d x)^{1/6} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right) \sqrt{\frac{(b c-a d)^{2/3}+b^{1/3} (b c-a d)^{1/3} (c+d x)^{1/3}+b^{2/3} (c+d x)^{2/3}}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}\right)^2}}\ \text{EllipticF}\left[\text{ArcCos}\left[\frac{(b c-a d)^{1/3}-\left(1-\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}}{(b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}}\right], \frac{1}{4} \left(2+\sqrt{3}\right)\right]\right) \Bigg/ \left(128 d^4 \sqrt{a+b x} \sqrt{-\frac{b^{1/3} (c+d x)^{1/3} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}\right)^2}}\right)$$

Result (type 5, 138 leaves):

$$\frac{1}{64 d^4 \sqrt{a+b x}} 3 (c+d x)^{1/6} \left(d (a+b x) \left(47 a^2 d^2+2 a b d (-33 c+14 d x)+b^2 \left(27 c^2-12 c d x+8 d^2 x^2\right)\right)-81 (b c-a d)^3 \sqrt{\frac{d (a+b x)}{-b c+a d}}\ \text{Hypergeometric2F1}\left[\frac{1}{6}, \frac{1}{2}, \frac{7}{6}, \frac{b (c+d x)}{b c-a d}\right]\right)$$

Problem 1755: Result unnecessarily involves higher level functions.

$$\int \frac{(a+b x)^{3/2}}{(c+d x)^{5/6}}\, dx$$

Optimal (type 4, 405 leaves, 4 steps):

$$-\frac{27\,(b\,c-a\,d)\,\sqrt{a+b\,x}\,(c+d\,x)^{1/6}}{20\,d^2}+\frac{3\,(a+b\,x)^{3/2}\,(c+d\,x)^{1/6}}{5\,d}+$$

$$\left(27\times 3^{3/4}\,(b\,c-a\,d)^{5/3}\,(c+d\,x)^{1/6}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)\right.$$

$$\sqrt{\frac{(b\,c-a\,d)^{2/3}+b^{1/3}\,(b\,c-a\,d)^{1/3}\,(c+d\,x)^{1/3}+b^{2/3}\,(c+d\,x)^{2/3}}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}$$

$$\left.\text{EllipticF}\left[\text{ArcCos}\left[\frac{(b\,c-a\,d)^{1/3}-\left(1-\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}{(b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}\right],\frac{1}{4}\,\left(2+\sqrt{3}\right)\right]\right)\Big/$$

$$\left(40\,d^3\,\sqrt{a+b\,x}\,\sqrt{-\frac{b^{1/3}\,(c+d\,x)^{1/3}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}\right)$$

Result (type 5, 107 leaves):

$$\frac{1}{20\,d^3\,\sqrt{a+b\,x}}3\,(c+d\,x)^{1/6}\,\left(d\,(a+b\,x)\,(-9\,b\,c+13\,a\,d+4\,b\,d\,x)+\right.$$

$$\left.27\,(b\,c-a\,d)^2\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\,\text{Hypergeometric2F1}\left[\frac{1}{6},\frac{1}{2},\frac{7}{6},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)$$

Problem 1756: Result unnecessarily involves higher level functions.

$$\int\frac{\sqrt{a+b\,x}}{(c+d\,x)^{5/6}}\,dx$$

Optimal (type 4, 372 leaves, 3 steps):

$$\frac{3\sqrt{a+bx}\,(c+dx)^{1/6}}{2d}-\left(3\times 3^{3/4}\,(bc-ad)^{2/3}\,(c+dx)^{1/6}\left((bc-ad)^{1/3}-b^{1/3}\,(c+dx)^{1/3}\right)\sqrt{\frac{(bc-ad)^{2/3}+b^{1/3}\,(bc-ad)^{1/3}\,(c+dx)^{1/3}+b^{2/3}\,(c+dx)^{2/3}}{\left((bc-ad)^{1/3}-\left(1+\sqrt{3}\right)b^{1/3}\,(c+dx)^{1/3}\right)^2}}\ \text{EllipticF}\left[\text{ArcCos}\left[\frac{(bc-ad)^{1/3}-\left(1-\sqrt{3}\right)b^{1/3}\,(c+dx)^{1/3}}{(bc-ad)^{1/3}-\left(1+\sqrt{3}\right)b^{1/3}\,(c+dx)^{1/3}}\right],\frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\Bigg/\left(4d^2\sqrt{a+bx}\sqrt{-\frac{b^{1/3}\,(c+dx)^{1/3}\left((bc-ad)^{1/3}-b^{1/3}\,(c+dx)^{1/3}\right)}{\left((bc-ad)^{1/3}-\left(1+\sqrt{3}\right)b^{1/3}\,(c+dx)^{1/3}\right)^2}}\right)$$

Result (type 5, 77 leaves):

$$\frac{3\sqrt{a+bx}\,(c+dx)^{1/6}\left(1+\frac{3\,\text{Hypergeometric2F1}\left[\frac{1}{6},\frac{1}{2},\frac{7}{6},\frac{b(c+dx)}{bc-ad}\right]}{\sqrt{\frac{d(a+bx)}{-bc+ad}}}\right)}{2d}$$

Problem 1757: Result unnecessarily involves higher level functions.

$$\int\frac{1}{\sqrt{a+bx}\,(c+dx)^{5/6}}\,dx$$

Optimal (type 4, 343 leaves, 2 steps):

$$\left(3^{3/4}\,(c+dx)^{1/6}\left((bc-ad)^{1/3}-b^{1/3}\,(c+dx)^{1/3}\right)\sqrt{\frac{(bc-ad)^{2/3}+b^{1/3}\,(bc-ad)^{1/3}\,(c+dx)^{1/3}+b^{2/3}\,(c+dx)^{2/3}}{\left((bc-ad)^{1/3}-\left(1+\sqrt{3}\right)b^{1/3}\,(c+dx)^{1/3}\right)^2}}\ \text{EllipticF}\left[\text{ArcCos}\left[\frac{(bc-ad)^{1/3}-\left(1-\sqrt{3}\right)b^{1/3}\,(c+dx)^{1/3}}{(bc-ad)^{1/3}-\left(1+\sqrt{3}\right)b^{1/3}\,(c+dx)^{1/3}}\right],\frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\Bigg/\left(d\,(bc-ad)^{1/3}\sqrt{a+bx}\sqrt{-\frac{b^{1/3}\,(c+dx)^{1/3}\left((bc-ad)^{1/3}-b^{1/3}\,(c+dx)^{1/3}\right)}{\left((bc-ad)^{1/3}-\left(1+\sqrt{3}\right)b^{1/3}\,(c+dx)^{1/3}\right)^2}}\right)$$

Result (type 5, 71 leaves):

$$\frac{6\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\;(c+d\,x)^{1/6}\,\text{Hypergeometric2F1}\left[\frac{1}{6},\frac{1}{2},\frac{7}{6},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]}{d\,\sqrt{a+b\,x}}$$

Problem 1758: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a+b\,x)^{3/2}\,(c+d\,x)^{5/6}}\,dx$$

Optimal (type 4, 372 leaves, 3 steps):

$$-\frac{2\,(c+d\,x)^{1/6}}{(b\,c-a\,d)\,\sqrt{a+b\,x}}-\left(2\,(c+d\,x)^{1/6}\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)\right.$$
$$\sqrt{\frac{(b\,c-a\,d)^{2/3}+b^{1/3}\,(b\,c-a\,d)^{1/3}\,(c+d\,x)^{1/3}+b^{2/3}\,(c+d\,x)^{2/3}}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}$$
$$\left.\text{EllipticF}\left[\text{ArcCos}\left[\frac{(b\,c-a\,d)^{1/3}-\left(1-\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}{(b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}\right],\frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\Bigg/$$
$$\left(3^{1/4}\,(b\,c-a\,d)^{4/3}\,\sqrt{a+b\,x}\,\sqrt{-\frac{b^{1/3}\,(c+d\,x)^{1/3}\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}\right)$$

Result (type 5, 82 leaves):

$$-\frac{2\,(c+d\,x)^{1/6}\left(1+2\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\;\text{Hypergeometric2F1}\left[\frac{1}{6},\frac{1}{2},\frac{7}{6},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)}{(b\,c-a\,d)\,\sqrt{a+b\,x}}$$

Problem 1759: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a+b\,x)^{5/2}\,(c+d\,x)^{5/6}}\,dx$$

Optimal (type 4, 410 leaves, 4 steps):

$$-\frac{2\,(c+d\,x)^{1/6}}{3\,(b\,c-a\,d)\,(a+b\,x)^{3/2}}+\frac{16\,d\,(c+d\,x)^{1/6}}{9\,(b\,c-a\,d)^2\,\sqrt{a+b\,x}}+$$

$$\left(16\,d\,(c+d\,x)^{1/6}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)\right.$$

$$\sqrt{\frac{(b\,c-a\,d)^{2/3}+b^{1/3}\,(b\,c-a\,d)^{1/3}\,(c+d\,x)^{1/3}+b^{2/3}\,(c+d\,x)^{2/3}}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}$$

$$\left.\text{EllipticF}\left[\text{ArcCos}\left[\frac{(b\,c-a\,d)^{1/3}-\left(1-\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}{(b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}\right],\,\frac{1}{4}\,\left(2+\sqrt{3}\right)\right]\right)\Bigg/$$

$$\left(9\times 3^{1/4}\,(b\,c-a\,d)^{7/3}\,\sqrt{a+b\,x}\,\sqrt{-\frac{b^{1/3}\,(c+d\,x)^{1/3}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}\right)$$

Result (type 5, 102 leaves) :

$$\left(2\,(c+d\,x)^{1/6}\,\left(-3\,b\,c+11\,a\,d+8\,b\,d\,x+16\,d\,(a+b\,x)\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\right.\right.$$

$$\left.\left.\text{Hypergeometric2F1}\left[\frac{1}{6},\,\frac{1}{2},\,\frac{7}{6},\,\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\right)\Bigg/\left(9\,(b\,c-a\,d)^2\,(a+b\,x)^{3/2}\right)$$

Problem 1760: Result unnecessarily involves higher level functions.

$$\int\frac{(a+b\,x)^{5/2}}{(c+d\,x)^{7/6}}\,dx$$

Optimal (type 4, 880 leaves, 7 steps) :

$$-\frac{6\,(a+b\,x)^{5/2}}{d\,(c+d\,x)^{1/6}}-\frac{405\,b\,(b\,c-a\,d)\,\sqrt{a+b\,x}\,(c+d\,x)^{5/6}}{56\,d^3}+$$

$$\frac{45\,b\,(a+b\,x)^{3/2}\,(c+d\,x)^{5/6}}{7\,d^2}-\frac{1215\,\left(1+\sqrt{3}\right)\,b^{1/3}\,(b\,c-a\,d)^2\,\sqrt{a+b\,x}\,(c+d\,x)^{1/6}}{112\,d^3\,\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)}-$$

$$\Bigg(1215\times 3^{1/4}\,b^{1/3}\,(b\,c-a\,d)^{7/3}\,(c+d\,x)^{1/6}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)$$

$$\sqrt{\frac{(b\,c-a\,d)^{2/3}+b^{1/3}\,(b\,c-a\,d)^{1/3}\,(c+d\,x)^{1/3}+b^{2/3}\,(c+d\,x)^{2/3}}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}$$

$$\text{EllipticE}\left[\text{ArcCos}\left[\frac{(b\,c-a\,d)^{1/3}-\left(1-\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}{(b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}\right],\,\frac{1}{4}\,\left(2+\sqrt{3}\right)\right]\Bigg)\Bigg/$$

$$\left(112\,d^4\,\sqrt{a+b\,x}\,\sqrt{-\frac{b^{1/3}\,(c+d\,x)^{1/3}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}\right)-$$

$$\Bigg(405\times 3^{3/4}\,\left(1-\sqrt{3}\right)\,b^{1/3}\,(b\,c-a\,d)^{7/3}\,(c+d\,x)^{1/6}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)$$

$$\sqrt{\frac{(b\,c-a\,d)^{2/3}+b^{1/3}\,(b\,c-a\,d)^{1/3}\,(c+d\,x)^{1/3}+b^{2/3}\,(c+d\,x)^{2/3}}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}$$

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

$$\left(224\,d^4\,\sqrt{a+b\,x}\,\sqrt{-\frac{b^{1/3}\,(c+d\,x)^{1/3}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^2}}\right)$$

Result (type 5, 132 leaves) :

$$\frac{1}{56\,d^4\,\sqrt{a+b\,x}}3\,(c+d\,x)^{5/6}\left(d\,(a+b\,x)\,\left(b\,(-23\,b\,c+31\,a\,d)+8\,b^2\,d\,x-\frac{112\,(b\,c-a\,d)^2}{c+d\,x}\right)+\right.$$

$$\left.81\,b\,(b\,c-a\,d)^2\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\,\frac{5}{6},\,\frac{11}{6},\,\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)$$

Problem 1761: Result unnecessarily involves higher level functions.

$$\int \frac{(a+b x)^{3/2}}{(c+d x)^{7/6}} \, dx$$

Optimal (type 4, 844 leaves, 6 steps):

$$-\frac{6 (a+b x)^{3/2}}{d (c+d x)^{1/6}}+\frac{27 b \sqrt{a+b x} (c+d x)^{5/6}}{4 d^2}+\frac{81 \left(1+\sqrt{3}\right) b^{1/3} (b c-a d) \sqrt{a+b x} (c+d x)^{1/6}}{8 d^2 \left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}\right)}+$$

$$\left(81\times 3^{1/4} b^{1/3} (b c-a d)^{4/3} (c+d x)^{1/6} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right) \sqrt{\frac{(b c-a d)^{2/3}+b^{1/3} (b c-a d)^{1/3} (c+d x)^{1/3}+b^{2/3} (c+d x)^{2/3}}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}\right)^2}} \text{EllipticE}\left[\text{ArcCos}\left[\frac{(b c-a d)^{1/3}-\left(1-\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}}{(b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}}\right], \frac{1}{4} \left(2+\sqrt{3}\right)\right]\right) \Big/ \left(8 d^3 \sqrt{a+b x} \sqrt{-\frac{b^{1/3} (c+d x)^{1/3} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}\right)^2}}\right)+$$

$$\left(27\times 3^{3/4} \left(1-\sqrt{3}\right) b^{1/3} (b c-a d)^{4/3} (c+d x)^{1/6} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right) \sqrt{\frac{(b c-a d)^{2/3}+b^{1/3} (b c-a d)^{1/3} (c+d x)^{1/3}+b^{2/3} (c+d x)^{2/3}}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}\right)^2}} \text{EllipticF}\left[\text{ArcCos}\left[\frac{(b c-a d)^{1/3}-\left(1-\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}}{(b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}}\right], \frac{1}{4} \left(2+\sqrt{3}\right)\right]\right) \Big/ \left(16 d^3 \sqrt{a+b x} \sqrt{-\frac{b^{1/3} (c+d x)^{1/3} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}\right)^2}}\right)$$

Result (type 5, 99 leaves):

$$\frac{1}{20 d^2} 3 \sqrt{a+b x} (c+d x)^{5/6} \left(\frac{5 (9 b c-8 a d+b d x)}{c+d x}+\frac{27 b \,\text{Hypergeometric2F1}\left[\frac{1}{2}, \frac{5}{6}, \frac{11}{6}, \frac{b (c+d x)}{b c-a d}\right]}{\sqrt{\frac{d (a+b x)}{-b c+a d}}}\right)$$

Problem 1762: Result unnecessarily involves higher level functions.

$$\int \frac{\sqrt{a+b x}}{(c+d x)^{7/6}}\, dx$$

Optimal (type 4, 806 leaves, 5 steps):

$$-\frac{6\sqrt{a+b x}}{d\,(c+d x)^{1/6}}-\frac{9\left(1+\sqrt{3}\right) b^{1/3}\sqrt{a+b x}\,(c+d x)^{1/6}}{d\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3}(c+d x)^{1/3}\right)}-$$

$$\left(9\times 3^{1/4} b^{1/3}(b c-a d)^{1/3}(c+d x)^{1/6}\left((b c-a d)^{1/3}-b^{1/3}(c+d x)^{1/3}\right)\right.$$

$$\sqrt{\frac{(b c-a d)^{2/3}+b^{1/3}(b c-a d)^{1/3}(c+d x)^{1/3}+b^{2/3}(c+d x)^{2/3}}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3}(c+d x)^{1/3}\right)^2}}$$

$$\left.\text{EllipticE}\left[\text{ArcCos}\left[\frac{(b c-a d)^{1/3}-\left(1-\sqrt{3}\right) b^{1/3}(c+d x)^{1/3}}{(b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3}(c+d x)^{1/3}}\right],\frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\bigg/$$

$$\left(d^2\sqrt{a+b x}\sqrt{-\frac{b^{1/3}(c+d x)^{1/3}\left((b c-a d)^{1/3}-b^{1/3}(c+d x)^{1/3}\right)}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3}(c+d x)^{1/3}\right)^2}}\right)-$$

$$\left(3\times 3^{3/4}\left(1-\sqrt{3}\right) b^{1/3}(b c-a d)^{1/3}(c+d x)^{1/6}\left((b c-a d)^{1/3}-b^{1/3}(c+d x)^{1/3}\right)\right.$$

$$\sqrt{\frac{(b c-a d)^{2/3}+b^{1/3}(b c-a d)^{1/3}(c+d x)^{1/3}+b^{2/3}(c+d x)^{2/3}}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3}(c+d x)^{1/3}\right)^2}}$$

$$\left.\text{EllipticF}\left[\text{ArcCos}\left[\frac{(b c-a d)^{1/3}-\left(1-\sqrt{3}\right) b^{1/3}(c+d x)^{1/3}}{(b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3}(c+d x)^{1/3}}\right],\frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\bigg/$$

$$\left(2 d^2\sqrt{a+b x}\sqrt{-\frac{b^{1/3}(c+d x)^{1/3}\left((b c-a d)^{1/3}-b^{1/3}(c+d x)^{1/3}\right)}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3}(c+d x)^{1/3}\right)^2}}\right)$$

Result (type 5, 90 leaves):

$$\left(-30 d\,(a+b x)+18 b\sqrt{\frac{d\,(a+b x)}{-b c+a d}}\,(c+d x)\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{5}{6},\frac{11}{6},\frac{b\,(c+d x)}{b c-a d}\right]\right)\bigg/$$

$$\left(5 d^2\sqrt{a+b x}\,(c+d x)^{1/6}\right)$$

Problem 1763: Result unnecessarily involves higher level functions.

$$\int \frac{1}{\sqrt{a+b x}\ (c+d x)^{7/6}}\, dx$$

Optimal (type 4, 817 leaves, 5 steps):

$$\frac{6\sqrt{a+b x}}{(b c-a d)\ (c+d x)^{1/6}}+\frac{6\left(1+\sqrt{3}\right) b^{1/3}\sqrt{a+b x}\ (c+d x)^{1/6}}{(b c-a d)\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3}(c+d x)^{1/3}\right)}+$$

$$\left(6\times 3^{1/4} b^{1/3} (c+d x)^{1/6}\left((b c-a d)^{1/3}-b^{1/3}(c+d x)^{1/3}\right)\right.$$

$$\sqrt{\frac{(b c-a d)^{2/3}+b^{1/3}(b c-a d)^{1/3}(c+d x)^{1/3}+b^{2/3}(c+d x)^{2/3}}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3}(c+d x)^{1/3}\right)^2}}$$

$$\left.\text{EllipticE}\left[\text{ArcCos}\left[\frac{(b c-a d)^{1/3}-\left(1-\sqrt{3}\right) b^{1/3}(c+d x)^{1/3}}{(b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3}(c+d x)^{1/3}}\right],\frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\Big/$$

$$\left(d\ (b c-a d)^{2/3}\sqrt{a+b x}\ \sqrt{-\frac{b^{1/3}(c+d x)^{1/3}\left((b c-a d)^{1/3}-b^{1/3}(c+d x)^{1/3}\right)}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3}(c+d x)^{1/3}\right)^2}}\right)+$$

$$\left(3^{3/4}\left(1-\sqrt{3}\right) b^{1/3}(c+d x)^{1/6}\left((b c-a d)^{1/3}-b^{1/3}(c+d x)^{1/3}\right)\right.$$

$$\sqrt{\frac{(b c-a d)^{2/3}+b^{1/3}(b c-a d)^{1/3}(c+d x)^{1/3}+b^{2/3}(c+d x)^{2/3}}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3}(c+d x)^{1/3}\right)^2}}$$

$$\left.\text{EllipticF}\left[\text{ArcCos}\left[\frac{(b c-a d)^{1/3}-\left(1-\sqrt{3}\right) b^{1/3}(c+d x)^{1/3}}{(b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3}(c+d x)^{1/3}}\right],\frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\Big/$$

$$\left(d\ (b c-a d)^{2/3}\sqrt{a+b x}\ \sqrt{-\frac{b^{1/3}(c+d x)^{1/3}\left((b c-a d)^{1/3}-b^{1/3}(c+d x)^{1/3}\right)}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3}(c+d x)^{1/3}\right)^2}}\right)$$

Result (type 5, 100 leaves):

$$\left(6\left(5 d\ (a+b x)-2 b\sqrt{\frac{d\ (a+b x)}{-b c+a d}}\ (c+d x)\ \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{5}{6},\frac{11}{6},\frac{b\ (c+d x)}{b c-a d}\right]\right)\right)\Big/$$

$$\left(5 d\ (b c-a d)\sqrt{a+b x}\ (c+d x)^{1/6}\right)$$

Problem 1764: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a+b x)^{3/2} (c+d x)^{7/6}} \, dx$$

Optimal (type 4, 844 leaves, 6 steps):

$$-\frac{2}{(b c-a d) \sqrt{a+b x} (c+d x)^{1/6}}-\frac{8 d \sqrt{a+b x}}{(b c-a d)^2 (c+d x)^{1/6}}-\frac{8 \left(1+\sqrt{3}\right) b^{1/3} d \sqrt{a+b x} (c+d x)^{1/6}}{(b c-a d)^2 \left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}\right)}-$$

$$\left(8\times 3^{1/4} b^{1/3} (c+d x)^{1/6} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right) \sqrt{\frac{(b c-a d)^{2/3}+b^{1/3} (b c-a d)^{1/3} (c+d x)^{1/3}+b^{2/3} (c+d x)^{2/3}}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcCos}\left[\frac{(b c-a d)^{1/3}-\left(1-\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}}{(b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}}\right], \frac{1}{4} \left(2+\sqrt{3}\right)\right]\right) \Bigg/$$

$$\left((b c-a d)^{5/3} \sqrt{a+b x} \sqrt{-\frac{b^{1/3} (c+d x)^{1/3} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}\right)^2}}\right)-$$

$$\left(4 \left(1-\sqrt{3}\right) b^{1/3} (c+d x)^{1/6} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right) \sqrt{\frac{(b c-a d)^{2/3}+b^{1/3} (b c-a d)^{1/3} (c+d x)^{1/3}+b^{2/3} (c+d x)^{2/3}}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcCos}\left[\frac{(b c-a d)^{1/3}-\left(1-\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}}{(b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}}\right], \frac{1}{4} \left(2+\sqrt{3}\right)\right]\right) \Bigg/$$

$$\left(3^{1/4} (b c-a d)^{5/3} \sqrt{a+b x} \sqrt{-\frac{b^{1/3} (c+d x)^{1/3} \left((b c-a d)^{1/3}-b^{1/3} (c+d x)^{1/3}\right)}{\left((b c-a d)^{1/3}-\left(1+\sqrt{3}\right) b^{1/3} (c+d x)^{1/3}\right)^2}}\right)$$

Result (type 5, 102 leaves):

$$-\left(\left(2\left(15\,a\,d+5\,b\,(c+4\,d\,x)-8\,b\,\sqrt{\frac{d\,(a+b\,x)}{-b\,c+a\,d}}\,(c+d\,x)\right.\right.\right.$$

$$\left.\left.\left.\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{5}{6},\frac{11}{6},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\right)\Big/\left(5\,(b\,c-a\,d)^2\,\sqrt{a+b\,x}\,(c+d\,x)^{1/6}\right)\right)$$

Problem 1765: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(a+b\,x)^{5/2}\,(c+d\,x)^{7/6}}\,dx$$

Optimal (type 4, 893 leaves, 7 steps):

$$-\frac{2}{3\,(b\,c-a\,d)\,(a+b\,x)^{3/2}\,(c+d\,x)^{1/6}}+\frac{20\,d}{9\,(b\,c-a\,d)^{2}\,\sqrt{a+b\,x}\,(c+d\,x)^{1/6}}+$$

$$\frac{80\,d^{2}\,\sqrt{a+b\,x}}{9\,(b\,c-a\,d)^{3}\,(c+d\,x)^{1/6}}+\frac{80\,\left(1+\sqrt{3}\right)\,b^{1/3}\,d^{2}\,\sqrt{a+b\,x}\,(c+d\,x)^{1/6}}{9\,(b\,c-a\,d)^{3}\,\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)}+$$

$$\left(80\,b^{1/3}\,d\,(c+d\,x)^{1/6}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)\right.$$

$$\sqrt{\frac{(b\,c-a\,d)^{2/3}+b^{1/3}\,(b\,c-a\,d)^{1/3}\,(c+d\,x)^{1/3}+b^{2/3}\,(c+d\,x)^{2/3}}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^{2}}}$$

$$\left.\text{EllipticE}\left[\text{ArcCos}\left[\frac{(b\,c-a\,d)^{1/3}-\left(1-\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}{(b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}\right],\,\frac{1}{4}\,\left(2+\sqrt{3}\right)\right]\right)\Big/$$

$$\left(3\times 3^{3/4}\,(b\,c-a\,d)^{8/3}\,\sqrt{a+b\,x}\,\sqrt{-\frac{b^{1/3}\,(c+d\,x)^{1/3}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^{2}}}\right)+$$

$$\left(40\,\left(1-\sqrt{3}\right)\,b^{1/3}\,d\,(c+d\,x)^{1/6}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)\right.$$

$$\sqrt{\frac{(b\,c-a\,d)^{2/3}+b^{1/3}\,(b\,c-a\,d)^{1/3}\,(c+d\,x)^{1/3}+b^{2/3}\,(c+d\,x)^{2/3}}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^{2}}}$$

$$\left.\text{EllipticF}\left[\text{ArcCos}\left[\frac{(b\,c-a\,d)^{1/3}-\left(1-\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}{(b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}}\right],\,\frac{1}{4}\,\left(2+\sqrt{3}\right)\right]\right)\Big/$$

$$\left(9\times 3^{1/4}\,(b\,c-a\,d)^{8/3}\,\sqrt{a+b\,x}\,\sqrt{-\frac{b^{1/3}\,(c+d\,x)^{1/3}\,\left((b\,c-a\,d)^{1/3}-b^{1/3}\,(c+d\,x)^{1/3}\right)}{\left((b\,c-a\,d)^{1/3}-\left(1+\sqrt{3}\right)\,b^{1/3}\,(c+d\,x)^{1/3}\right)^{2}}}\right)$$

Result (type 5, 139 leaves) :

$$-\left(\left(2\left(27 a^2 d^2+2 a b d (8 c+35 d x)+b^2\left(-3 c^2+10 c d x+40 d^2 x^2\right)-16 b d (a+b x) \sqrt{\frac{d (a+b x)}{-b c+a d}} (c+d x) \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{5}{6},\frac{11}{6},\frac{b (c+d x)}{b c-a d}\right]\right)\right)\Big/\left(9 (-b c+a d)^3 (a+b x)^{3/2} (c+d x)^{1/6}\right)\right)$$

Problem 1766: Result more than twice size of optimal antiderivative.

$$\int (a+b x)^{1/6} (c+d x)^{13/6} \, dx$$

Optimal (type 5, 84 leaves, 2 steps):

$$\frac{1}{7 b^3 \left(\frac{b (c+d x)}{b c-a d}\right)^{1/6}} 6 (b c-a d)^2 (a+b x)^{7/6} (c+d x)^{1/6} \text{Hypergeometric2F1}\left[-\frac{13}{6},\frac{7}{6},\frac{13}{6},-\frac{d (a+b x)}{b c-a d}\right]$$

Result (type 5, 182 leaves):

$$-\left(\left(3 (c+d x)^{1/6}\left(-d (a+b x)\left(91 a^3 d^3-13 a^2 b d^2 (23 c+2 d x)+a b^2 d\left(341 c^2+84 c d x+16 d^2 x^2\right)+b^3\left(91 c^3+614 c^2 d x+656 c d^2 x^2+224 d^3 x^3\right)\right)+91 (b c-a d)^4 \left(\frac{d (a+b x)}{-b c+a d}\right)^{5/6} \text{Hypergeometric2F1}\left[\frac{1}{6},\frac{5}{6},\frac{7}{6},\frac{b (c+d x)}{b c-a d}\right]\right)\right)\Big/\left(2240 b^3 d^2 (a+b x)^{5/6}\right)\right)$$

Problem 1772: Result unnecessarily involves higher level functions.

$$\int (a+b x)^{1/6} (c+d x)^{5/6} \, dx$$

Optimal (type 3, 427 leaves, 14 steps):

$$\frac{5\,(b\,c-a\,d)\,(a+b\,x)^{1/6}\,(c+d\,x)^{5/6}}{12\,b\,d}+\frac{(a+b\,x)^{7/6}\,(c+d\,x)^{5/6}}{2\,b}+$$
$$\frac{5\,(b\,c-a\,d)^2\,\text{ArcTan}\left[\frac{1}{\sqrt{3}}-\frac{2\,d^{1/6}\,(a+b\,x)^{1/6}}{\sqrt{3}\,b^{1/6}\,(c+d\,x)^{1/6}}\right]}{24\,\sqrt{3}\,b^{11/6}\,d^{7/6}}-\frac{5\,(b\,c-a\,d)^2\,\text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2\,d^{1/6}\,(a+b\,x)^{1/6}}{\sqrt{3}\,b^{1/6}\,(c+d\,x)^{1/6}}\right]}{24\,\sqrt{3}\,b^{11/6}\,d^{7/6}}-$$
$$\frac{5\,(b\,c-a\,d)^2\,\text{ArcTanh}\left[\frac{d^{1/6}\,(a+b\,x)^{1/6}}{b^{1/6}\,(c+d\,x)^{1/6}}\right]}{36\,b^{11/6}\,d^{7/6}}+\frac{5\,(b\,c-a\,d)^2\,\text{Log}\left[b^{1/3}+\frac{d^{1/3}\,(a+b\,x)^{1/3}}{(c+d\,x)^{1/3}}-\frac{b^{1/6}\,d^{1/6}\,(a+b\,x)^{1/6}}{(c+d\,x)^{1/6}}\right]}{144\,b^{11/6}\,d^{7/6}}-$$
$$\frac{5\,(b\,c-a\,d)^2\,\text{Log}\left[b^{1/3}+\frac{d^{1/3}\,(a+b\,x)^{1/3}}{(c+d\,x)^{1/3}}+\frac{b^{1/6}\,d^{1/6}\,(a+b\,x)^{1/6}}{(c+d\,x)^{1/6}}\right]}{144\,b^{11/6}\,d^{7/6}}$$

Result (type 5, 109 leaves):

$$\left((c+d\,x)^{5/6}\left(d\,(a+b\,x)\,(5\,b\,c+a\,d+6\,b\,d\,x)-(b\,c-a\,d)^2\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{5/6}\text{Hypergeometric2F1}\left[\frac{5}{6},\frac{5}{6},\frac{11}{6},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\right)\Big/\left(12\,b\,d^2\,(a+b\,x)^{5/6}\right)$$

Problem 1773: Result unnecessarily involves higher level functions.

$$\int\frac{(a+b\,x)^{1/6}}{(c+d\,x)^{1/6}}\,dx$$

Optimal (type 3, 378 leaves, 13 steps):

$$\frac{(a+b\,x)^{1/6}\,(c+d\,x)^{5/6}}{d}+\frac{(b\,c-a\,d)\,\text{ArcTan}\left[\frac{1}{\sqrt{3}}-\frac{2\,d^{1/6}\,(a+b\,x)^{1/6}}{\sqrt{3}\,b^{1/6}\,(c+d\,x)^{1/6}}\right]}{2\,\sqrt{3}\,b^{5/6}\,d^{7/6}}-$$
$$\frac{(b\,c-a\,d)\,\text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2\,d^{1/6}\,(a+b\,x)^{1/6}}{\sqrt{3}\,b^{1/6}\,(c+d\,x)^{1/6}}\right]}{2\,\sqrt{3}\,b^{5/6}\,d^{7/6}}-\frac{(b\,c-a\,d)\,\text{ArcTanh}\left[\frac{d^{1/6}\,(a+b\,x)^{1/6}}{b^{1/6}\,(c+d\,x)^{1/6}}\right]}{3\,b^{5/6}\,d^{7/6}}+$$
$$\frac{(b\,c-a\,d)\,\text{Log}\left[b^{1/3}+\frac{d^{1/3}\,(a+b\,x)^{1/3}}{(c+d\,x)^{1/3}}-\frac{b^{1/6}\,d^{1/6}\,(a+b\,x)^{1/6}}{(c+d\,x)^{1/6}}\right]}{12\,b^{5/6}\,d^{7/6}}-$$
$$\frac{(b\,c-a\,d)\,\text{Log}\left[b^{1/3}+\frac{d^{1/3}\,(a+b\,x)^{1/3}}{(c+d\,x)^{1/3}}+\frac{b^{1/6}\,d^{1/6}\,(a+b\,x)^{1/6}}{(c+d\,x)^{1/6}}\right]}{12\,b^{5/6}\,d^{7/6}}$$

Result (type 5, 76 leaves):

$$\frac{(a+b\,x)^{1/6}\,(c+d\,x)^{5/6}\left(5+\frac{\text{Hypergeometric2F1}\left[\frac{5}{6},\frac{5}{6},\frac{11}{6},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]}{\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{1/6}}\right)}{5\,d}$$

Problem 1774: Result unnecessarily involves higher level functions.

$$\int \frac{(a+b x)^{1/6}}{(c+d x)^{7/6}} \, dx$$

Optimal (type 3, 332 leaves, 13 steps):

$$-\frac{6 (a+b x)^{1/6}}{d (c+d x)^{1/6}}-\frac{\sqrt{3}\, b^{1/6} \text{ArcTan}\left[\frac{1}{\sqrt{3}}-\frac{2 d^{1/6} (a+b x)^{1/6}}{\sqrt{3}\, b^{1/6} (c+d x)^{1/6}}\right]}{d^{7/6}}+\frac{\sqrt{3}\, b^{1/6} \text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2 d^{1/6} (a+b x)^{1/6}}{\sqrt{3}\, b^{1/6} (c+d x)^{1/6}}\right]}{d^{7/6}}+\frac{2 b^{1/6} \text{ArcTanh}\left[\frac{d^{1/6} (a+b x)^{1/6}}{b^{1/6} (c+d x)^{1/6}}\right]}{d^{7/6}}-\frac{b^{1/6} \text{Log}\left[b^{1/3}+\frac{d^{1/3} (a+b x)^{1/3}}{(c+d x)^{1/3}}-\frac{b^{1/6} d^{1/6} (a+b x)^{1/6}}{(c+d x)^{1/6}}\right]}{2 d^{7/6}}+\frac{b^{1/6} \text{Log}\left[b^{1/3}+\frac{d^{1/3} (a+b x)^{1/3}}{(c+d x)^{1/3}}+\frac{b^{1/6} d^{1/6} (a+b x)^{1/6}}{(c+d x)^{1/6}}\right]}{2 d^{7/6}}$$

Result (type 5, 89 leaves):

$$\left(6 \left(-5 d (a+b x)+b \left(\frac{d (a+b x)}{-b c+a d}\right)^{5/6} (c+d x) \text{Hypergeometric2F1}\left[\frac{5}{6},\frac{5}{6},\frac{11}{6},\frac{b (c+d x)}{b c-a d}\right]\right)\right)\Big/\left(5 d^2 (a+b x)^{5/6} (c+d x)^{1/6}\right)$$

Problem 1779: Result unnecessarily involves higher level functions.

$$\int (a+b x)^{5/6} (c+d x)^{1/6} \, dx$$

Optimal (type 3, 427 leaves, 14 steps):

$$\frac{(b c-a d) (a+b x)^{5/6} (c+d x)^{1/6}}{12 b d}+\frac{(a+b x)^{11/6} (c+d x)^{1/6}}{2 b}-\frac{5 (b c-a d)^2 \text{ArcTan}\left[\frac{1}{\sqrt{3}}-\frac{2 d^{1/6} (a+b x)^{1/6}}{\sqrt{3}\, b^{1/6} (c+d x)^{1/6}}\right]}{24 \sqrt{3}\, b^{7/6} d^{11/6}}+\frac{5 (b c-a d)^2 \text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2 d^{1/6} (a+b x)^{1/6}}{\sqrt{3}\, b^{1/6} (c+d x)^{1/6}}\right]}{24 \sqrt{3}\, b^{7/6} d^{11/6}}-\frac{5 (b c-a d)^2 \text{ArcTanh}\left[\frac{d^{1/6} (a+b x)^{1/6}}{b^{1/6} (c+d x)^{1/6}}\right]}{36 b^{7/6} d^{11/6}}+\frac{5 (b c-a d)^2 \text{Log}\left[b^{1/3}+\frac{d^{1/3} (a+b x)^{1/3}}{(c+d x)^{1/3}}-\frac{b^{1/6} d^{1/6} (a+b x)^{1/6}}{(c+d x)^{1/6}}\right]}{144 b^{7/6} d^{11/6}}-\frac{5 (b c-a d)^2 \text{Log}\left[b^{1/3}+\frac{d^{1/3} (a+b x)^{1/3}}{(c+d x)^{1/3}}+\frac{b^{1/6} d^{1/6} (a+b x)^{1/6}}{(c+d x)^{1/6}}\right]}{144 b^{7/6} d^{11/6}}$$

Result (type 5, 109 leaves):

$$\left((c+d x)^{1/6} \left(d (a+b x) (5 a d+b (c+6 d x))-5 (b c-a d)^2 \left(\frac{d (a+b x)}{-b c+a d}\right)^{1/6} \text{Hypergeometric2F1}\left[\frac{1}{6},\frac{1}{6},\frac{7}{6},\frac{b (c+d x)}{b c-a d}\right]\right)\right)\Big/\left(12 b d^2 (a+b x)^{1/6}\right)$$

Problem 1780: Result unnecessarily involves higher level functions.

$$\int \frac{(a+b\,x)^{5/6}}{(c+d\,x)^{5/6}}\,dx$$

Optimal (type 3, 378 leaves, 13 steps):

$$\frac{(a+b\,x)^{5/6}\,(c+d\,x)^{1/6}}{d}-\frac{5\,(b\,c-a\,d)\,\text{ArcTan}\left[\frac{1}{\sqrt{3}}-\frac{2\,d^{1/6}\,(a+b\,x)^{1/6}}{\sqrt{3}\,b^{1/6}\,(c+d\,x)^{1/6}}\right]}{2\,\sqrt{3}\,b^{1/6}\,d^{11/6}}+\frac{5\,(b\,c-a\,d)\,\text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2\,d^{1/6}\,(a+b\,x)^{1/6}}{\sqrt{3}\,b^{1/6}\,(c+d\,x)^{1/6}}\right]}{2\,\sqrt{3}\,b^{1/6}\,d^{11/6}}-\frac{5\,(b\,c-a\,d)\,\text{ArcTanh}\left[\frac{d^{1/6}\,(a+b\,x)^{1/6}}{b^{1/6}\,(c+d\,x)^{1/6}}\right]}{3\,b^{1/6}\,d^{11/6}}+\frac{5\,(b\,c-a\,d)\,\text{Log}\left[b^{1/3}+\frac{d^{1/3}\,(a+b\,x)^{1/3}}{(c+d\,x)^{1/3}}-\frac{b^{1/6}\,d^{1/6}\,(a+b\,x)^{1/6}}{(c+d\,x)^{1/6}}\right]}{12\,b^{1/6}\,d^{11/6}}-\frac{5\,(b\,c-a\,d)\,\text{Log}\left[b^{1/3}+\frac{d^{1/3}\,(a+b\,x)^{1/3}}{(c+d\,x)^{1/3}}+\frac{b^{1/6}\,d^{1/6}\,(a+b\,x)^{1/6}}{(c+d\,x)^{1/6}}\right]}{12\,b^{1/6}\,d^{11/6}}$$

Result (type 5, 74 leaves):

$$\frac{(a+b\,x)^{5/6}\,(c+d\,x)^{1/6}\left(1+\frac{5\,\text{Hypergeometric2F1}\left[\frac{1}{6},\frac{1}{6},\frac{7}{6},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]}{\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{5/6}}\right)}{d}$$

Problem 1781: Result unnecessarily involves higher level functions.

$$\int \frac{(a+b\,x)^{5/6}}{(c+d\,x)^{11/6}}\,dx$$

Optimal (type 3, 334 leaves, 13 steps):

$$-\frac{6\,(a+b\,x)^{5/6}}{5\,d\,(c+d\,x)^{5/6}}+\frac{\sqrt{3}\,b^{5/6}\,\text{ArcTan}\left[\frac{1}{\sqrt{3}}-\frac{2\,d^{1/6}\,(a+b\,x)^{1/6}}{\sqrt{3}\,b^{1/6}\,(c+d\,x)^{1/6}}\right]}{d^{11/6}}-\frac{\sqrt{3}\,b^{5/6}\,\text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2\,d^{1/6}\,(a+b\,x)^{1/6}}{\sqrt{3}\,b^{1/6}\,(c+d\,x)^{1/6}}\right]}{d^{11/6}}+\frac{2\,b^{5/6}\,\text{ArcTanh}\left[\frac{d^{1/6}\,(a+b\,x)^{1/6}}{b^{1/6}\,(c+d\,x)^{1/6}}\right]}{d^{11/6}}-\frac{b^{5/6}\,\text{Log}\left[b^{1/3}+\frac{d^{1/3}\,(a+b\,x)^{1/3}}{(c+d\,x)^{1/3}}-\frac{b^{1/6}\,d^{1/6}\,(a+b\,x)^{1/6}}{(c+d\,x)^{1/6}}\right]}{2\,d^{11/6}}+\frac{b^{5/6}\,\text{Log}\left[b^{1/3}+\frac{d^{1/3}\,(a+b\,x)^{1/3}}{(c+d\,x)^{1/3}}+\frac{b^{1/6}\,d^{1/6}\,(a+b\,x)^{1/6}}{(c+d\,x)^{1/6}}\right]}{2\,d^{11/6}}$$

Result (type 5, 90 leaves):

$$\left(-6\,d\,(a+b\,x)+30\,b\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{1/6}(c+d\,x)\,\text{Hypergeometric2F1}\left[\frac{1}{6},\frac{1}{6},\frac{7}{6},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\Big/\left(5\,d^2\,(a+b\,x)^{1/6}\,(c+d\,x)^{5/6}\right)$$

Problem 1792: Result more than twice size of optimal antiderivative.

$$\int (a+b x)^{7/6} (c+d x)^{13/6} \, dx$$

Optimal (type 5, 84 leaves, 2 steps):

$$\frac{1}{13 b^3 \left(\frac{b (c+d x)}{b c-a d}\right)^{1/6}} 6 (b c-a d)^2 (a+b x)^{13/6} (c+d x)^{1/6} \text{Hypergeometric2F1}\left[-\frac{13}{6}, \frac{13}{6}, \frac{19}{6}, -\frac{d (a+b x)}{b c-a d}\right]$$

Result (type 5, 234 leaves):

$$-\frac{1}{8320 b^3 d^3 (a+b x)^{5/6}} 3 (c+d x)^{1/6} \Big(-d (a+b x) \big(91 a^4 d^4-26 a^3 b d^3 (15 c+d x)+2 a^2 b^2 d^2 \left(320 c^2+55 c d x+8 d^2 x^2\right)+ 2 a b^3 d \left(195 c^3+1225 c^2 d x+1280 c d^2 x^2+432 d^3 x^3\right)+ b^4 \left(-91 c^4+26 c^3 d x+1264 c^2 d^2 x^2+1696 c d^3 x^3+640 d^4 x^4\right)\big)- 91 (b c-a d)^5 \left(\frac{d (a+b x)}{-b c+a d}\right)^{5/6} \text{Hypergeometric2F1}\left[\frac{1}{6}, \frac{5}{6}, \frac{7}{6}, \frac{b (c+d x)}{b c-a d}\right]\Big)$$

Problem 1793: Result more than twice size of optimal antiderivative.

$$\int (a+b x)^{7/6} (c+d x)^{7/6} \, dx$$

Optimal (type 5, 82 leaves, 2 steps):

$$\frac{1}{13 b^2 \left(\frac{b (c+d x)}{b c-a d}\right)^{1/6}} 6 (b c-a d) (a+b x)^{13/6} (c+d x)^{1/6} \text{Hypergeometric2F1}\left[-\frac{7}{6}, \frac{13}{6}, \frac{19}{6}, -\frac{d (a+b x)}{b c-a d}\right]$$

Result (type 5, 183 leaves):

$$\Big(3 (c+d x)^{1/6} \Big(-d (a+b x) \big(7 a^3 d^3-a^2 b d^2 (23 c+2 d x)-a b^2 d \left(23 c^2+92 c d x+48 d^2 x^2\right)+ b^3 \left(7 c^3-2 c^2 d x-48 c d^2 x^2-32 d^3 x^3\right)\big)+7 (b c-a d)^4 \left(\frac{d (a+b x)}{-b c+a d}\right)^{5/6} \text{Hypergeometric2F1}\left[\frac{1}{6}, \frac{5}{6}, \frac{7}{6}, \frac{b (c+d x)}{b c-a d}\right]\Big)\Big) \Big/ \left(320 b^2 d^3 (a+b x)^{5/6}\right)$$

Problem 1798: Result unnecessarily involves higher level functions.

$$\int \frac{(a+b x)^{7/6}}{(c+d x)^{1/6}} \, dx$$

Optimal (type 3, 424 leaves, 14 steps):

$$-\frac{7 (b c-a d) (a+b x)^{1/6} (c+d x)^{5/6}}{12 d^2}+\frac{(a+b x)^{7/6} (c+d x)^{5/6}}{2 d}-\frac{7 (b c-a d)^2 \text{ArcTan}\left[\frac{1}{\sqrt{3}}-\frac{2 d^{1/6} (a+b x)^{1/6}}{\sqrt{3} b^{1/6} (c+d x)^{1/6}}\right]}{24 \sqrt{3} b^{5/6} d^{13/6}}+\frac{7 (b c-a d)^2 \text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2 d^{1/6} (a+b x)^{1/6}}{\sqrt{3} b^{1/6} (c+d x)^{1/6}}\right]}{24 \sqrt{3} b^{5/6} d^{13/6}}+\frac{7 (b c-a d)^2 \text{ArcTanh}\left[\frac{d^{1/6} (a+b x)^{1/6}}{b^{1/6} (c+d x)^{1/6}}\right]}{36 b^{5/6} d^{13/6}}-\frac{7 (b c-a d)^2 \text{Log}\left[b^{1/3}+\frac{d^{1/3} (a+b x)^{1/3}}{(c+d x)^{1/3}}-\frac{b^{1/6} d^{1/6} (a+b x)^{1/6}}{(c+d x)^{1/6}}\right]}{144 b^{5/6} d^{13/6}}+\frac{7 (b c-a d)^2 \text{Log}\left[b^{1/3}+\frac{d^{1/3} (a+b x)^{1/3}}{(c+d x)^{1/3}}+\frac{b^{1/6} d^{1/6} (a+b x)^{1/6}}{(c+d x)^{1/6}}\right]}{144 b^{5/6} d^{13/6}}$$

Result (type 5, 108 leaves):

$$\frac{1}{60 d^3 (a+b x)^{5/6}} (c+d x)^{5/6} \left(5 d (a+b x) (-7 b c+13 a d+6 b d x)+7 (b c-a d)^2 \left(\frac{d (a+b x)}{-b c+a d}\right)^{5/6} \text{Hypergeometric2F1}\left[\frac{5}{6},\frac{5}{6},\frac{11}{6},\frac{b (c+d x)}{b c-a d}\right]\right)$$

Problem 1799: Result unnecessarily involves higher level functions.

$$\int \frac{(a+b x)^{7/6}}{(c+d x)^{7/6}} \, dx$$

Optimal (type 3, 403 leaves, 14 steps):

$$-\frac{6 (a+b x)^{7/6}}{d (c+d x)^{1/6}}+\frac{7 b (a+b x)^{1/6} (c+d x)^{5/6}}{d^2}+\frac{7 b^{1/6} (b c-a d) \text{ArcTan}\left[\frac{1}{\sqrt{3}}-\frac{2 d^{1/6} (a+b x)^{1/6}}{\sqrt{3} b^{1/6} (c+d x)^{1/6}}\right]}{2 \sqrt{3} d^{13/6}}-\frac{7 b^{1/6} (b c-a d) \text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2 d^{1/6} (a+b x)^{1/6}}{\sqrt{3} b^{1/6} (c+d x)^{1/6}}\right]}{2 \sqrt{3} d^{13/6}}-\frac{7 b^{1/6} (b c-a d) \text{ArcTanh}\left[\frac{d^{1/6} (a+b x)^{1/6}}{b^{1/6} (c+d x)^{1/6}}\right]}{3 d^{13/6}}+\frac{7 b^{1/6} (b c-a d) \text{Log}\left[b^{1/3}+\frac{d^{1/3} (a+b x)^{1/3}}{(c+d x)^{1/3}}-\frac{b^{1/6} d^{1/6} (a+b x)^{1/6}}{(c+d x)^{1/6}}\right]}{12 d^{13/6}}-\frac{7 b^{1/6} (b c-a d) \text{Log}\left[b^{1/3}+\frac{d^{1/3} (a+b x)^{1/3}}{(c+d x)^{1/3}}+\frac{b^{1/6} d^{1/6} (a+b x)^{1/6}}{(c+d x)^{1/6}}\right]}{12 d^{13/6}}$$

Result (type 5, 99 leaves):

$$\frac{1}{5\,d^2}\left(a+b\,x\right)^{1/6}\left(c+d\,x\right)^{5/6}\left(\frac{5\left(7\,b\,c-6\,a\,d+b\,d\,x\right)}{c+d\,x}+\frac{7\,b\,\text{Hypergeometric2F1}\left[\frac{5}{6},\frac{5}{6},\frac{11}{6},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]}{\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{1/6}}\right)$$

Problem 1800: Result unnecessarily involves higher level functions.

$$\int\frac{\left(a+b\,x\right)^{7/6}}{\left(c+d\,x\right)^{13/6}}\,dx$$

Optimal (type 3, 358 leaves, 14 steps):

$$-\frac{6\left(a+b\,x\right)^{7/6}}{7\,d\left(c+d\,x\right)^{7/6}}-\frac{6\,b\left(a+b\,x\right)^{1/6}}{d^2\left(c+d\,x\right)^{1/6}}-\frac{\sqrt{3}\,b^{7/6}\,\text{ArcTan}\left[\frac{1}{\sqrt{3}}-\frac{2\,d^{1/6}\,(a+b\,x)^{1/6}}{\sqrt{3}\,b^{1/6}\,(c+d\,x)^{1/6}}\right]}{d^{13/6}}+$$
$$\frac{\sqrt{3}\,b^{7/6}\,\text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2\,d^{1/6}\,(a+b\,x)^{1/6}}{\sqrt{3}\,b^{1/6}\,(c+d\,x)^{1/6}}\right]}{d^{13/6}}+\frac{2\,b^{7/6}\,\text{ArcTanh}\left[\frac{d^{1/6}\,(a+b\,x)^{1/6}}{b^{1/6}\,(c+d\,x)^{1/6}}\right]}{d^{13/6}}-$$
$$\frac{b^{7/6}\,\text{Log}\left[b^{1/3}+\frac{d^{1/3}\,(a+b\,x)^{1/3}}{(c+d\,x)^{1/3}}-\frac{b^{1/6}\,d^{1/6}\,(a+b\,x)^{1/6}}{(c+d\,x)^{1/6}}\right]}{2\,d^{13/6}}+\frac{b^{7/6}\,\text{Log}\left[b^{1/3}+\frac{d^{1/3}\,(a+b\,x)^{1/3}}{(c+d\,x)^{1/3}}+\frac{b^{1/6}\,d^{1/6}\,(a+b\,x)^{1/6}}{(c+d\,x)^{1/6}}\right]}{2\,d^{13/6}}$$

Result (type 5, 107 leaves):

$$\left(-30\,d\left(a+b\,x\right)\left(7\,b\,c+a\,d+8\,b\,d\,x\right)+42\,b^2\left(\frac{d\left(a+b\,x\right)}{-b\,c+a\,d}\right)^{5/6}\left(c+d\,x\right)^2\right.$$
$$\left.\text{Hypergeometric2F1}\left[\frac{5}{6},\frac{5}{6},\frac{11}{6},\frac{b\left(c+d\,x\right)}{b\,c-a\,d}\right]\right)\Big/\left(35\,d^3\left(a+b\,x\right)^{5/6}\left(c+d\,x\right)^{7/6}\right)$$

Problem 1805: Result unnecessarily involves higher level functions.

$$\int\frac{\left(c+d\,x\right)^{7/6}}{\left(a+b\,x\right)^{1/6}}\,dx$$

Optimal (type 3, 424 leaves, 14 steps):

$$\frac{7\left(b\,c-a\,d\right)\left(a+b\,x\right)^{5/6}\left(c+d\,x\right)^{1/6}}{12\,b^2}+\frac{\left(a+b\,x\right)^{5/6}\left(c+d\,x\right)^{7/6}}{2\,b}+$$
$$\frac{7\left(b\,c-a\,d\right)^2\,\text{ArcTan}\left[\frac{1}{\sqrt{3}}-\frac{2\,d^{1/6}\,(a+b\,x)^{1/6}}{\sqrt{3}\,b^{1/6}\,(c+d\,x)^{1/6}}\right]}{24\,\sqrt{3}\,b^{13/6}\,d^{5/6}}-\frac{7\left(b\,c-a\,d\right)^2\,\text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2\,d^{1/6}\,(a+b\,x)^{1/6}}{\sqrt{3}\,b^{1/6}\,(c+d\,x)^{1/6}}\right]}{24\,\sqrt{3}\,b^{13/6}\,d^{5/6}}+$$
$$\frac{7\left(b\,c-a\,d\right)^2\,\text{ArcTanh}\left[\frac{d^{1/6}\,(a+b\,x)^{1/6}}{b^{1/6}\,(c+d\,x)^{1/6}}\right]}{36\,b^{13/6}\,d^{5/6}}-\frac{7\left(b\,c-a\,d\right)^2\,\text{Log}\left[b^{1/3}+\frac{d^{1/3}\,(a+b\,x)^{1/3}}{(c+d\,x)^{1/3}}-\frac{b^{1/6}\,d^{1/6}\,(a+b\,x)^{1/6}}{(c+d\,x)^{1/6}}\right]}{144\,b^{13/6}\,d^{5/6}}+$$
$$\frac{7\left(b\,c-a\,d\right)^2\,\text{Log}\left[b^{1/3}+\frac{d^{1/3}\,(a+b\,x)^{1/3}}{(c+d\,x)^{1/3}}+\frac{b^{1/6}\,d^{1/6}\,(a+b\,x)^{1/6}}{(c+d\,x)^{1/6}}\right]}{144\,b^{13/6}\,d^{5/6}}$$

Result (type 5, 111 leaves):

$$\left((c+d\,x)^{1/6}\left(-d\,(a+b\,x)\,(-13\,b\,c+7\,a\,d-6\,b\,d\,x)+7\,(b\,c-a\,d)^2\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{1/6}\text{Hypergeometric2F1}\left[\frac{1}{6},\frac{1}{6},\frac{7}{6},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)\right)\Big/\left(12\,b^2\,d\,(a+b\,x)^{1/6}\right)$$

Problem 1806: Result unnecessarily involves higher level functions.

$$\int\frac{(c+d\,x)^{1/6}}{(a+b\,x)^{1/6}}\,dx$$

Optimal (type 3, 378 leaves, 13 steps):

$$\frac{(a+b\,x)^{5/6}\,(c+d\,x)^{1/6}}{b}+\frac{(b\,c-a\,d)\,\text{ArcTan}\left[\frac{1}{\sqrt{3}}-\frac{2\,d^{1/6}\,(a+b\,x)^{1/6}}{\sqrt{3}\,b^{1/6}\,(c+d\,x)^{1/6}}\right]}{2\,\sqrt{3}\,b^{7/6}\,d^{5/6}}-\frac{(b\,c-a\,d)\,\text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2\,d^{1/6}\,(a+b\,x)^{1/6}}{\sqrt{3}\,b^{1/6}\,(c+d\,x)^{1/6}}\right]}{2\,\sqrt{3}\,b^{7/6}\,d^{5/6}}+\frac{(b\,c-a\,d)\,\text{ArcTanh}\left[\frac{d^{1/6}\,(a+b\,x)^{1/6}}{b^{1/6}\,(c+d\,x)^{1/6}}\right]}{3\,b^{7/6}\,d^{5/6}}-\frac{(b\,c-a\,d)\,\text{Log}\left[b^{1/3}+\frac{d^{1/3}\,(a+b\,x)^{1/3}}{(c+d\,x)^{1/3}}-\frac{b^{1/6}\,d^{1/6}\,(a+b\,x)^{1/6}}{(c+d\,x)^{1/6}}\right]}{12\,b^{7/6}\,d^{5/6}}+\frac{(b\,c-a\,d)\,\text{Log}\left[b^{1/3}+\frac{d^{1/3}\,(a+b\,x)^{1/3}}{(c+d\,x)^{1/3}}+\frac{b^{1/6}\,d^{1/6}\,(a+b\,x)^{1/6}}{(c+d\,x)^{1/6}}\right]}{12\,b^{7/6}\,d^{5/6}}$$

Result (type 5, 90 leaves):

$$\frac{1}{b\,d\,(a+b\,x)^{1/6}}(c+d\,x)^{1/6}\left(d\,(a+b\,x)+(b\,c-a\,d)\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{1/6}\text{Hypergeometric2F1}\left[\frac{1}{6},\frac{1}{6},\frac{7}{6},\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)$$

Problem 1807: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(a+b\,x)^{1/6}\,(c+d\,x)^{5/6}}\,dx$$

Optimal (type 3, 309 leaves, 12 steps):

$$\frac{\sqrt{3}\,\text{ArcTan}\left[\frac{1}{\sqrt{3}}-\frac{2\,d^{1/6}\,(a+b\,x)^{1/6}}{\sqrt{3}\,b^{1/6}\,(c+d\,x)^{1/6}}\right]}{b^{1/6}\,d^{5/6}}-\frac{\sqrt{3}\,\text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2\,d^{1/6}\,(a+b\,x)^{1/6}}{\sqrt{3}\,b^{1/6}\,(c+d\,x)^{1/6}}\right]}{b^{1/6}\,d^{5/6}}+\frac{2\,\text{ArcTanh}\left[\frac{d^{1/6}\,(a+b\,x)^{1/6}}{b^{1/6}\,(c+d\,x)^{1/6}}\right]}{b^{1/6}\,d^{5/6}}-\frac{\text{Log}\left[b^{1/3}+\frac{d^{1/3}\,(a+b\,x)^{1/3}}{(c+d\,x)^{1/3}}-\frac{b^{1/6}\,d^{1/6}\,(a+b\,x)^{1/6}}{(c+d\,x)^{1/6}}\right]}{2\,b^{1/6}\,d^{5/6}}+\frac{\text{Log}\left[b^{1/3}+\frac{d^{1/3}\,(a+b\,x)^{1/3}}{(c+d\,x)^{1/3}}+\frac{b^{1/6}\,d^{1/6}\,(a+b\,x)^{1/6}}{(c+d\,x)^{1/6}}\right]}{2\,b^{1/6}\,d^{5/6}}$$

Result (type 5, 71 leaves):

$$\frac{6\left(\frac{d(a+b x)}{-b c+a d}\right)^{1/6}(c+d x)^{1/6}\,\text{Hypergeometric2F1}\left[\frac{1}{6},\frac{1}{6},\frac{7}{6},\frac{b(c+d x)}{b c-a d}\right]}{d(a+b x)^{1/6}}$$

Problem 1824: Result unnecessarily involves higher level functions.

$$\int\frac{(c+d x)^{11/6}}{(a+b x)^{5/6}}\,dx$$

Optimal (type 3, 424 leaves, 14 steps):

$$\frac{11(b c-a d)(a+b x)^{1/6}(c+d x)^{5/6}}{12 b^2}+\frac{(a+b x)^{1/6}(c+d x)^{11/6}}{2 b}-\frac{55(b c-a d)^2\,\text{ArcTan}\left[\frac{1}{\sqrt{3}}-\frac{2 d^{1/6}(a+b x)^{1/6}}{\sqrt{3}\,b^{1/6}(c+d x)^{1/6}}\right]}{24\sqrt{3}\,b^{17/6}d^{1/6}}+\frac{55(b c-a d)^2\,\text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2 d^{1/6}(a+b x)^{1/6}}{\sqrt{3}\,b^{1/6}(c+d x)^{1/6}}\right]}{24\sqrt{3}\,b^{17/6}d^{1/6}}+\frac{55(b c-a d)^2\,\text{ArcTanh}\left[\frac{d^{1/6}(a+b x)^{1/6}}{b^{1/6}(c+d x)^{1/6}}\right]}{36 b^{17/6}d^{1/6}}-\frac{55(b c-a d)^2\,\text{Log}\left[b^{1/3}+\frac{d^{1/3}(a+b x)^{1/3}}{(c+d x)^{1/3}}-\frac{b^{1/6}d^{1/6}(a+b x)^{1/6}}{(c+d x)^{1/6}}\right]}{144 b^{17/6}d^{1/6}}+\frac{55(b c-a d)^2\,\text{Log}\left[b^{1/3}+\frac{d^{1/3}(a+b x)^{1/3}}{(c+d x)^{1/3}}+\frac{b^{1/6}d^{1/6}(a+b x)^{1/6}}{(c+d x)^{1/6}}\right]}{144 b^{17/6}d^{1/6}}$$

Result (type 5, 111 leaves):

$$\left((c+d x)^{5/6}\left(-d(a+b x)(-17 b c+11 a d-6 b d x)+11(b c-a d)^2\left(\frac{d(a+b x)}{-b c+a d}\right)^{5/6}\text{Hypergeometric2F1}\left[\frac{5}{6},\frac{5}{6},\frac{11}{6},\frac{b(c+d x)}{b c-a d}\right]\right)\right)\Big/\left(12 b^2 d(a+b x)^{5/6}\right)$$

Problem 1825: Result unnecessarily involves higher level functions.

$$\int\frac{(c+d x)^{5/6}}{(a+b x)^{5/6}}\,dx$$

Optimal (type 3, 378 leaves, 13 steps):

$$\frac{(a+b x)^{1/6} (c+d x)^{5/6}}{b}-\frac{5 (b c-a d) \text{ArcTan}\left[\frac{1}{\sqrt{3}}-\frac{2 d^{1/6} (a+b x)^{1/6}}{\sqrt{3} b^{1/6} (c+d x)^{1/6}}\right]}{2 \sqrt{3} b^{11/6} d^{1/6}}+$$
$$\frac{5 (b c-a d) \text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2 d^{1/6} (a+b x)^{1/6}}{\sqrt{3} b^{1/6} (c+d x)^{1/6}}\right]}{2 \sqrt{3} b^{11/6} d^{1/6}}+\frac{5 (b c-a d) \text{ArcTanh}\left[\frac{d^{1/6} (a+b x)^{1/6}}{b^{1/6} (c+d x)^{1/6}}\right]}{3 b^{11/6} d^{1/6}}-$$
$$\frac{5 (b c-a d) \text{Log}\left[b^{1/3}+\frac{d^{1/3} (a+b x)^{1/3}}{(c+d x)^{1/3}}-\frac{b^{1/6} d^{1/6} (a+b x)^{1/6}}{(c+d x)^{1/6}}\right]}{12 b^{11/6} d^{1/6}}+$$
$$\frac{5 (b c-a d) \text{Log}\left[b^{1/3}+\frac{d^{1/3} (a+b x)^{1/3}}{(c+d x)^{1/3}}+\frac{b^{1/6} d^{1/6} (a+b x)^{1/6}}{(c+d x)^{1/6}}\right]}{12 b^{11/6} d^{1/6}}$$

Result (type 5, 90 leaves) :

$$\frac{1}{b d (a+b x)^{5/6}}$$
$$(c+d x)^{5/6}\left(d (a+b x)+(b c-a d)\left(\frac{d (a+b x)}{-b c+a d}\right)^{5/6} \text{Hypergeometric2F1}\left[\frac{5}{6},\frac{5}{6},\frac{11}{6},\frac{b (c+d x)}{b c-a d}\right]\right)$$

Problem 1826: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a+b x)^{5/6} (c+d x)^{1/6}}\, dx$$

Optimal (type 3, 309 leaves, 12 steps) :

$$-\frac{\sqrt{3} \text{ArcTan}\left[\frac{1}{\sqrt{3}}-\frac{2 d^{1/6} (a+b x)^{1/6}}{\sqrt{3} b^{1/6} (c+d x)^{1/6}}\right]}{b^{5/6} d^{1/6}}+\frac{\sqrt{3} \text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2 d^{1/6} (a+b x)^{1/6}}{\sqrt{3} b^{1/6} (c+d x)^{1/6}}\right]}{b^{5/6} d^{1/6}}+\frac{2 \text{ArcTanh}\left[\frac{d^{1/6} (a+b x)^{1/6}}{b^{1/6} (c+d x)^{1/6}}\right]}{b^{5/6} d^{1/6}}-$$
$$\frac{\text{Log}\left[b^{1/3}+\frac{d^{1/3} (a+b x)^{1/3}}{(c+d x)^{1/3}}-\frac{b^{1/6} d^{1/6} (a+b x)^{1/6}}{(c+d x)^{1/6}}\right]}{2 b^{5/6} d^{1/6}}+\frac{\text{Log}\left[b^{1/3}+\frac{d^{1/3} (a+b x)^{1/3}}{(c+d x)^{1/3}}+\frac{b^{1/6} d^{1/6} (a+b x)^{1/6}}{(c+d x)^{1/6}}\right]}{2 b^{5/6} d^{1/6}}$$

Result (type 5, 73 leaves) :

$$\frac{6 \left(\frac{d (a+b x)}{-b c+a d}\right)^{5/6} (c+d x)^{5/6} \text{Hypergeometric2F1}\left[\frac{5}{6},\frac{5}{6},\frac{11}{6},\frac{b (c+d x)}{b c-a d}\right]}{5 d (a+b x)^{5/6}}$$

Problem 1831: Result unnecessarily involves higher level functions.

$$\int \frac{(c+d x)^{13/6}}{(a+b x)^{7/6}}\, dx$$

Optimal (type 3, 449 leaves, 15 steps) :

$$\frac{91 d (b c-a d) (a+b x)^{5/6} (c+d x)^{1/6}}{12 b^3}+\frac{13 d (a+b x)^{5/6} (c+d x)^{7/6}}{2 b^2}-\frac{6 (c+d x)^{13/6}}{b (a+b x)^{1/6}}+\frac{91 d^{1/6} (b c-a d)^2 \text{ArcTan}\left[\frac{1}{\sqrt{3}}-\frac{2 d^{1/6} (a+b x)^{1/6}}{\sqrt{3} b^{1/6} (c+d x)^{1/6}}\right]}{24 \sqrt{3} b^{19/6}}-\frac{91 d^{1/6} (b c-a d)^2 \text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2 d^{1/6} (a+b x)^{1/6}}{\sqrt{3} b^{1/6} (c+d x)^{1/6}}\right]}{24 \sqrt{3} b^{19/6}}+\frac{91 d^{1/6} (b c-a d)^2 \text{ArcTanh}\left[\frac{d^{1/6} (a+b x)^{1/6}}{b^{1/6} (c+d x)^{1/6}}\right]}{36 b^{19/6}}-\frac{91 d^{1/6} (b c-a d)^2 \text{Log}\left[b^{1/3}+\frac{d^{1/3} (a+b x)^{1/3}}{(c+d x)^{1/3}}-\frac{b^{1/6} d^{1/6} (a+b x)^{1/6}}{(c+d x)^{1/6}}\right]}{144 b^{19/6}}+\frac{91 d^{1/6} (b c-a d)^2 \text{Log}\left[b^{1/3}+\frac{d^{1/3} (a+b x)^{1/3}}{(c+d x)^{1/3}}+\frac{b^{1/6} d^{1/6} (a+b x)^{1/6}}{(c+d x)^{1/6}}\right]}{144 b^{19/6}}$$

Result (type 5, 129 leaves) :

$$\frac{1}{12 b^3 (a+b x)^{1/6}}(c+d x)^{1/6} \left(-91 a^2 d^2-13 a b d (-13 c+d x)+b^2 \left(-72 c^2+25 c d x+6 d^2 x^2\right)+91 (b c-a d)^2 \left(\frac{d (a+b x)}{-b c+a d}\right)^{1/6} \text{Hypergeometric2F1}\left[\frac{1}{6},\frac{1}{6},\frac{7}{6},\frac{b (c+d x)}{b c-a d}\right]\right)$$

Problem 1832: Result unnecessarily involves higher level functions.

$$\int \frac{(c+d x)^{7/6}}{(a+b x)^{7/6}} \, dx$$

Optimal (type 3, 403 leaves, 14 steps) :

$$\frac{7 d (a+b x)^{5/6} (c+d x)^{1/6}}{b^2}-\frac{6 (c+d x)^{7/6}}{b (a+b x)^{1/6}}+\frac{7 d^{1/6} (b c-a d) \text{ArcTan}\left[\frac{1}{\sqrt{3}}-\frac{2 d^{1/6} (a+b x)^{1/6}}{\sqrt{3} b^{1/6} (c+d x)^{1/6}}\right]}{2 \sqrt{3} b^{13/6}}-\frac{7 d^{1/6} (b c-a d) \text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2 d^{1/6} (a+b x)^{1/6}}{\sqrt{3} b^{1/6} (c+d x)^{1/6}}\right]}{2 \sqrt{3} b^{13/6}}+\frac{7 d^{1/6} (b c-a d) \text{ArcTanh}\left[\frac{d^{1/6} (a+b x)^{1/6}}{b^{1/6} (c+d x)^{1/6}}\right]}{3 b^{13/6}}-\frac{7 d^{1/6} (b c-a d) \text{Log}\left[b^{1/3}+\frac{d^{1/3} (a+b x)^{1/3}}{(c+d x)^{1/3}}-\frac{b^{1/6} d^{1/6} (a+b x)^{1/6}}{(c+d x)^{1/6}}\right]}{12 b^{13/6}}+\frac{7 d^{1/6} (b c-a d) \text{Log}\left[b^{1/3}+\frac{d^{1/3} (a+b x)^{1/3}}{(c+d x)^{1/3}}+\frac{b^{1/6} d^{1/6} (a+b x)^{1/6}}{(c+d x)^{1/6}}\right]}{12 b^{13/6}}$$

Result (type 5, 93 leaves) :

$$\frac{1}{b^2 (a+b x)^{1/6}} (c+d x)^{1/6} \left(-6 b c+7 a d+b d x+7 (b c-a d) \left(\frac{d (a+b x)}{-b c+a d}\right)^{1/6} \text{Hypergeometric2F1}\left[\frac{1}{6},\frac{1}{6},\frac{7}{6},\frac{b (c+d x)}{b c-a d}\right]\right)$$

Problem 1833: Result unnecessarily involves higher level functions.

$$\int \frac{(c+d x)^{1/6}}{(a+b x)^{7/6}} \, dx$$

Optimal (type 3, 332 leaves, 13 steps):

$$-\frac{6 (c+d x)^{1/6}}{b (a+b x)^{1/6}}+\frac{\sqrt{3} d^{1/6} \text{ArcTan}\left[\frac{1}{\sqrt{3}}-\frac{2 d^{1/6} (a+b x)^{1/6}}{\sqrt{3} b^{1/6} (c+d x)^{1/6}}\right]}{b^{7/6}}-\frac{\sqrt{3} d^{1/6} \text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2 d^{1/6} (a+b x)^{1/6}}{\sqrt{3} b^{1/6} (c+d x)^{1/6}}\right]}{b^{7/6}}+\frac{2 d^{1/6} \text{ArcTanh}\left[\frac{d^{1/6} (a+b x)^{1/6}}{b^{1/6} (c+d x)^{1/6}}\right]}{b^{7/6}}-\frac{d^{1/6} \text{Log}\left[b^{1/3}+\frac{d^{1/3} (a+b x)^{1/3}}{(c+d x)^{1/3}}-\frac{b^{1/6} d^{1/6} (a+b x)^{1/6}}{(c+d x)^{1/6}}\right]}{2 b^{7/6}}+\frac{d^{1/6} \text{Log}\left[b^{1/3}+\frac{d^{1/3} (a+b x)^{1/3}}{(c+d x)^{1/3}}+\frac{b^{1/6} d^{1/6} (a+b x)^{1/6}}{(c+d x)^{1/6}}\right]}{2 b^{7/6}}$$

Result (type 5, 74 leaves):

$$\frac{1}{b (a+b x)^{1/6}} 6 (c+d x)^{1/6} \left(-1+\left(\frac{d (a+b x)}{-b c+a d}\right)^{1/6} \text{Hypergeometric2F1}\left[\frac{1}{6},\frac{1}{6},\frac{7}{6},\frac{b (c+d x)}{b c-a d}\right]\right)$$

Problem 1843: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{(a+b x)^{7/6} (c+d x)^{19/6}} \, dx$$

Optimal (type 5, 82 leaves, 2 steps):

$$-\frac{6 b^2 \left(\frac{b (c+d x)}{b c-a d}\right)^{1/6} \text{Hypergeometric2F1}\left[-\frac{1}{6},\frac{19}{6},\frac{5}{6},-\frac{d (a+b x)}{b c-a d}\right]}{(b c-a d)^3 (a+b x)^{1/6} (c+d x)^{1/6}}$$

Result (type 5, 179 leaves):

$$\left(-30 \left(a^3 d^3-a^2 b d^2 (5 c+2 d x)+a b^2 d \left(23 c^2+36 c d x+16 d^2 x^2\right)+b^3 \left(13 c^3+62 c^2 d x+80 c d^2 x^2+32 d^3 x^3\right)\right)+768 b^3 \left(\frac{d (a+b x)}{-b c+a d}\right)^{1/6} (c+d x)^3 \text{Hypergeometric2F1}\left[\frac{1}{6},\frac{5}{6},\frac{11}{6},\frac{b (c+d x)}{b c-a d}\right]\right) \Big/ \left(65 (b c-a d)^4 (a+b x)^{1/6} (c+d x)^{13/6}\right)$$

Problem 1850: Unable to integrate problem.

$$\int \frac{(a+b\,x)^m}{(c+d\,x)^2}\,dx$$

Optimal (type 5, 52 leaves, 1 step):

$$\frac{b\,(a+b\,x)^{1+m}\,\text{Hypergeometric2F1}\left[2,\,1+m,\,2+m,\,-\frac{d\,(a+b\,x)}{b\,c-a\,d}\right]}{(b\,c-a\,d)^2\,(1+m)}$$

Result (type 8, 17 leaves):

$$\int \frac{(a+b\,x)^m}{(c+d\,x)^2}\,dx$$

Problem 1851: Unable to integrate problem.

$$\int \frac{(a+b\,x)^m}{(c+d\,x)^3}\,dx$$

Optimal (type 5, 54 leaves, 1 step):

$$\frac{b^2\,(a+b\,x)^{1+m}\,\text{Hypergeometric2F1}\left[3,\,1+m,\,2+m,\,-\frac{d\,(a+b\,x)}{b\,c-a\,d}\right]}{(b\,c-a\,d)^3\,(1+m)}$$

Result (type 8, 17 leaves):

$$\int \frac{(a+b\,x)^m}{(c+d\,x)^3}\,dx$$

Problem 1857: Unable to integrate problem.

$$\int \frac{(c+d\,x)^n}{(a+b\,x)^2}\,dx$$

Optimal (type 5, 51 leaves, 1 step):

$$\frac{d\,(c+d\,x)^{1+n}\,\text{Hypergeometric2F1}\left[2,\,1+n,\,2+n,\,\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]}{(b\,c-a\,d)^2\,(1+n)}$$

Result (type 8, 17 leaves):

$$\int \frac{(c+d\,x)^n}{(a+b\,x)^2}\,dx$$

Problem 1858: Unable to integrate problem.

$$\int \frac{(c+d\,x)^n}{(a+b\,x)^3}\,dx$$

Optimal (type 5, 54 leaves, 1 step):

$$-\frac{d^2\,(c+d\,x)^{1+n}\,\text{Hypergeometric2F1}\left[3,\,1+n,\,2+n,\,\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]}{(b\,c-a\,d)^3\,(1+n)}$$

Result (type 8, 17 leaves):

$$\int \frac{(c+d\,x)^n}{(a+b\,x)^3}\,dx$$

Problem 1864: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int (a+b\,x)^{1+n}\,(c+d\,x)^{-n}\,dx$$

Optimal (type 5, 72 leaves, 2 steps):

$$\frac{1}{b\,(2+n)}\,(a+b\,x)^{2+n}\,(c+d\,x)^{-n}\,\left(\frac{b\,(c+d\,x)}{b\,c-a\,d}\right)^n\,\text{Hypergeometric2F1}\left[n,\,2+n,\,3+n,\,-\frac{d\,(a+b\,x)}{b\,c-a\,d}\right]$$

Result (type 6, 200 leaves):

$$a\,(a+b\,x)^n\,(c+d\,x)^{-n}\,\left(\left(3\,b\,c\,x^2\,\text{AppellF1}\left[2,\,-n,\,n,\,3,\,-\frac{b\,x}{a},\,-\frac{d\,x}{c}\right]\right)\Big/\left(6\,a\,c\,\text{AppellF1}\left[2,\,-n,\,n,\,3,\,-\frac{b\,x}{a},\,-\frac{d\,x}{c}\right]+2\,n\,x\left(b\,c\,\text{AppellF1}\left[3,\,1-n,\,n,\,4,\,-\frac{b\,x}{a},\,-\frac{d\,x}{c}\right]-a\,d\,\text{AppellF1}\left[3,\,-n,\,1+n,\,4,\,-\frac{b\,x}{a},\,-\frac{d\,x}{c}\right]\right)\right)-\frac{\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{-n}\,(c+d\,x)\,\text{Hypergeometric2F1}\left[1-n,\,-n,\,2-n,\,\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]}{d\,(-1+n)}\right)$$

Problem 1865: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int (a+b\,x)^{2+n}\,(c+d\,x)^{-n}\,dx$$

Optimal (type 5, 72 leaves, 2 steps):

$$\frac{1}{b\,(3+n)}\,(a+b\,x)^{3+n}\,(c+d\,x)^{-n}\,\left(\frac{b\,(c+d\,x)}{b\,c-a\,d}\right)^n\,\text{Hypergeometric2F1}\left[n,\,3+n,\,4+n,\,-\frac{d\,(a+b\,x)}{b\,c-a\,d}\right]$$

Result (type 6, 317 leaves):

$$a\,(a+b\,x)^n\,(c+d\,x)^{-n}\left(\left(3\,a\,b\,c\,x^2\,\text{AppellF1}\left[2,\,-n,\,n,\,3,\,-\frac{b\,x}{a},\,-\frac{d\,x}{c}\right]\right)\Big/\left(3\,a\,c\,\text{AppellF1}\left[2,\,-n,\,n,\,3,\,-\frac{b\,x}{a},\,-\frac{d\,x}{c}\right]+n\,x\left(b\,c\,\text{AppellF1}\left[3,\,1-n,\,n,\,4,\,-\frac{b\,x}{a},\,-\frac{d\,x}{c}\right]-a\,d\,\text{AppellF1}\left[3,\,-n,\,1+n,\,4,\,-\frac{b\,x}{a},\,-\frac{d\,x}{c}\right]\right)\right)+\left(4\,b^2\,c\,x^3\,\text{AppellF1}\left[3,\,-n,\,n,\,4,\,-\frac{b\,x}{a},\,-\frac{d\,x}{c}\right]\right)\Big/\left(12\,a\,c\,\text{AppellF1}\left[3,\,-n,\,n,\,4,\,-\frac{b\,x}{a},\,-\frac{d\,x}{c}\right]+3\,b\,c\,n\,x\,\text{AppellF1}\left[4,\,1-n,\,n,\,5,\,-\frac{b\,x}{a},\,-\frac{d\,x}{c}\right]-3\,a\,d\,n\,x\,\text{AppellF1}\left[4,\,-n,\,1+n,\,5,\,-\frac{b\,x}{a},\,-\frac{d\,x}{c}\right]\right)-\frac{1}{d\,(-1+n)}\,a\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{-n}(c+d\,x)\,\text{Hypergeometric2F1}\left[1-n,\,-n,\,2-n,\,\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]\right)$$

Problem 1882: Result unnecessarily involves higher level functions.

$$\int (a+b\,x)^m\,\left(a\,c\,(1+m)+b\,c\,(2+m)\,x\right)^{-3-m}\,dx$$

Optimal (type 3, 95 leaves, 2 steps):

$$-\frac{(a+b\,x)^{1+m}\,\left(a\,c\,(1+m)+b\,c\,(2+m)\,x\right)^{-2-m}}{a\,b\,c\,(2+m)}+\frac{(a+b\,x)^{1+m}\,\left(a\,c\,(1+m)+b\,c\,(2+m)\,x\right)^{-1-m}}{a^2\,b\,c^2\,(1+m)\,(2+m)}$$

Result (type 5, 82 leaves):

$$-\frac{1}{a^3\,b\,c^3\,(1+m)}(a+b\,x)^{1+m}\,\left(c\,\left(a\,(1+m)+b\,(2+m)\,x\right)\right)^{-m}\left(-1-m-\frac{b\,(2+m)\,x}{a}\right)^m\,\text{Hypergeometric2F1}\left[1+m,\,3+m,\,2+m,\,\frac{(2+m)\,(a+b\,x)}{a}\right]$$

Problem 1884: Result unnecessarily involves higher level functions.

$$\int (a+b\,x)^{\frac{-2\,b\,c+a\,d}{b\,c-a\,d}}\,(c+d\,x)^{\frac{b\,c-2\,a\,d}{-b\,c+a\,d}}\,dx$$

Optimal (type 3, 97 leaves, 2 steps):

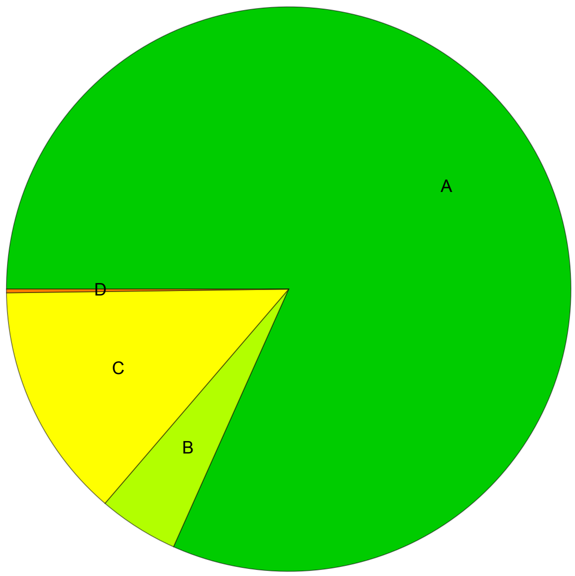
$$-\frac{(a+b\,x)^{-\frac{b\,c}{b\,c-a\,d}}\,(c+d\,x)^{\frac{a\,d}{b\,c-a\,d}}}{b\,c}+\frac{(a+b\,x)^{-\frac{a\,d}{b\,c-a\,d}}\,(c+d\,x)^{\frac{a\,d}{b\,c-a\,d}}}{a\,b\,c}$$

Result (type 5, 159 leaves):

$$\frac{1}{a\,d^2}(b\,c-a\,d)\,(a+b\,x)^{\frac{-2\,b\,c+a\,d}{b\,c-a\,d}}\left(\frac{d\,(a+b\,x)}{-b\,c+a\,d}\right)^{\frac{-2\,b\,c+a\,d}{-b\,c+a\,d}}(c+d\,x)^{\frac{a\,d}{b\,c-a\,d}}\,\text{Hypergeometric2F1}\left[\frac{a\,d}{b\,c-a\,d},\,\frac{-2\,b\,c+a\,d}{-b\,c+a\,d},\,\frac{b\,c}{b\,c-a\,d},\,\frac{b\,(c+d\,x)}{b\,c-a\,d}\right]$$

Summary of Integration Test Results

1917 integration problems



A - 1566 optimal antiderivatives

B - 88 more than twice size of optimal antiderivatives

C - 259 unnecessarily complex antiderivatives

D - 4 unable to integrate problems

E - 0 integration timeouts